Environmental Licensing Programme

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Environmental Protection Agency

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31/07/2023

UÉ ref: LT0668

Dear Inspector,

Re: Youghal Wastewater Discharge Licence Application D0139-03

In response to the Regulation 18(3)(b) request for information notice dated 30th September 2021, please see below for relevant information;

Submit an Environmental Impact Assessment Report, in accordance with Regulation 17 of the European Union (Waste Water Discharge) Regulations 2007 to 2020.

Please find attached Volumes 1 and 2 of the Environmental Impact Assessment Report to support the Youghal Wastewater Discharge Licence (WWDL) review application D0139-03.

Yours sincerely

Peter Keegan

Peter Keegan
Wastewater Strategy

Enclosed: Appendix 1: EIAR Volume 1 and 2.

Appendix 1: Youghal WWDL Review Application (D0139-03) EIAR – Volumes 1 and 2

ATKINS

Member of the SNC-Lavalin Group

Youghal Wastewater Discharge Licence (Reg. No. D0139-03)

Environmental Impact Assessment Report Volume 1 – Non-Technical Summary

Uisce Éireann

July 2023

Notice

This document and its contents have been prepared and are intended solely as information for Uisce Éireann and use in relation to the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall location at Youghal Wastewater Treatment Plant under Discharge Licence (Reg. No. D0139-03).

WS Atkins Ireland Limited assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

This document has 26 pages including the cover.

Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev 0	Final	JL	JL	KL/DL	DL	31/07/2023

Client signoff

Client	Uisce Éireann
Project	The proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall location at Youghal Wastewater Treatment Plant under Discharge Licence (Reg. No. D0139-03).
Job number	5204549
Client signature / date	

Table of Contents

1. Introduction & Methodology

Uisce Éireann (UÉ) are applying to the Environmental Protection Agency (EPA) for consent for the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall at Youghal Wastewater Treatment Plant (WwTP) under Wastewater Discharge Licence (WwDL) Reg. No. D0139-03[1] in Co. Cork in accordance with Regulation 17 of the Waste Water Discharge (Authorisation) Regulations 2007, as amended.

This non-technical summary presents a general overview of the project and an assessment of all associated potential environmental impacts. Refer also to the Environmental Impact Assessment Report (EIAR) submitted as part of submission. The EIAR is presented in three volumes as follows;

Volume 1 - Non-Technical Summary (this document);

Volume 2- EIAR; and

Volume 3- EIAR Appendices.

Introduction

The proposed use of Dunn's Park discharge outfall as a permanent discharge outfall is hereafter also referred to as 'the Site', or the 'project. The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01[2]. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater M[3] Estuary / Youghal Harbour.

The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WwTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. The Environmental Impact Assessment Report (EIAR) has been prepared based on the fact that the design capacity of 16,000 population equivalent (P.E) will not change.

There are no physical changes occurring with Dunn's Park discharge outfall and there are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur.

The licence review / EIAR is for the existing design capacity of 16,000 P.E. Dunn's Park discharge outfall has capacity to meet the maximum design discharge from 16,000 P.E. The collected load in 2021 was 11,338 P.E. as per UÉ 2021 Annual Environmental Report.

The site is located ca. 1.3km north of the town centre, in an area called the Mudlands. The site is bounded to the north by mudlands and greenfields, to the east by mudlands and the Lower Blackwater Estuary and to the south and west by mudlands, greenfields and residential properties. The site is primarily zoned as '*YL-GC-06 (Green Conservation')* in the Cork County Development Plan 2022-2028, which states that:

'This area, consisting predominantly of woodland and agricultural land, forms an important visual part of the setting to Youghal particularly when seen from the north. The site forms part of a significant ecological green infrastructure corridor adjoining the estuary and supports wetland habitats including salt marshes, reed beds, marshes and lagoons. The existing pattern of land uses will remain largely unchanged. Parts of this area are important for overwintering wetland birds associated with the estuary. There may be opportunities for biodiversity enhancement of this area which should be encouraged' (Cork County Council (CCC), 2022).

A small section of the project site is zoned as '*Existing residential/mixed residential and other uses'*. Section 18.3.5 of the Plan states that '*These areas generally have a primary or strong residential component but which also provide for non-residential uses which protect and improve the primary use of these areas'* (CCC, 2022).

Background

Prior to the commissioning of the WwTP, wastewater from Youghal was untreated, and was discharged through a primary outfall located at Dunn's Park, which was constructed at some point in the 1970s. There were also two secondary outfalls, six storm water overflows and one emergency overflow.

In 2001, Youghal Urban District Council (UDC) prepared a "Main Drainage Scheme" (UDC Scheme), which proposed construction of the WwTP to treat wastewater from Youghal. The UDC Scheme envisaged that the primary outfall of treated effluent from the WwTP into the Blackwater estuary would be via a new outfall pipe emerging into a deep trench at Ferry Point. The UDC Scheme also intended that the existing outfalls at Dunn's Park, Paxes Lane, Foxhole and The Strand would remain as stormwater overflows or emergency overflows (in other words, those outfalls would only emit discharges on an intermittent basis).

[1] Applied for on the 18/06/2021 (https://epawebapp.epa.ie/terminalfour/wwda/wwda-view.jsp?regno=D0139-03)
[2] WwDL Reg No. D0139-02 has been withdrawn
[3] M denotes Munster

An Bord Pleanála certified that the UDC Scheme would not have significant adverse effects on the environment on 20th of March 2002 and was granted consent.

In 2008, prior to commencement of construction of the then-proposed WwTP, CCC applied to the EPA for a WwDL. The WwDL application outlined the following:

- Discharges of untreated wastewater at Dunn's Park would continue until the WwTP was commissioned;
- On commissioning of the WwTP, the primary outfall for discharges of treated effluent would be relocated to Ferry Point; and
- The remaining outfalls were to be rationalised.

The EPA granted the WwDL (Reg No. D0139-01) on the 13th of June 2012, with conditions. The conditions provided that discharges of untreated wastewater could continue from Dunn's Park until 31st December 2015. Following that point, the primary outfall for discharges of treated wastewater was to be relocated to Ferry Point. The WwDL presupposed that UÉ would commission both the WwTP and the new Ferry Point outfall at the same time. Construction of the WwTP was completed in November 2017 and commissioned on 8th of December 2017. Dunn's Park then became the primary discharge point for treated effluent from the WwTP, pending commissioning of the Ferry Point outfall. Ferry Point outfall has not been constructed.

Environmental Impact Assessment Report (EIAR)

This EIAR has been prepared in accordance with European Union (Environmental Impact Assessment Directive (2011/92/EU as amended by 2014/52/EU) and European Union (Planning and Development) (Environmental Impact Assessment) Regulations and with due regard to the following EIAR guidance;

- Environmental Protection Agency (EPA) 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports', published in 2022;
- EPA 'Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)', published in September 2003;
- EPA 'Guidelines on the information to be contained in Environmental Impact Statements', published in 2002,
- European Commission (EC) 'Environmental Impact Assessment of Projects Guidance on Scoping (Directive 2011/92/EU as amended by 2014/52/EU)', published in 2017;
- EC 'Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU)', published in 2017; and,
- Department of Housing, Local Government and Heritage (DoHPLG) 'Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment', published in August 2018.

Additionally, discipline specific best practice guidance has been consulted by each specialist for each of the topics (Population & Human Health; Biodiversity; Landscape and Visual; Air Quality, Odour & Climate; Noise & Vibration; Traffic; Land, Soils & Geology; Water; Cultural Heritage; and, Material Assets) during the preparation of the EIAR.

Within the main body of the EIAR (Volume 2), Chapter 1 sets out the introduction and methodology, Chapter 2 describes the project and identifies the information required in an EIAR.

The environmental topics where there is potential for significant effects to arise or if topics or subtopics are scoped out are addressed in Chapters 3 to 12 as follows;

- Chapter 3 Landscape and Visual;
- Chapter 4 Air Quality, Odour & Climate;
- Chapter 5 Noise & Vibration;
- Chapter 6 Land, Soils & Geology;
- Chapter 7 Traffic;
- Chapter 8 Cultural Heritage;
- Chapter 9 Population and Human Health;
- Chapter 10 Biodiversity;
- Chapter 11 Water; and,
- Chapter 12 Material Assets.

Culmulative Impacts for all relevant disciplines are addressed in Chapter 13 (Volume 2 – EIAR), Interactions between disciplines are addressed in Chapter 14 (Volume 2 – EIAR) and the Schedule of Environmental Commitments are presented within Chapter 15 of the EIAR (refer to Chapter 15, Volume 2 – EIAR).

The EIAR has been prepared by competent experts. As part of the assessment process, an environmental scoping exercise was carried out in accordance with Regulation 17C of the European Union (Waste Water Discharge) Regulations 2007 to 2020. The purpose of the exercise was to define the scope of the EIAR. UÉ requested the EPA to provide its opinion in writing on the scope and level of detail of the information required to be included in the EIAR. The EIA Scoping Report was issued to the EPA, who circulated the EIA scoping report to relevant statutory organisations as part of the assessment process, as detailed further in Section 2.5 within the EIAR (Volume 2).

It is concluded that the operation of the project does not pose a risk with regard to potential radiation effects, as no existing plant / equipment on site contains or emits radiation. Therefore, potential radiation effects do not warrant consideration within this EIAR.

There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP, hence there are no changes to the operational phase of the WwTP and Dunn's Park outfall pipe.

All relevant comments from the various consultees and the EPA (received 02/02/2022) have been fully addressed as required within the EIAR (Volume 2).

2. Project Description

Details of Project

The project is for the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall at Youghal WwTP under Discharge Licence (Reg. No. D0139-03) in Co. Cork.

There are no physical changes occurring with Dunn's Park discharge outfall and there are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The existing WwDL (D0139-01) relates to the maximum design capacity of 16,000 population equivalent (P.E) which will not be altered or changed as part of this EIAR.

The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WwTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP, hence no changes to the operational phase of the WwTP and Dunn's Park outfall pipe will occur.

Refer to Figure 2-1 for the Youghal Agglomeration Boundary. Refer to Figure 2-2 for the outline of Youghal Wastewater Treatment Plant and Dunn's Park discharge outfall. The selected study area for the project depends on each environmental topic. Different subject matter experts may require a wider study area depending on their assessment / walkovers, to ensure a robust assessment for their particular environmental topic.

Description of Baseline Scenario

The baseline scenario including a description of the relevant aspects of the current receiving environment has been considered and included in the EIAR through the collection and collation of baseline data including analytical data where relevant (noise levels). A detailed description of the current receiving environment is presented in relevant sections for each environmental topic within the EIAR (Volume 2).

Consideration of Alternatives

Potential alternatives to the project have been considered at length within this submission and are summarised in Volume 2 – EIAR Chapter 2 of the submission.

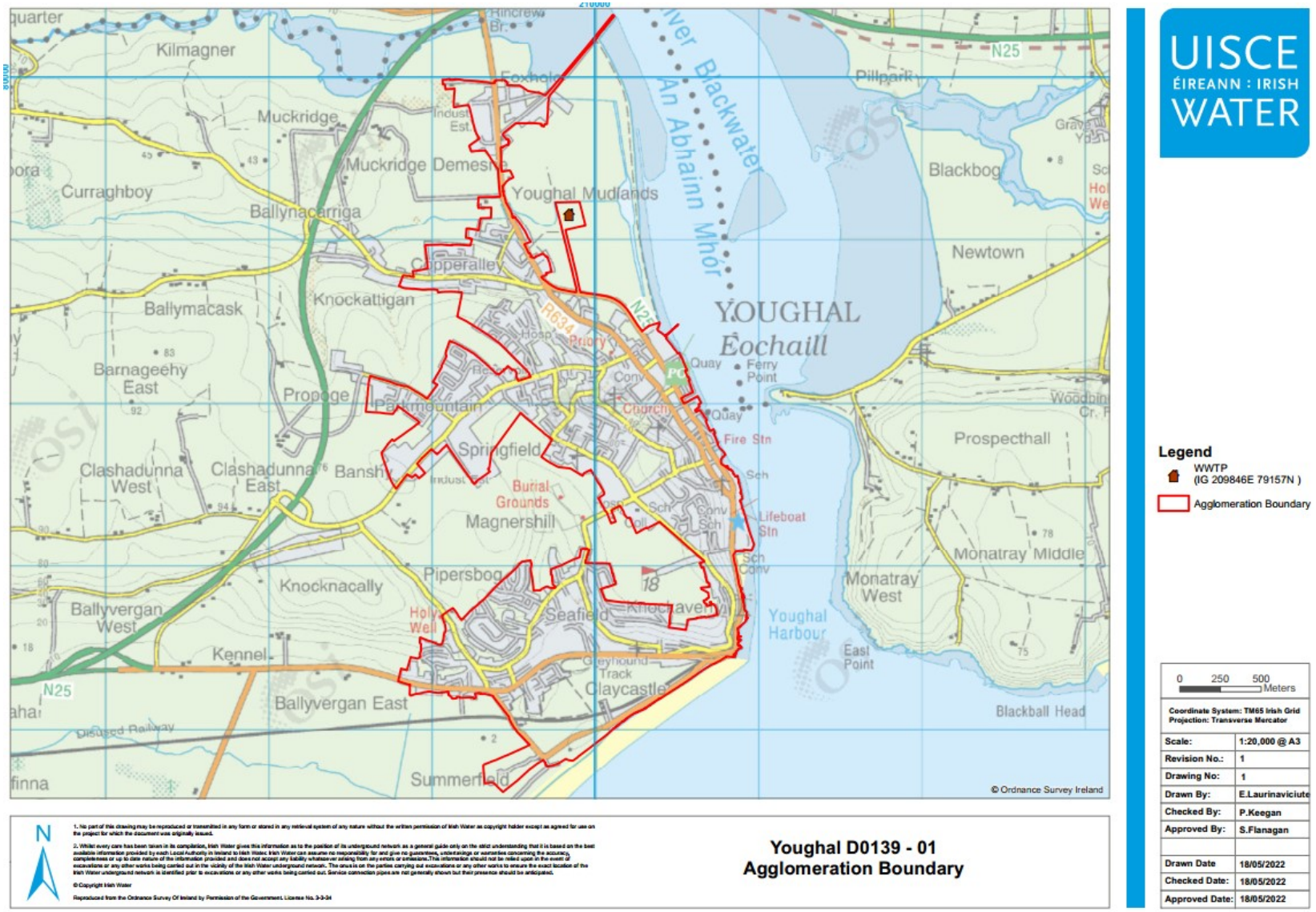
Consideration of Cumulative Effects with other Projects

Consideration of cumulative effects with other projects were undertaken. All relevant developments in the immediate environs of the project, which have been approved or operational, have been reviewed in terms of potential cumulative environmental impacts that may arise with the project.

Cumulative impacts were identified by each specialist as part of their respective assessments (refer to Chapter 13 of Volume 2 - EIAR) and considered further as part of the EIAR. No significant cumulative effects arising from the project are anticipated.

Risk of Major Accidents and/or Disasters

The potential risk posed by a major accident and/or disaster has been considered. Based on the location and nature of the project to such risk, and the unlikely potential occurrence of such an incident, the overall risk is considered to be low.



Youghal D0139 - 01
Agglomeration Boundary

UISCE ÉIREANN : IRISH WATER

Legend
- WWTP (IG 209846E 79157N)
- Agglomeration Boundary

0 250 500 Meters

Coordinate System: TM65 Irish Grid
Projection: Transverse Mercator

Scale:	1:20,000 @ A3
Revision No.:	1
Drawing No:	1
Drawn By:	E.Laurinaviciute
Checked By:	P.Keegan
Approved By:	S.Flanagan
Drawn Date	18/05/2022
Checked Date:	18/05/2022
Approved Date:	18/05/2022

Figure 2-1 – Youghal Agglomeration Boundary

Figure 2.2 – Location of Dunn's Park Discharge Outfall

3. Landscape and Visual

This section summarises the effects of the project on landscape and visual receptors, and the significance of the effects identified. The extent of the study area extends to 500m from the centre of the outfall location as it enters the River Blackwater Estuary.

Receiving Environment –Landscape

The Study Area lies within an area defined by the Draft Landscape Strategy as 'Youghal Bay', of landscape character type 2: Broad Bay Coast.

The Study Area straddles the coastline extending both inland and towards the centre of the Lower Blackwater M Estuary. On the landward side, the area is predominantly urban and highly varied in character and quality, incorporating the northern fringe of Youghal including central urban waterfront, a small industrial estate, mid-twentieth century suburb, a retail park and open countryside. The immediate environs of the development project areas are dominated by industrial features including the concrete seawall, security fencing and hard standing. The foreshore is comprised of a shallow shingle beach sloping to a sandy shelf. The discharge pipe crosses this beach perpendicular to the shoreline, sloping gradually into the water.

The site and Study Area lie within a 'High Value Landscape' as designated by the County Cork development plan. This is derived from the Draft Landscape Strategy 2007.

Immediately south of the site, the Youghal Conservation Area encompasses the town centre and the shoreline. The development is sufficiently distant from the Architectural Conservation Area (ACA), that it does not affect the setting of the ACA.

Within the County Development Plan, a designation of stretches of road as 'Scenic Routes' is defined. These are routes from which the views are considered to be worthy of protection from inappropriate development. The nearest of these to the site lie 1.25km to the north-west of the site and 2.25km from the project. Given that there will be no changes to the WwTP and the small scale of the area where the outfall is visible as it enters the estuary, any visual effects upon this scenic route are judged to be negligible to non-existent.

Landscape Effects

Since the project is already in place, no construction activities are required. Hence there would be no construction related landscape and visual effects from the project.

The effect of the project is to retain the existing outfall pipeline for permanent use. As the project already is an element of the local landscape character, there would be no change to existing landscape character or landscape elements as a result of the project. The area where the outfall pipeline is visible already includes infrastructure including the concrete seawall, security fencing, warehousing and industrial machinery. It is therefore judged that the local landscape has **low** sensitivity to the project as it is already an element characteristic of its location.

The geographical extent over which the outfall pipe is perceptible will not change and stay limited to the area where it enters the estuary and the shoreline route near the immediate setting of the outfall. Therefore, the magnitude of change to landscape character is judged to be **no change.**

The combination of low sensitivity and no change magnitude suggests the significance of the effects on landscape character within the study area during the operational phase is judged to be **neutral** and **long term.**

Receiving Environment - Visual

The only other element of the project which is visible includes the section of outfall pipe that is visible as it enters the River Lower Blackwater M Estuary and the length of this pipe that is visible up to it greatest extent at low tide. Sections of pipe that are underground or below the water level at low tide would not lead to any visual effects. The extent of visibility is restricted to the shoreline route running north from Youghal, with the outfall pipe being partially visible except at high tide.

The visual receptors identified include people in boats on the adjacent estuary, and people (both residents, visitors and outdoor workers) walking along the shoreline route north from Youghal including, Green's Quay and the coastal path at Dunn's Park.

Following desktop and field survey, 4 viewpoints were selected to represent the experience of different types of visual receptor. The viewpoints chosen do not cover every view but have been selected to represent the different users from a range of directions and distances from the site.

Visual Effects

Since the project is already in place, no construction activities are required. Hence there would be no construction related landscape and visual effects from the project.

The significance of the visual effect of the operation phase of the project was judged as neutral from all 4 viewpoints.

4. Quality, Odour and Climate

The potential air quality, odour and climate effects on the surrounding environment that require consideration for a project of this type includes two distinct stages, the construction phase and the operational phase.

The WwTP is located in Youghal Co. Cork ca.1.3 km north from the centre of town and the nearest private residence is located 170m west to southwest of the site. The study area includes all areas that could potentially be affected by the emissions from the project.

The dominant influences on air quality in the area are emissions from traffic. Other sources such as commercial energy and heating sources, and domestic heating also influence air quality. The main substances which are of interest in terms of existing air quality are sulphur dioxide, nitrogen oxides (nitric oxide, NO and nitrogen dioxide NO2, collectively referred to as NOx), fine particulate matter including PM10 and PM2.5 which could originate from combustion sources, traffic and odour from existing site activities, and the nearby EPA licenced facilities in the area. Carbon monoxide is also potentially of interest, and benzene may also be of interest from traffic sources.

Construction Phase Effects

There is no demolition, construction or decommissioning works associated with the project so there are therefore no construction phase effects.

Operation Phase Effects

There will be no change in the nature or quantity of emissions as a result of the project

The operational phase activities will have a not significant impact on local air quality and will be long-term in duration.

Air Quality and Climate Effects

There are negligible levels of emissions of greenhouse gases such as carbon dioxide, nitrous oxide and methane associated with the project and the low traffic levels associated with the project.

The emissions associated with the project are considered imperceptible, their effect on climate can also be regarded as imperceptible

Odour Effects

There will be no change to the characteristics of the emissions from any stage of the treatment process as a result of the project. Therefore, there is no change in odour effect predicted as a result of the project. The impact of the project will be neutral, imperceptible and long term.

Cumulative Effect Assessment

The most relevant nearby sites are the Waste Transfer Station (Licence Reg W0211-02) and Youghal Landfill(Licence Reg W0068-03). These sites are located north of the site and have the potential to emit odour. These sites are mainly downwind of the WwTP and at a distance which is unlikely to lead to measurable cumulative impacts.

There will be no significant adverse air quality, climate, or odour impacts on the environment as a result of the project or in conjunction with other local developments that are planned for the area.

Mitigation Measures

The project is for the proposed use of Dunn's Park as a permanent discharge location outfall. The project does not involve any new works since it relates only to continuing the existing discharge outfall. The existing monitoring occurring onsite as part of the existing WwDL licence (Reg No. D0139-01) at the WwTP demonstrates a non-odorous final effluent at the discharge point, thereby demonstrating that any existing mitigation measures are effective.

Residual Effects

The comprehensive mitigation and management existing at the WwTP will ensure that there are no significant residual effects. The residual effects of the project will be neutral, imperceptible and long term.

5. Noise & Vibration

Chapter 5 assesses the potential noise and vibration effects associated with the proposed use of temporary discharge outfall, Dunn's Park, as a permanent discharge outfall from Youghal WwTP in Co. Cork. The study has been undertaken using the following methodology:

- A review of relevant guidance and standards has been undertaken to identify appropriate noise and vibration criteria relevant to the existing facility to assess against best practice guidance;
- An environmental noise survey was undertaken to characterise the prevailing noise environment at the closest noise sensitive locations (NSLs) to the existing WwTP and Dunn's Park discharge outfall to establish the contribution, if any, of the existing operation to the ambient noise environment;
- An assessment of operational noise levels against the appropriate identified criteria and existing noise levels has been undertaken; and,
- An assessment of the potential noise and vibration impacts of the continued operations has been undertaken alongside any potential cumulative impacts with surrounding planned or permitted developments in place.

Receiving Environment

The existing environment surrounding the Youghal WwTP and Dunn's Park discharge outfall is semi-urban in nature comprising a mixture of local and national roads, residential areas and commercial and industrial facilities. The prevailing noise environment was surveyed adjacent to the WwTP facility and Dunn's Park discharge outfall and in proximity to NSLs in the surrounding environment. There was no audible noise contribution from the WwTP facility at the nearest NSLs. There was no audible noise associated with Dunn's Park discharge outfall at the adjacent measurement location. The noise environment was noted to be dominated by road traffic from the surrounding road network and environmental sources including birdsong and leaf rustle. The operation of the WwTP and the discharge outfall, therefore, do not contribute to any notable noise levels to the NSLs in their vicinity and comply with standard guidelines that would typically apply for noise in their surrounding environments.

Potential Effects

Construction Phase

There is no demolition, construction or decommission phases associated with the proposed project. Youghal WwTP is currently using the Dunn's Park discharge outfall as a temporary discharge location. Therefore there are no potential noise or vibration effects in this case as there is no construction taking place.

Operational Phase

The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WwTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP, hence no changes to the noise environment from the existing WwTP facility will occur.

Operational noise levels associated with the existing WwTP and Dunn's Park discharge outfall do not contribute to the prevailing noise environment at the closest NSLs. Operational noise levels associated with the existing WwTP and Dunn's Park discharge are well below noise limits values that would be typically applied to similar licenced facilities.

In summary, there is no change to the noise environment associated with the project (i.e. proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall), hence the effect of continued operation when compared to existing conditions is neutral, imperceptible and long term.

6. Land, Soils and Geology

Receiving Environment

This chapter describes the type of land, soils and geology likely to be encountered beneath and in the general area of the project. The project entails the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall location.

Land use at the Site has generally been transformed over the years from vacant area of slob lands and regular fields, where the lands was reclaimed in the 19th century to agricultural land.

The topography of the surrounding area generally falls from west to east, towards the Blackwater Estuary / Youghal Harbour. The topography of the site ranges between 0m and 5m above ordnance datum (mOD) (OSI, 2023)[4].

According to the GSI public data viewer (GSI, 2023), the primary superficial / quaternary sediments underlying the vicinity of the Site include marine beach sands (Mbs) in the north and urban (made ground) in the south. (GSI, 2023).

Construction Land, Soils & Geology Effects

Youghal WwTP is currently using the Dunn's Park discharge outfall as a temporary discharge location. There are no demolition, construction, or decommissioning phases as part of the project, hence there is no proposed works, no land take or ground excavation occurring. Therefore there are no associated effects.

Operational Land, Soils & Geology Effects

The project will have a neutral effect on land as no land take is required for the project. There will be no change in overall use of the WwTP lands. There is no evidence of soil contamination at the project. There will be no effects with regards to land (including land take), soils or geology during the operational phase, based on the nature, location and scale of the project.

The project is for the use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall. There will be no changes to the current operation phase or WwTP process of the WwTP hence there will be no changes to the discharge at Dunn's Park and therefore there will be no effects with regards to the land, soils and geology predicted. Hence effects are neutral, imperceptible and long-term

Conclusion

There are no predicted effects on the land, soils and geology, hence no mitigation measures are required.

[4] https://webapps.geohive.ie/mapviewer/index.html

7. Traffic

Receiving Environment

The project is the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall. There is no demolition, construction or decommission phases associated with the project. Youghal WwTP is currently using the Dunn's Park discharge outfall as a temporary discharge location.

Access to the existing WwTP is provided off the R634. This access will be retained for the project. The cross-section and access point are shown in Plate 7.1 below. The section of R634 road between the access point to WwTP and the outfall pipe location is approximately 750 meters in length.

The receiving environment was reviewed, and it was found that the existing plant traffic was as follows:

- Sludge Truck – 1 truck per week, which will attribute to 2 round trips per week;
- Non-sludge Truck - 1 truck per week, which will attribute to 2 round trips per week; and,
- Employee Trips – 1 employee per day which will attribute to 2 trips per day.

Construction Effects

As a result of there being no construction phase, no effects are expected on the local road network.

Operational Effects

As the operation of the plant would not change as a result of the project, the anticipated impact on the operation phase is anticipated to be neutral, imperceptible and long-term.

Conclusion

There are no predicted effects on the traffic, as a result, no mitigation measures or monitoring are required.

8. Cultural Heritage

This chapter presents an assessment of the proposed use of the temporary discharge outfall Dunn's Park (SW000) as a permanent discharge outfall on the cultural heritage resource. Youghal WwTP is currently using the existing outfall as a temporary discharge location and there will be no demolition, construction or decommissioning phases associated with the project.

The assessment was based on a desktop study of the cultural heritage environment within a study area that encompasses the project location and the lands extending for 50m from its boundary and this was followed by a site inspection of the project location and its environs. Based on the results of these studies the chapter then presents an assessment of predicted effects and conclusions in relation to the need for any mitigation measures.

The project is located within the townland of Youghal Mudlands in the northern outskirts of Youghal town and at its nearest point is ca. 150m outside the extent of the medieval walled town. It is contained within a former area of slob lands which was reclaimed from the western side of the harbour during the middle of the 19th century and was then developed as an area of vacant agricultural grassland during subsequent decades.

There are no recorded archaeological sites located within the boundary of the project, which is also outside the Zone of Archaeological Potential around the historic core of Youghal town. The nearest recorded archaeological site to the project is a 19th century gasworks (CO067-031----) located 120m to the south of the section of the outfall route extending along the R634 road. The site of a Dominican Friary (CO067-030002-) is located 180m to the west of the nearest section of the outfall route and this location also contains the former site of a church (CO067-061----) and an existing graveyard (CO067-030001-).

A review of the National Monuments Service Wreck Viewer revealed that there are no recorded shipwrecks located within the environs of the Dunn's Park discharge outfall. A review of the Database of Irish Excavation Reports revealed that it contains no records of any archaeological investigations associated with the construction of the WwTP or discharge outfall. The Database contains two entries describing archaeological investigations within the environs of the project and neither of these revealed nothing of archaeological significance. In addition, a review of the National Museum of Ireland's Topographical File archive revealed that it does not contain any records for the discovery of archaeological objects within the townland of Youghal Mudlands.

The project is located outside the Youghal Architectural Conservation Area as mapped in the County Cork Development Plan 2022-2028. The Record of Protected Structures published in this development plan lists one example within the study area, and this comprises a boundary wall constructed in 1845 to delimit the east side of the reclaimed slob lands (RPS ref. 2728). The wall is also listed in the National Inventory of Architectural Heritage (NIAH ref. 20823004) which assigns it a regional ranking. This wall remains extant in the waterfront area to the north of the existing outfall. The detail on the first edition 6-inch OS map (1842) shows the project location as part of a vacant area of slob lands and no structures are shown within its boundary. The detail on the 25-edition OS map (published 1905) shows the area occupied by regular, vacant fields following the completion of the 19th century reclamation works.

It is concluded that the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall will have a neutral, imperceptible, long-term effect on the cultural heritage resource and, therefore, no mitigation measures are required.

9. Population and Human Health

Receiving Environment

This chapter assesses the likely significant effects of the project on the Population and Human Health setting in the general area of Dunn's Park discharge outfall at Youghal WwTP in Co. Cork.

The site is located ca. 1.3km north of the town centre, in an area called the Mudlands. The site is bounded to the north by mudlands and greenfields, to the east by mudlands and the Lower Blackwater Estuary and to the south and west by mudlands, greenfields and residential properties. The site is primarily zoned as '*YL-GC-06 (Green Conservation')* in the Cork County Development Plan 2022-2028. A small section of the project site is zoned as '*Existing residential/mixed residential and other uses'* (CCC, 2022).

Given the nature of the project it is considered the key study areas are the 'Local Area' (comprised of Youghal Rural (Cork) and Youghal Urban (Cork) EDs and the County Area (consisting of Cork County Council). There has been a consistently high level of population growth within the state and County Cork over this period, with this growth anticipated to continue in the future. There has also been significant population growth between 2011 and 2016 in Youghal Urban (Cork) with a growth of 11%, and a significant decrease (-74%) in population growth in the Youghal Rural (Cork) between 2011 and 2016.

Construction Effects

There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. Therefore there are no associated effects.

Operation Effects

The existing WwTP is an established use, as is the existing Dunn's Park temporary discharge outfall.

The potential likely significant operational effects on human health were assessed from different environmental assessment, as follows:

- Chapter 4 – Air Quality, Odour and Climate;
- Chapter 5 – Noise and Vibration;
- Chapter 6 – Soils, Geology and Land;
- Chapter 11 – Water; and,
- AECOM (2023) Youghal Wastewater Treatment Works Marine Modelling Study Addendum (Refer to Appendix 11.1).

The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WwTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. The effect is neutral, imperceptible, and long term on land use, age profile, economic profile and tourism and amenities.

There are no potential likely significant effects on human health associated with the operation phase. As a result of the above assessments and that there are no valid source-pathway-receptor linkages. As the above assessment (AECOM, 2023) confirm there is no significant effects on the receptors; '*Based on the findings above it is concluded that the Youghal WwTP, operating at the design capacity of 16 000PE and discharging through the Dunn's Park outfall, will not adversely impact.*

- *The current WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies.*
- *The bathing water quality at the beaches (Youghal Front Strand and Claycastle).*
- *The water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay'* (AECOM, 2023).

Conclusion

There are no required mitigation or monitoring measures associated with the project. There will be no residual effects with regards to Population and Human Health.

10. Biodiversity

This biodiversity chapter identifies and evaluates potential effects of the proposed permanent use of the Dunn's Park discharge outfall on non-European protected sites, habitats, species, and ecosystems. It considers impacts to ecological receptors and considered whether measures are required to offset or reduce any identified impacts. A Natura Impact Statement (NIS) has been prepared by Uisce Éireann (2023) for the project. Refer to Volume 3 - Appendix 10.1.

Dunn's Park outfall is located within the Blackwater River (Cork/Waterford) SAC (002170), the Blackwater Estuary SPA (004028), while land-based aspects of the project (such as the WwTP, pipes etc.) are not; these elements range in distance of 0m to 415m from the boundaries of aforementioned European sites. Dunn's Park outfall pipe is within the Blackwater River and Estuary pNHA (000072); the balance of the project is not within the pNHA.

No ecological features of regional, national or European importance will be impacted by the project. The lands within the project are dominated by habitats of low ecological value, such as built land (BL3), amenity grassland (GA2), and areas of recolonizing bare ground (ED2/ED3). No rare plant species were recorded within the project area. No invasive species listed on the 3rd Schedule of Natural Habitats Regulations, 2011 (SI 477 of 2011) were recorded within the project area; nor were there any signs of protected mammal species, such as Badger (*Meles meles*).

There are no watercourses on site; the Muckridge Stream is located north of the WwTP. This along with a number of drains which cross under the access road to the WwTP ultimately discharge to the lagoon to the east, (this is within Blackwater River (Cork/Waterford) SAC). However, no works are proposed to any of these watercourses, nor will there be any alteration to the existing pattern of surface water drainage from the WwTP or from the access road.

There are no changes required to the existing infrastructure to facilitate the project, therefore no clearance of vegetation, no demolition, construction, or decommissioning phases will occur. While group such as bats were considered in the desktop assessment, the need for a targeted bat survey (or indeed a breeding bird survey) was therefore scoped out as there is no pathway by which such groups might be affected by permanent use of the Dunn's Park discharge outfall. Wintering shorebirds are considered in the accompanying NIS. Refer to Volume 3 - Appendix 10.1.

The potential impacts associated with WwTP discharges is related to Biological Oxygen Demand (BOD), nutrient and bacteriological loading; these will not impact upon terrestrial habitats or species. A model of the discharge based on these parameters was carried out by AECOM (2023) on behalf of Uisce Éireann. The model found that the discharge would not adversely impact on the Water Framework Directive status, bathing water quality or aquaculture sites within Youghal Harbour or Youghal Bay. As such there will be no impact on marine mammals or on estuarine habitats or species as there is no predicted impact on water quality (see EIAR Volume 2 - Chapter 11 - Water Chapter). Potential impacts on qualifying interests of European sites are considered in the accompanying NIS (Uisce Éireann, 2023).No mitigation measures for biodiversity are required.

11. Water

This chapter describes the existing surface water and groundwater setting likely to be encountered within the vicinity of the project. The project comprises the use of Dunn's Park discharge outfall as the primary outfall for Youghal WwTP, on a permanent basis. Potential impacts on hydrology (i.e. surface water) and hydrogeology (i.e. groundwater) have been assessed in accordance with relevant best practice guidance. In addition, a Marine Modelling Study (AECOM, 2019 - 2023) has been prepared with the aim of assessing the discharges of treated wastewater from the Youghal WwTP to the tidal River Blackwater. A flood risk assessment has also been undertaken for the project; however no unacceptable risk of flooding from or to the project has been identified.

The site comprises the Youghal WwTP (operational from 2018), greenfield lands on the edge of Youghal estuary. The topography of the site ranges between 0m and 5m above ordnance datum (mOD). The site is generally bounded by greenfield lands, used primarily for grazing, and is immediately bounded by Muckridge Stream, and a minor field drain. The nearest designated European Sites are: Blackwater River (Cork / Waterford) SAC (Ref: 002170); Blackwater Estuary SPA (Ref: (004028); and, Blackwater River and Estuary pNHA (Ref: 000072). Dunn's Park discharge outfalls into the Blackwater River and Estuary, and directly into these designated European Sites. there are 4no. EPA licenced facilities within 5km of the Site. The main potential contamination source offsite is Youghal Landfill Facility, located ca. 1.5km north (and upstream) of Dunn's Park outfall pipe.

The River Muckridge flows through the northern region of the site into the Lower Blackwater Estuary/Youghal Harbour, which flows into Youghal Bay. The East Ballyvergan river is located ca. 200m south of the site and discharges into Youghal Harbour ca. 550m south west of this point. There are no audited geological heritage sites within 500m of the site. The River Muckridge has been assigned a 'moderate' river water quality status by the EPA for the 2016 to 2021 monitoring period, while the status of the East Ballyvergan river is assigned as 'good' for the same monitoring period. The Lower Blackwater Estuary/Youghal Harbour waterbody is classified as having 'moderate' transitional waterbody status. Youghal Bay, the coastal waterbody south of site has been assigned a 'moderate' water quality status for the same period.

The EPA maintains a record of locations and water quality values collected for the National Water Monitoring by the EPA and Local Authorities. A review of available surface water quality data has been undertaken for two key sample locations as follows:

- EPA Monitoring Station: TW31003144BR2012 – located upstream of Dunn's Park discharge point; and,
- EPA Monitoring Station: TW31003144BR2013 - located downstream of Dunn's Park discharge point.

For the purposes of the baseline assessment a review of key surface water parameters (Ammonia, BOD and Orthophosphate) for a six year period (2016 – 2022) was undertaken.

Accounting for seasonal changes and natural variation of the water quality in Youghal Bay transitional waters, no significant effects on receiving water quality at the upstream monitoring location, with respect to Ammonia and BOD, were observed as a result of discharge via. Dunn's Park discharge point (which commenced in 2018). A general increasing (fluctuating), trend in average annual ortho-phosphate (as P) concentrations is noted at the upstream monitoring location. However the source is unlikely to be Dunn's Park discharge. Rather it is likely to be due to an identified offsite contamination source, Youghal landfill.

No significant effects on receiving water quality at the downstream monitoring location, were observed as a result of the ongoing operation of discharge via. Dunn's Park discharge point. There was no observed net negative effect on baseline water quality downstream of Dunn's Park discharge point, since the WwTP commenced operations in 2018 throughout the monitoring period to 2022.

Groundwater vulnerability is an indication of how easily the aquifer can become contaminated by human activity. It is dependent on the thickness and permeability of the overlying soils and depth to the water table. Groundwater vulnerability (in the bedrock aquifer) beneath the site ranges between 'High(H)' to 'Moderate(M)'. The vulnerability within the Youghal Agglomeration is predominantly 'High(H)' to 'Extreme(E)' with some areas of 'Rock at or Near Surface'.

The GSI has devised a system for classifying bedrock aquifers and gravel aquifers in Ireland based on the size and hydrogeological characteristics of these aquifers. The bedrock aquifer beneath the site is generally classified as Poor (which is generally unproductive except for local zone), with the northern portion underlain by a Locally Important Karstified bedrock aquifer. Average recharge of the locally important bedrock aquifer beneath the site ranges between ca. 100 to 400 mm/yr.

The soil deposits underlying the site comprise soft thinly laminated organic silts and very silty clays with frequent thin sand layers and layers of partially decomposed organic material overlying dense gravel. Based on site specific data, these dense gravels were encountered at depths of 9.2m and 14m beneath the site, and depth increases towards the harbour. The gravel layer is saturated, with groundwater encountered within these deposits, rising to ground level during the historic site investigation. Groundwater is likely to be encountered at the same depth as the gravel deposits beneath the site i.e. at depths of ca. 9mbgl and deeper. Groundwater flow is likely to follow topography in an easterly direction before discharging to Youghal Estuary / Harbour. The GSI maintains a record of groundwater abstractions consisting of wells and springs, in addition to designated drinking water protection zones (referred to as Source Protection Areas). Based on the GSI database, there are no public water supply or group water scheme abstraction points, or source protection areas, beneath or adjacent to the site. Regional groundwater quality status (2016 to 2021) is classified under the WFD as 'Good' beneath the site.

There are no demolition, construction or decommissioning phases associated with the project. Therefore there are no associated effects. During the operational phase of the project, there could be a potential impact on receiving surface water / transitional water quality, which could result in the following effects on identified potential receptors:

- Surface waters:
  - The River Muckridge located adjacent to the site;
  - The East Ballyvergan river, located downstream of the site.
- Bathing Waters (coastal waters):
  - Youghal Front Strand Beach, located downstream of the site;
  - Youghal Claycastle located downstream of the site,
  - Redbarn located downstream of the site.
- Shellfish Waters:
  - Ballymacoda Bay.
  - Nutrient Sensitive Waters:
  - Lower Blackwater M Estuary / Youghal Harbour transitional waters.
- Designated European Sites:
  - Blackwater River (Cork / Waterford) SAC (Ref: 002170);
  - Blackwater Estuary SPA (Ref: (004028); and,
  - Blackwater River and Estuary pNHA (Ref: 000072).

The potential impact from the UÉ discharge location at Dunn's Park has been evaluated at the design capacity of the Youghal WwTP. The modelling assessment (AECOM, 2023) has been prepared specifically to assess key potential impacts, from SWOs (including emergency overflows) on sensitive receptors. The modelling assessment (AECOM, 2023) concluded that the Youghal WwTP, operating at the design capacity of 16,000PE and discharging through the Dunn's Park outfall, will not have a significant effect on:

- The current Water Framework Directive status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies.
- The bathing water quality at the beaches (Youghal Front Strand and Claycastle).
- The water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay.

The conclusions from the detailed modelling report are verified by monitoring data for key indicator parameters at monitoring locations upstream and downstream of the site. Accordingly likely effects (with respect to water quality impacts) to key identified receptors will be not significant.

In summary, the project will not result in any negative effects to the existing hydrogeological regime of the area. The residual effect to surface water / transitional water quality resulting from the use of the Dunn's Park discharge outfall as the primary outfall, on a permanent basis, will be negative, not significant and long-term.

Effects (with respect to water quality impacts) are likely to be not significant, and long-term, with regards to the following identified receptors;

- The River Muckridge or the East Ballyvergan river;
- Lower Blackwater M Estuary and Youghal Harbour transitional waterbodies;
- Identified Bathing waters at Youghal Front Strand Beach, Youghal Claycastle and Redbarn;
- Identified Shellfish Waters at Ballymacoda Bay, the SPFA Classified Production area in Youghal Bay; or the aquaculture sites within Youghal Harbour and Youghal Bay; and,
- Designated European Sites: Blackwater River (Cork / Waterford) SAC (Ref: 002170); Blackwater Estuary SPA (Ref: (004028); and Blackwater River and Estuary pNHA (Ref: 000072).

Therefore, no significant negative effects are likely to occur within the receiving water environment arising from the project during the operational phase. The project will not be likely to cause a deterioration in surface / transitional / coastal water or groundwater status or compromise the ability of any identified waterbodies to comply with the objectives of the Water Framework Directive.

No significant effects to receiving surface waters / transitional / coastal waters or groundwater are likely as a result of the project.

No mitigation measures associated with the operational phase of the project are required. Standard measures / monitoring requirements will be adhered to during the operational phase.

12. Material Assets

Receiving Environment

According to relevant EPA guidance (EPA, 2022) the following topics warrant consideration under material assets:

- Built Services;
- Roads and Traffic; and
- Waste Management.

Roads and traffic have been assessed separately as part of this EIAR. Refer to Chapter 7 – Traffic. Therefore, this chapter identifies describes and assesses the likely significant effects on material assets serving the project specifically in relation to existing and proposed built services (i.e., foul sewerage, surface water drainage, water supply, gas, electricity, and telecommunications utilities), and waste management; both of which are assessed separately within this section.

There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. On this basis, there are no potential effects of the existing built services and waste management in the vicinity associated with any construction phase and hence this phase has been scoped out of further assessment.

Built Services

Construction Effects

Youghal WwTP is currently using the Dunn's Park discharge outfall as a temporary discharge location. There are no demolition, construction or decommissioning phases as part of the project and characteristics of the project are as existing, therefore no changes are required to the existing built services / utilities to facilitate the project. Therefore there are no associated effects.

Operational Effects

There will be no changes to the existing built services / utilities as part of the operation phase of the project. Hence the effect is neutral, imperceptible and long term. There will be no likely significant effects regarding built services during the operational phase.

Waste

Construction Effects

Youghal WwTP is currently using the Dunn's Park discharge outfall as a temporary discharge location. There are no demolition, construction or decommissioning phases as part of the project, hence there is no proposed works, and no waste will be generated. Therefore there are no associated effects.

Operation Effects

Youghal WwTP has a design capacity of 16,000 P.E and Dunn's Park discharge outfall has capacity to meet the maximum design discharge of 16,000 P.E. There are ca. 1-2 vehicle movement per week for sludge and 1 vehicle movement per week for non-sludge and one operator per day. This equates to 1 to 2 vehicles per week accessing the site and one car per day entering and exiting the site during the operation phase. There will be no changes to the design or process of the current WwTP or Dunn's Park outfall pipe. The project is currently discharging the final treated effluent at Dunn's Park discharge outfall which is currently operational as a temporary discharge location. This application is seeking consent to make the discharge outfall, Dunn's Park, permanent for the final effluent at the current location; (210464E 78504N).

Currently during the operational phase the treated effluent is discharging via Dunn's Park discharge outfall to the Blackwater Estuary, which gives rise to waste. There will be no changes to the existing WwTP process, operations and/or discharge hence there will be no change to the discharge at Dunn's Park.

The site is currently operating as per the requirements of the existing Wastewater Discharge Licence (EPA Ref: D0139-01) and will continue to operate to the conditions of the reviewed licence. The existing infrastructure within the WwTP and the existing Dunn's Park outfall infrastructure have already been constructed and are currently operating and are maintained in accordance with all UÉ requirements and standard best practice guidelines.

There are no changes to the current operations of the site, hence the effect is neutral, imperceptible and long term. There will be no likely significant effects regarding waste during the operational phase.

No mitigation measures or monitoring for material assets are required.

13. Cumulative Impacts

This chapter assesses the potential for the project to act in combination with committed developments, consented projects, granted / approved developments, and projects applied for relevant consents, and licensed and permitted projects within the vicinity to result in cumulative impacts on the environment.

A summary of all committed development in the immediate environs of the project, which have been approved by CCC and an Bord Pleanála (ABP) within the last 5 years have been reviewed as part of the preparation of this EIAR. The majority of these developments have already been constructed or are of small scale in nature (i.e. extension works, or property retention works) or are considered to be a reasonable distance from the project and do not warrant further consideration as part of this assessment.

EPA licenced facilities within 5km of the project have been reviewed as part of the preparation of this EIAR.

A review has also been carried out of any relevant discharge licences and aquaculture licences (applied for relevant consents, permits and / or licences, and licensed and permitted projects).

Based on a review of planning records, EPA licenced facilities, relevant discharge licences, aquaculture licences and applying for consent licences a list of committed developments has been compiled (and is presented in Chapter 13, Volume 2 EIAR) which require further consideration in relation to potential cumulative effects with the project, as part of this assessment.

In summary no likely significant effects have been identified as a result of potential cumulative effects between effects identified in the technical chapters of the EIAR and other committed developments.

Furthermore, in all cases such interactions are unlikely to occur.

No significant cumulative effects are likely to arise from the project.

14. Interactions

This section describes interactions between effects on various environmental factors. A summary matrix showing interdependencies between these environmental attributes is presented below for the project.

	Chapter 3 – Landscape and Visual		Chapter 4 – Air Quality, Odour and Climate		Chapter 5 – Noise and Vibration		Chapter 6 – Land, Soil and Geology		Chapter 7 - Traffic		Chapter 8 - Cultural Heritage		Chapter 9 – Population and Human Health		Chapter 10 - Biodiversity		Chapter 11 - Water		Chapter 12 - Material Assets	
	Con.	*Op.*	*Con.*	*Op.*	*Con.*	*Op.*	*Con.*	*Op.*	*Con.*	*Op.*	*Con.*	*Op.*	*Con.*	*Op.*	*Con.*	*Op.*	*Con.*	*Op.*	*Con.*	*Op.*
Chapter 3 – Landscape and Visual			×	×	×	×	×	×	×	×	×	✓	×	×	×	✓	×	×	×	×
Chapter 4 – Air Quality, Odour and Climate					×	×	×	×	×	✓	×	×	×	✓	×	✓	×	×	×	×
Chapter 5 – Noise and Vibration	×	×	×	×			×	×	×	✓	×	×	×	✓	×	✓	×	×	×	×
Chapter 6 – Land, Soil and Geology	×	×	×	×	×	×			×	×	×	×	×	✓	×	×	×	✓	×	×
Chapter 7 - Traffic	×	×	×	✓	×	✓	×	×			×	×	×	✓	×	×	×	×	×	×
Chapter 8 - Cultural Heritage	×	×	×	×	×	×	×	×	×	×			×	×	×	×	×	×	×	×
Chapter 9 – Population and Human Health	×	×	×	✓	×	✓	×	✓	×	✓	×	×			×	×	×	✓	×	✓
Chapter 10 - Biodiversity	×	✓	×	✓	×	✓	×	×	×	×	×	×	×	×			×	✓	×	×
Chapter 11 - Water	×	×	×	×	×	×	×	✓	×	×	×	×	×	✓	×	✓			×	×
Chapter 12 - Material Assets	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×		

All potential interactions have been addressed as required throughout the EIAR. During each stage of the assessment contributors have liaised with each other (where relevant) to ensure that all such potential interactions have been addressed.

The various interactions between environmental topics considered within the EIAR are further discussed in Chapter 14, Volume 2 – EIAR.

15. Schedule of Environmental Commitments

A schedule of environmental commitments has been prepared, for ease of reference and clarity, and to facilitate enforcement of all environmental mitigation and monitoring measures during the operation phase.

These are presented in Chapter 15, Volume 2 - EIAR.

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ATKINS

Member of the SNC-Lavalin Group

Youghal Wastewater Discharge Licence (Reg. No. D0139-03)

Environmental Impact Assessment Report Volume 2 – EIAR

Uisce Éireann

July 2023

Notice

This document and its contents have been prepared and are intended solely as information for Uisce Éireann and use in relation to the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall location at Youghal Wastewater Treatment Plant under Discharge Licence (Reg. No. D0139-03).

WS Atkins Ireland Limited assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

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Rev 0	Working Draft	JL	JL	DL	DL	16/03/2023
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Client signoff

Client	Uisce Éireann
Project	The proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall location at Youghal Wastewater Treatment Plant under Discharge Licence (Reg. No. D0139-03).
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Client signature / date	

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1. Introduction & Methodology

1.1. Introduction

Uisce Éireann (UÉ) are applying to the Environmental Protection Agency (EPA) for consent for the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall for Youghal Wastewater Treatment Plant (WwTP) under Wastewater Discharge Licence (WwDL) Reg. No. D0139-03[1] in Co. Cork in accordance with Regulation 17 of the Waste Water Discharge (Authorisation) Regulations 2007, as amended.

The proposed use of Dunn's Park discharge outfall as a permanent discharge outfall is hereafter also referred to as 'the Site', or the 'project'. The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01[2]. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater M[3] Estuary / Youghal Harbour, which is a Special Protected Area (SPA) (Site Code: 004028), Special Area of Conservation (SAC) (002170) and proposed National Heritage Area (pNHA) (000072).

The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WwTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. The Environmental Impact Assessment Report (EIAR) has been prepared based on the fact that the design capacity of 16,000 population equivalent (P.E) will not change.

There are no physical changes occurring with Dunn's Park discharge outfall and there are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur.

The licence review / EIAR is for the existing design capacity of 16,000 P.E. Dunn's Park discharge outfall has capacity to meet the maximum design discharge of 16,000 P.E. The collected load in 2021 was 11,338 P.E. as per UÉ 2021 Annual Environmental Report.

The site is located ca. 1.3 km north of the town centre, in an area called the Mudlands. The site is bounded to the north by mudlands and greenfields, to the east by mudlands and the Lower Blackwater M Estuary and to the south and west by mudlands, greenfields and residential properties. The site is primarily zoned as '*YL-GC-06 (Green Conservation')* in the Cork County Development Plan 2022-2028, which states that:

'This area, consisting predominantly of woodland and agricultural land, forms an important visual part of the setting to Youghal particularly when seen from the north. The site forms part of a significant ecological green infrastructure corridor adjoining the estuary and supports wetland habitats including salt marshes, reed beds, marshes and lagoons. The existing pattern of land uses will remain largely unchanged. Parts of this area are important for overwintering wetland birds associated with the estuary. There may be opportunities for biodiversity enhancement of this area which should be encouraged' (Cork County Council (CCC), 2022).

A small section of the project site is zoned as '*Existing residential/mixed residential and other uses'*. Section 18.3.5 of the Plan states that '*These areas generally have a primary or strong residential component, but which also provide for non-residential uses which protect and improve the primary use of these areas'* (CCC, 2022).

Refer to Figure 1-1 for the location of Dunn's Park discharge outfall.

[1] Applied for on the 18/06/2021 (https://epawebapp.epa.ie/terminalfour/wwda/wwda-view.jsp?regno=D0139-03)
[2] WwDL Reg No. D0139-02 has been withdrawn
[3] M denotes Munster

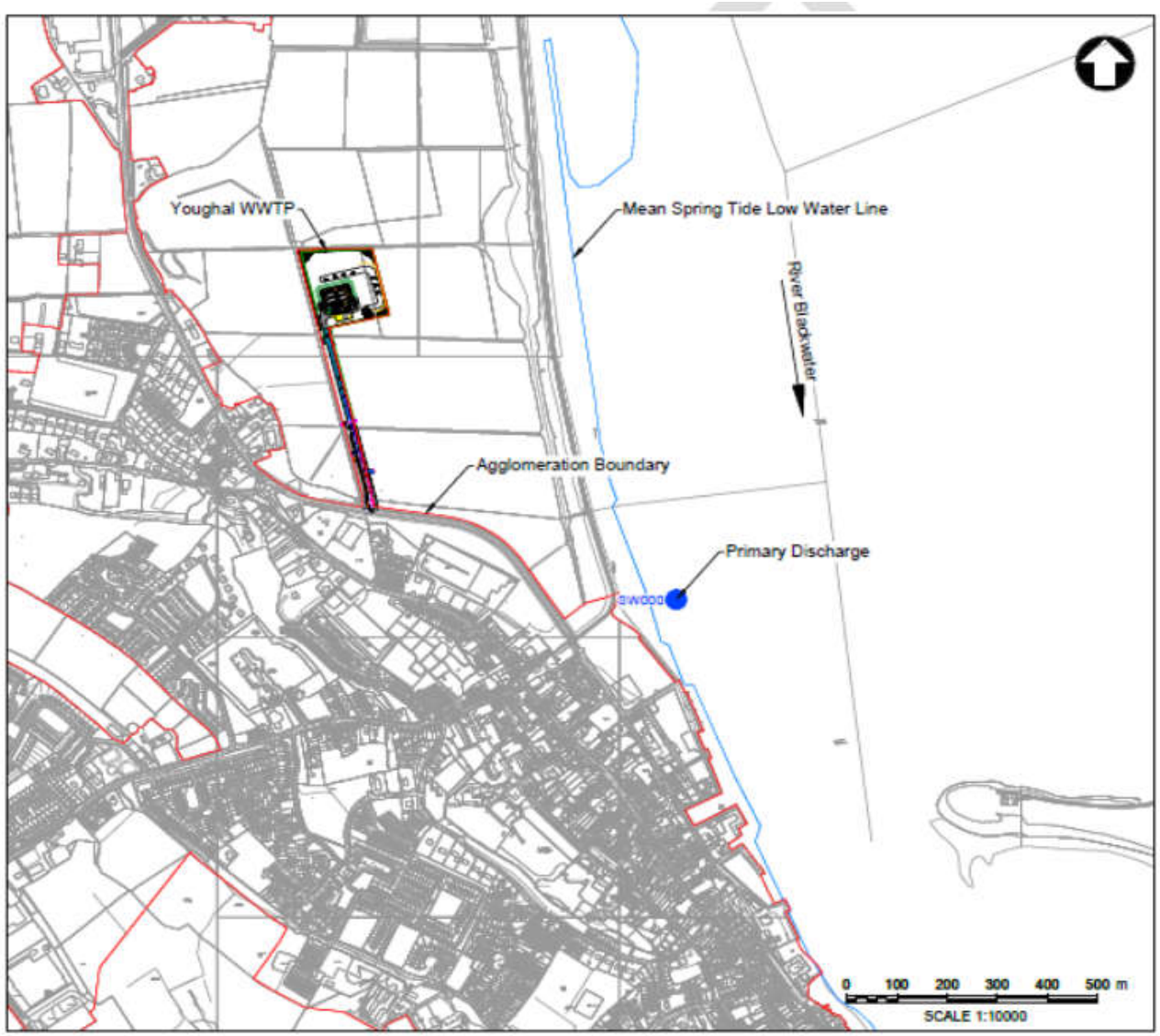


Figure 1.1 – Location of Dunn's Park Discharge Outfall (SW000)

1.2. Background

Prior to the commissioning of the WwTP, wastewater from Youghal was untreated, and was discharged through a primary outfall located at Dunn's Park, which was constructed at some point in the 1970s. There were also two secondary outfalls, six storm water overflows and one emergency overflow.

In 2001, Youghal Urban District Council (UDC) prepared a "Main Drainage Scheme" (UDC Scheme), which proposed construction of the WwTP to treat wastewater from Youghal. The UDC Scheme envisaged that the primary outfall of treated effluent from the WwTP into the Blackwater estuary would be via a new outfall pipe emerging into a deep trench at Ferry Point. The UDC Scheme also intended that the existing outfalls at Dunn's Park, Paxes Lane, Foxhole and The Strand would remain as stormwater overflows or emergency overflows (in other words, those outfalls would only emit discharges on an intermittent basis).

An Bord Pleanála certified that the UDC Scheme would not have significant adverse effects on the environment on 20th of March 2002 and was granted consent.

In 2008, prior to commencement of construction of the then-proposed WwTP, CCC applied to the EPA for a WwDL. The WwDL application outlined the following:

- Discharges of untreated wastewater at Dunn's Park would continue until the WwTP was commissioned;
- On commissioning of the WwTP, the primary outfall for discharges of treated effluent would be relocated to Ferry Point; and
- The remaining outfalls were to be rationalised.

The EPA granted the WwDL (Reg No. D0139-01) on the 13th of June 2012, with conditions. The conditions provided that discharges of untreated wastewater could continue from Dunn's Park until 31st December 2015. Following that point, the primary outfall for discharges of treated wastewater was to be relocated to Ferry Point. The WwDL presupposed that UÉ would commission both the WwTP and the new Ferry Point outfall at the same time. Construction of the WwTP was completed in November 2017 and commissioned on 8th of December 2017. Dunn's Park then became the primary discharge point for treated effluent from the WwTP, pending commissioning of the Ferry Point outfall. Ferry Point outfall has not been constructed.

1.3. Need for the EIAR

UÉ are seeking to authorise the use of the temporary discharge outfall, Dunn's Park, as the primary outfall, on a permanent basis.

UÉ have submitted a licence review (Reg No. D0139-03)[4] of the existing WwDL (Reg No. D0139-01) for the Youghal Agglomeration in accordance with regulation 14(1)(b) of the European Union (Waste Water Discharge) Regulations 2007- 2020 to the EPA.

The project involves a wastewater discharge licence application from a wastewater treatment plant with a capacity of greater than 10,000 population equivalents.

Therefore, a mandatory Environmental Impact Assessment Report (EIAR) is required for this particular project, as per Regulation 17 of the relevant European Union (Wastewater Discharge) Regulations 2007- 2020.

1.4. Legislation and Guidance

This EIAR has been prepared in accordance with European Union (Environmental Impact Assessment Directive (2011/92/EU as amended by 2014/52/EU) and European Union (Planning and Development) (Environmental Impact Assessment) Regulations and with due regard to the following EIAR guidance:

- Environmental Protection Agency (EPA) 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports', published in 2022;
- EPA 'Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)', published in September 2003;
- EPA 'Guidelines on the information to be contained in Environmental Impact Statements', published in 2002,
- European Commission (EC) 'Environmental Impact Assessment of Projects Guidance on Scoping (Directive 2011/92/EU as amended by 2014/52/EU)', published in 2017;
- EC 'Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU)', published in 2017; and,

[4] Applied for on the 18/06/2021 (https://epawebapp.epa.ie/terminalfour/wwda/wwda-view.jsp?regno=D0139-03)

- Department of Housing, Local Government and Heritage (DoHPLG) 'Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment', published in August 2018.

Additionally, discipline specific best practice guidance has been consulted by each specialist for each of the topics (Population & Human Health; Biodiversity; Landscape and Visual; Air Quality, Odour & Climate; Noise & Vibration; Traffic; Land, Soils & Geology; Water; Cultural Heritage; and Material Assets) during the preparation of the EIAR.

1.5. Structure of this Report

This EIAR includes all necessary technical studies to address the likely environmental effects of the project. The disciplines identified for inclusion in this EIAR, along with the technical content, were determined based on a site walkover survey, completion of an environmental scoping exercise (to inform the content and extent of matters covered in the environmental information) and consultation with statutory bodies.

The EIAR is presented in three volumes as follows;

- Volume 1 - Non-Technical Summary;
- Volume 2 - EIAR; and,
- Volume 3 - EIAR Appendices.

Within the main body of the EIAR (Volume 2), Chapter 1 sets out the introduction and methodology, Chapter 2 describes the project and identifies the information required in an EIAR.

The environmental topics where there is potential for significant effects to arise or if topics or subtopics are scoped out are addressed in Chapters 3 to 12 as follows;

- Chapter 3 Landscape and Visual;
- Chapter 4 Air Quality, Odour & Climate;
- Chapter 5 Noise & Vibration;
- Chapter 6 Land, Soils & Geology;
- Chapter 7 Traffic;
- Chapter 8 Cultural Heritage;
- Chapter 9 Population and Human Health;
- Chapter 10 Biodiversity;
- Chapter 11 Water; and,
- Chapter 12 Material Assets.
- Cumulative effects are addressed in Chapter 13, interactions between disciplines are addressed in Chapter 14 and the Schedule of Environmental Commitments are presented in Chapter 15.

Where appropriate, each of the main sections of this report will be structured in the same general format, as follows:

- An introduction describing the purpose of the section;
- A description of the methodology used in the section;
- A description of the aspects of the existing environment relevant to the environmental topic under consideration;
- Characteristics of the project under consideration;
- An assessment of the likely significant impacts of the effects of the impacts on the environmental topic (if required);
- Recommendations for mitigation measures to reduce or eliminate any significant negative effects identified (if required); and,
- An assessment of the residual effect that will remain, assuming that recommended mitigation measures are fully and successfully implemented (if required).

Further details of the methodology and discipline specific best practice and guidance are presented in the relevant Chapters included within this report.

Sources of information mentioned in the text are either i) listed in full in the bibliography (Chapter 16 – References) or ii) are referenced in full in the text.

1.6. Contributors

This EIAR has been prepared by competent experts. The following table clearly sets out a list of the experts who have contributed to this EIAR, showing which parts of the EIAR they have worked on, their qualifications, experience, and any other relevant credentials.

Name	Company	Area of Expertise	Relevant Chapter / Input	Relevant Qualifications / Professional Accreditation	Relevant Experience
Julie Larkin	Atkins	Resource and Waste Management Plans, Project Management, Environmental Assessment, Contaminated Land Assessments, Environmental Human Health Assessments	Chapter 2 - Project Description Chapter 6 - Land, Soils & Geology Chapter 9 – Population and Human Health Chapter 12 - Material Assets	M.Sc. of Environmental Protection and Management (Hons), 2014 B.Sc. Environmental Science (Hons), 2013 Chartered Member of Institute of Water and Environmental Management (C.WEM)	8 years'
Avril McCollom	Atkins	Construction Environmental Management Plans and Resource Waste Management Plans, Environmental Human Health Assessments, Co-ordinates the preparation of EIARs	Chapter 12 - Material Assets Chapter 9 – Population and Human Health	BSc. (Hons.) in Freshwater and Marine Biology, 2017. Associate membership of Institute of Environmental Management and Assessment (AIEMA)	5 years'
Deirdre Larkin	Atkins	Geology, Hydrogeology, Hydrology, Human Health Risk Assessment	Chapter 11 – Water	BSc. (Hons) Geology (2003) UCC MSc Applied Hydrogeology (2012) University of Newcastle. IGI PGeo No. 223 EurGeol No 1064	20 years'
Alan Forster	AECOM	Marine Modelling Coastal modelling, processes appraisal and support for marine developments	Marine Modelling Studies (Appendix 11.1 to 11.5)	BSc Oceanography with Mathematics MSc Coastal and Estuarine Science and Management MCIWEM	30 years'
Paul O'Donoghue	Atkins	Biodiversity / Ecology	Chapter 10 - Biodiversity	BSc (Zoology), MSc (Behavioural Ecology), PhD in avian ecology and genetics. CEnv, Full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM)	24 years'
Brian Deegan	Uisce Éireann	Natura Impact Statement, Ecological Impact Assessment, Ecological	Natura Impact Statement (Appendix 10.1)	Master's Degree in Estuarine Ecology, Doctorate (Ph.D.) in Freshwater Ecology	18 years'

Name	Company	Area of Expertise	Relevant Chapter / Input	Relevant Qualifications / Professional Accreditation	Relevant Experience
Niamh Sweeney	Uisce Éireann	Appraisals, Water Quality Assessments and Ecological Monitoring Programmes, Ecological surveys: terrestrial, freshwater and marine environment		Full member of the Chartered Institute of Ecology and Environmental Management BSc, MSc(Res) and HDip(GIS)	12 years'
Eamonn Byrne	EBLA Landscape Architects	Landscape and Visual	Chapter 3 - Landscape & Visual	CMLI Chartered Member of the Landscape Institute (2006, UK) Dip. Landscape Design (2003, University of Sheffield) Dip. Hort. Kew (1999, Royal Botanic Gardens Kew, London) HND Landscape Management (1996, Writtle University College, Essex) NCH Hort. (1993, Glasnevin, Dublin) CMLI Chartered Member of the Landscape Institute (2006, UK) Professional Member of Institute of Horticulture (MCI Hort)	23 years'
Imelda Shanahan Nathaniel Blue	TMS Environment Ltd TMS Environmental Ltd	Air Quality, Odour and Climate	Chapter 4 - Air Quality, Odour and Climate Appendix 4.1. AG5 Odour	BSc (Hons) in Chemistry from University College Dublin PhD in Physical Chemistry, Imelda is a Chartered Chemist and a Fellow of the Institute of Chemistry of Ireland and a Fellow of the Royal Society of Chemistry. BSc in Environmental Science from Seattle University (2020) Master's in environmental sciences from Trinity College Dublin (2021)	30 years' 3 years'
Jennifer Harmon	AWN Consulting Ltd	Noise and Vibration	Chapter 5 – Noise and Vibration	BSc (Environmental Science) University of Ulster 1999 Diploma in Area Studies Universidade Nova de Lisboa 1999 Diploma in Acoustics and Noise Control Institute of Acoustics 2001 MIOA, Member of the Institute of Acoustics	17 years'
Nicholas Van Den Berg	Atkins	Traffic and Transportation	Chapter 7 – Traffic	BSc Eng (2013) Member of the Institute of Engineers of Ireland (MIEI)	9 years'
Tony Cummins	John Cronin & Associates	Architecture, Archaeology and Cultural Heritage	Chapter 8 - Cultural Heritage	Bachelor's Degree (Archaeology) University College Cork, 1992 Master's Degree (Archaeology), University College Cork, 1994	28 years'

1.7. EIAR Scoping

As part of the assessment process, an environmental scoping exercise was carried out in accordance with Regulation 17C of the European Union (Waste Water Discharge) Regulations 2007 to 2020. The purpose of the exercise was to define the scope of the EIAR. UÉ requested the EPA to provide its opinion in writing on the scope and level of detail of the information required to be included in the EIAR. The EIA Scoping Report was issued to the EPA, who circulated the EIA scoping report to relevant statutory organisations as part of the assessment process, as detailed further in Section 2.5.

It is concluded that the operation of the project does not pose a risk with regard to potential radiation effects, as no existing plant / equipment on site contains or emits radiation. Therefore, potential radiation effects do not warrant consideration within this EIAR.

There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP, hence there are no changes to the operational phase of the WwTP and Dunn's Park outfall pipe.

Consultation was undertaken with relevant statutory organisations as part of the assessment process, as detailed further in Section 2.5.

All relevant comments from the various consultees and the EPA (received 02/02/2022) have been fully addressed as required within this EIAR.

1.8. Natura Impact Statement

UÉ completed a Natura Impact Statement (NIS) (2023) for the project. The assessment concluded '*that the discharges (current or future loadings) from Youghal WwTP agglomeration do not have the potential to adversely affect the qualifying interests of the Blackwater River (Cork/Waterford) SAC, Ballymacoda (Clonpriest and Pillmore) SAC, Blackwater Estuary SPA, Ballymacoda Bay SPA and Helvick Head to Ballyquin SPA. Consequently, there is no requirement for mitigation measures. To ensure continued satisfactory operation of the Youghal WwTP 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/ relevant SWO guidelines; and,*
- *Continue monitoring the effluent and receiving waters, on a consistent and regular basis'.*

The NIS concluded that '*there will be no adverse effects on the integrity of Blackwater River (Cork/Waterford) SAC, Ballymacoda (Clonpriest and Pillmore) SAC, Blackwater Estuary SPA, Ballymacoda Bay SPA and Helvick Head to Ballyquin SPA or any European Site, in view of these site's conservation objectives and that the conservation status of the Annex I habitats, Annex II species or Annex I bird species, will not be compromised by the WwTP and agglomeration discharges either directly, indirectly or cumulatively. It is therefore concluded that the Youghal WwTP and agglomeration discharges, alone or in combination with other plans and / or projects will not give rise to adverse effects on the integrity of Blackwater River (Cork/Waterford) SAC, Ballymacoda (Clonpriest and Pillmore) SAC, Blackwater Estuary SPA, Ballymacoda Bay SPA and Helvick Head to Ballyquin SPA, or any European Site* (UÉ, 2023). Refer to Appendix 10.1 for the NIS.

2. Project Description

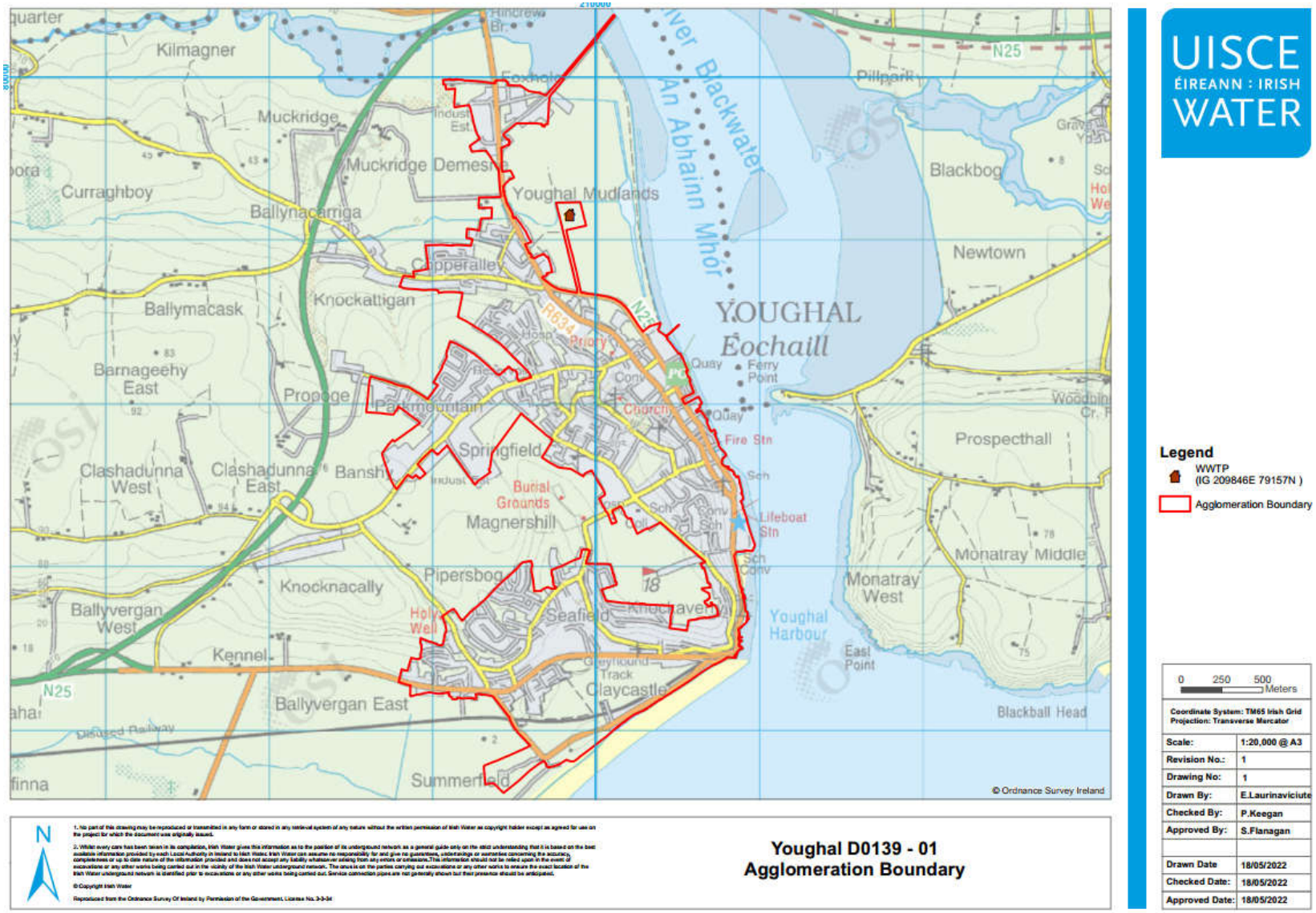
The project is for the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall at Youghal WwTP under Discharge Licence (Reg. No. D0139-03) in Co. Cork. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater M[5] Estuary / Youghal Harbour, which is a Special Protected Area (SPA) (Site Code: 004028), Special Area of Conservation (SAC) (002170) and proposed National Heritage Area (pNHA) (000072).

There are no physical changes occurring with Dunn's Park discharge outfall and there are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The existing WwDL (D0139-01) relates to the maximum design capacity of 16,000 population equivalent (P.E) which will not be altered or changed as part of this EIAR.

The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WwTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP, hence no changes to the operational phase of the WwTP and Dunn's Park outfall pipe will occur.

Refer to Figure 2-1 for the Youghal Agglomeration Boundary. Refer to Figure 2-2 for the outline of Youghal WwTP Dunn's Park discharge outfall. The selected study area for the project depends on each environmental topic. Different subject matter experts may require a wider study area depending on their assessment / walkovers, to ensure a robust assessment for their particular environmental topic.

[5] M denotes Munster



Youghal D0139 - 01
Agglomeration Boundary

UISCE ÉIREANN : IRISH WATER

Legend
- WWTP (IG 209846E 79157N)
- Agglomeration Boundary

0 250 500 Meters

Coordinate System: TM65 Irish Grid
Projection: Transverse Mercator

Scale:	1:20,000 @ A3
Revision No.:	1
Drawing No:	1
Drawn By:	E.Laurinaviciute
Checked By:	P.Keegan
Approved By:	S.Flanagan
Drawn Date	18/05/2022
Checked Date:	18/05/2022
Approved Date:	18/05/2022

Figure 2-1 – Youghal Agglomeration Boundary

Figure 2.2 – Location of Dunn's Park Discharge Outfall

2.1. Current Youghal WwTP Operations

The current WwTP has a biological treatment capacity of 16,000 P.E. The treatment process comprises the following:

- Inlet works providing screening, grit removal, and fat, oil and grease (FOG) removal;
- A screened stormwater overflow (2no. storm tanks);
- Four Sequence Batch Reactor (SBR) tanks for Biochemical oxygen demand (BOD) removal and Nitrification;
- Balance tank for treated wastewater;
- Final effluent pumps;
- Sludge treatment facilities including a picket fence thickener, a sludge dewatering system and a sludge storage tank; and,
- UV treatment of the final effluent.

The WwTP has been designed for the future provision of phosphorus removal. The Emission Limit Values (ELV's) for Youghal WwTP are as follows. Refer to Table 2.1.

Table 2-1 - Current ELVs for Youghal WwTP.

Parameter	Emission Limit Value
Biological Oxygen Demand	25 mg/l
Chemical Oxygen Demand	125 mg/l
Suspended Solids	35 mg/l
Total Nitrogen (as N)	15 mg/l
pH	6-9

The current design of the WwTP is as follows:

Inlet Pumping Station

Dunn's Park Pumping Station consists of 3 no. low level foul pumps and 2 no. high flow pumps which convey the wastewater to the inlet works. Flows of up to 300 l/s are pumped to the inlet works and undergo preliminary treatment (screening and grit removal). Flows in excess of flow to full treatment (125 l/s) are spilled to two storm tanks following grit removal with the first storm tank acting as a blind tank (to capture the first storm flush). When the storm water tank capacity has been reached, a signal is automatically generated at Dunn's Park pumping station to reduce flow to the WwTP to the Flow to Full Treatment (FFT) rate. Storm flows are recycled to the main process flow upstream of FFT measurement when the flow decreases below FFT minus Dry Weather Flow (DWF) with flow being returned at an appropriate rate likely to be equivalent to DWF.

Preliminary Treatment

Flows entering the treatment plant undergo screening, de-gritting and grease removal. This unit consists of screens, screening compactors operating in a duty / assist / common stand-by mode. Each combined unit is fitted with a 6mm manual bypass screen. The tank is aerated to assist grit removal. A slow rotating screw drains the screenings and transports the waste to a collection sump. Gross solids are removed using a minimum of duty/standby automatic 6mm screens (in 2 directions) capable of treating all flows up to 300 l/s. FOG removal is provided at the plant. A maximum of 20 mg/l FOG is permitted to pass through to full treatment.

Sequential Batch Reactors (SBRs)

There are 4 no. identically sized SBR tanks at the treatment plant and they are operated on a predetermined schedule consisting of the following phases: Fill/Anoxic, Fill/Aerate, Aerate, Settle and Decant. The SBR tanks provide the following functions:

- Balance Tank;
- Anoxic Tank;
- Aeration Basin; and,
- Settlement Tank.

The SBR cell contents are mixed (tanks are installed with mixers) without aeration, to provide an anoxic environment to facilitate nitrification. After a short period, aeration is provided by fine bubble diffusers and blowers to achieve BOD removal. Only two tanks can be in “Aerate” mode at any given time. Once aeration has finished, the Settlement phase begins, followed by decanting of the clarified effluent.

Final Effluent Balance Tank

Treated effluent from the SBRs enters the final balance tank and from there it is pumped to the discharge at the outfall. The pumps operate in duty/standby mode.

Final Effluent

The final effluent currently outfalls to the existing sea outfall Dunn’s Park (SW000) which comprises a 750mm diameter outfall to the Blackwater Estuary.

Sludge Treatment

Towards the end of the decant phase, Waste Activated Sludge (WAS) is removed from each of the SBR cells via WAS pumps which operate continuously during the waste period and conveyed to the picket fence thickener. Sludge is then pumped to the centrifuge for dewatering. The pumps are positive displacement and operate in a duty / standby mode. The sludge cake then enters a skip to be removed off site.

Stormwater and Emergency Overflows associated with Youghal WwTP:

- SW002 - Storm Water Overflow from Greenpark Pumping Station;
- SW005 - Storm Water Overflow from Front Strand Pumping Station;
- SW006 - Storm Water Overflow from Greenpark Pumping Station;
- SW007 - Storm Water Overflow from Dunnes Park Pumping Station;
- SW008 - Emergency Overflow from Foxhole Pumping Station;
- SW010 - Storm Water Overflow from Summerfield Pumping Station; and,
- SW011 - Storm Water Overflow from Dunnes Park Pumping Station.

2.2. Description of Baseline Scenario

The baseline scenario including a description of the relevant aspects of the current receiving environment has been considered as part of this EIAR through the collection and collation of baseline data including analytical data where relevant (noise levels). A detailed description of the current receiving environment is presented in relevant sections for each environmental topic.

2.3. Consideration of Reasonable Alternatives

This section outlines the alternatives considered to meet the identified requirements outlined in Chapter 1 – Introduction and Methodology, of this EIAR. The requirement to consider alternatives within the EIAR is set out in Annex IV (2) of the EIA Directive (2014/52/EU) which states:

‘*a description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects*.’

2.3.1. Assessment Methodology

2.3.1.1. Types of Alternatives

The EPA's 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (2022) (hereafter referred to as 'the EPA Guidelines') outlines different types of alternatives that should be considered in an EIAR. These include, do nothing scenario; alternative processes; alternative locations; alternative layouts; alternative designs; and alternative mitigation measures.

The approach adopted for this assessment was first to identify where there were reasonable alternatives to all elements of the project then to consider the impact of these alternatives (if any) on the environmental factors used in this EIAR. Where an impact was identified, this effect was compared with the assessed effect of the ‘Project’.

An indication of the main reasons for the option chosen, taking into account the effects of the project on the environment and including a comparison of their environmental effects is what is required by the Directive. As the EPA (2022) guidance notes: *‘It is generally sufficient to provide a broad description of each main alternative*

and the key issues associated with each option. A detailed assessment (or 'mini-EIA') of each alternative is not required.'

2.3.1.2. Limitations and Assumptions

The degree to which it is possible to assess alternatives depends on the amount of information available for each alternative.

2.3.2. Consideration of Reasonable Alternatives

2.3.2.1. Do Nothing Scenario

The do nothing scenario is the continuation of the existing baseline i.e. discharge treated effluent from Dunn's Park as a temporary discharge outfall. Youghal WwTP will continue to operate in its current format and capacity.

Doing nothing has therefore been rejected as an alternative. Notwithstanding this, environmental effects of doing nothing have been assessed as part of this EIAR and the outcome for all environmental topics are summarised below.

Landscape & Visual

The do nothing scenario is what is currently occurring onsite, that is the continuation of the WwTP in its current format and capacity and the use of Dunn's Park outfall as a discharge outfall. The significance of the do-nothing effect would be neutral and long-term duration for landscape and visual receptors.

Air Quality and Odour and Climate

In this scenario, the existing discharge would remain temporary and the WwTP will continue to operate in its current format and capacity. This scenario does not involve any new works since it relates only to continuing the existing discharge outfall. The existing monitoring occurring onsite as part of the existing WwDL licence (Reg No. D0139-01) at the WwTP results in a non-odorous final effluent at the discharge point. Due as there would be no changes, there would be no change in terms of environmental impact in relation to air quality, odour, and climate.

Noise & Vibration

In the Do Nothing Scenario, the current operations of the Dunn's Park discharge outfall will continue to operate as a temporary discharge point. The prevailing noise environment as measured, will remain unchanged.

Land & Soils

There would be no difference in the 'do nothing' scenario, i.e. the existing baseline; discharge treated effluent from Dunn's Park as a temporary discharge outfall and Youghal WwTP will continue to operate in its current format and capacity. The project will not have any effect on land, soils and geology.

Traffic

There would be no difference in the 'do nothing' scenario, i.e. the existing baseline; discharge treated effluent from Dunn's Park as a temporary discharge outfall and Youghal WwTP will continue to operate in its current format and capacity. The project will remain as is and will not have any effect on traffic.

Cultural Heritage

The 'do nothing' scenario is continuation of the existing baseline, i.e. discharging treated effluent from Dunn's Park with the ongoing operation of the WwTP and would result in no likely effects on the cultural heritage resource.

Population and Human Health

There would be no difference in the 'do nothing' scenario, i.e. the existing baseline; discharge treated effluent from Dunn's Park as a temporary discharge outfall and Youghal WwTP will continue to operate in its current format and capacity. The project will remain as is and will not have any effect on population and human health.

Biodiversity

As noted, there are no physical changes occurring with Dunn's Park discharge outfall and there are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur (this is described in full in Section 2 of this EIAR). In the absence of the project, the site of the WwTP, Dunn's Park outfall, the access road and the public landscaped environs of the road are likely to be managed in the same way as at present. Apart from further maturation of landscape trees little change in terrestrial habitats is therefore envisaged in the short to medium term.

Water

If the project is not undertaken the baseline water environment would remain unchanged. The 'do-nothing' scenario would result in likely neutral effects with regards to hydrology and hydrogeology.

Material Assets

There would be no difference in the 'do nothing' scenario, i.e. the current baseline; discharge treated effluent from Dunn's Park as a temporary discharge outfall and Youghal WwTP will continue to operate in its current format and capacity. The project will remain as is and will not have any effect on built services and waste. The WwTP will continue to discharge treated effluent via the Dunn's Park as per the WwDL.

Major Accidents & Disasters

There would be no difference in the 'do nothing' scenario as the project will not have any effect with regards to major accidents and disasters.

2.3.2.2. Option 1 – Construction of permanent primary outfall at Ferry Point

One alternative considered was the construction of a new permanent primary outfall pipe emerging into a deep trench at Ferry Point (SW001: 210852E, 078125N), in the Blackwater Estuary / Youghal Harbour as per the 2002 Environmental Impact Statement (EIS). However, this outfall pipe was never constructed and following completion of the WwTP, the Dunn's Park discharge outfall has remained in use as the outfall for discharges of treated waste water. The construction of the proposed outfall is delayed for legal reasons. Therefore, the existing primary discharge, Dunn's Park, (SW000: 210464E 78504N) continues to be in use.

The construction phase of Ferry Point has the potential to cause construction impacts on the environment. Dunn's Park discharge outfall is already constructed hence there will be no physical changes occurring with Dunn's Park discharge outfall and there are no changes required to the existing infrastructure to facilitate the project. Therefore no demolition, construction or decommissioning phases will occur. Option 1 is the less favourable option due to construction impacts.

2.3.2.3. Option 2 – Proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall

Alternative two is the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall at Youghal WwTP under Discharge Licence (Reg. No. D0139-03) in Co. Cork.

AECOM completed marine modelling studies for the project; AECOM (2023) Youghal Wastewater Treatment Works Marine Modelling Study Addendum and AECOM (2020) Youghal Marine Modelling Study Modelling Report. Refer to Appendices 11.1 and 11.2 respectively (Refer to Appendix 11.1 to 11.6 for AECOM reports).

The proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall was assessed in AECOM (2023) Marine Modelling Study and concluded '*that the Youghal WwTP, operating at the design capacity of 16 000PE and discharging through the Dunnes Park outfall, will not adversely impact:*

- *The current WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies;*
- *The bathing water quality at the beaches (Youghal Front Strand and Claycastle);*
- *The water quality of the Designated Shellfish Water (Ballymacoda), the Sea Fisheries Protection Authority Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay.*

Dunn's Park as a permanent dicharge outfall would be sufficient and would be the preferable option due to there being no need to carry out construction works for a new outfall. There will be no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP, hence no changes to the operational phase of the WwTP and Dunn's Park outfall pipe will occur.

As the Dunn's Park outfall has been found to be meeting the relevant environmental standards and due to the results of the Marine Modelling Study, UÉ propose to have Dunn's Park discharge outfall as the permanent outfall for discharges of treated wastewater. This is the preferred option in relation to environmental perspective, which has been assessed in this EIAR.

2.4. Consultation

As part of the EIAR assessment process, consultation was undertaken with the EPA. UÉ issued the EIA scoping report to EPA on December 2021. In accordance with the requirements of Regulation 17C & 17D of the European Union (Waste Water Discharge (WWD)) Regulations 2007 - 2020 (hereafter referred to as WWD Regulations), the EPA consulted with the relevant prescribed bodies under Regulation 21(1) of the WWD Regulations.

All relevant environmental stakeholders / prescribed bodies were consulted directly by the EPA in December 2021 (during the Environmental Scoping phase of this EIAR) regarding any environmental opinions that they may have in relation to the project and in turn written opinions were requested from relevant statutory organisations. The following environmental consultees were contacted by the EPA:

- An Taisce;
- Cork County Council (Environment Section);
- Cork County Council (Planning Section);
- Department of Agriculture, Food and the Marine;
- Department of Arts, Heritage, Regional, Rural & Gaeltacht Affairs;
- Environmental Co-ordination Unit | Climate Change & Bioenergy Policy Division
- Failte Ireland;
- Food Safety Authority of Ireland;
- Health & Safety Authority;
- Health Service Executive;
- Inland Fisheries Ireland;
- Ireland Seafood Development Agency - Aquatech@bim.ie;
- Marine Institute; and,
- Sea Fisheries Protection Authority.

A summary of all relevant feedback in relation to the project is presented below. A copy of all responses to the EIA Scoping report received from statutory organisations as part of the EIAR process is presented in Appendix 2.1. All relevant comments from the various consultees have been fully addressed as required within this EIAR and the accompanying Natura Impact Statement (UÉ, 2023).

2.4.1. EPA

In letter correspondence dated 02/02/2022, the EPA noted the following relevant observations:

Please note that under the WWD Regulations, the Agency shall have regard to the matters mentioned in an Environmental Impact Assessment Report (EIAR) in respect of a development only in so far as they relate to the risk of environmental pollution of the receiving waters from the waste water discharge concerned.

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 Agency is of the opinion that the scope and level of detail to be included in the EIAR should as a minimum:

(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) *include an assessment of all discharges from the wastewater works (primary, secondary, storm overflow and emergency) including a cumulative assessment that aims to achieve the Water Framework Directive environmental objectives for the receiving waters;*

(iv) *have regard to the Guidelines on the information to be contained in Environmental Impact Statements, 2002, as appropriate. (Note: there are also Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports, 2017 available);*

(v) *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;*

(vi) *satisfy the requirements of the EIA Directive.*

2.4.2. Department of Agriculture, Food & the Marine

In letter correspondence dated 06/01/2022, the Department of Agriculture, Food & the Marine noted in relation to the EIA scoping report for the project '*has no observations re. the above at this time'.*

2.4.3. Sea Fisheries Protection Authority

In letter correspondence dated 17/12/2021, the Sea-Fisheries Protection Authority noted the following relevant observations:

1. *Possible impacts, if any, on existing wild fisheries in the area, with an emphasis on the possible implications for the SFPA conducting official controls and possible non-compliance issues that could arise.*

The EIAR Scoping report notes "There are a number of aquaculture and fishing practices within the estuary". Having reviewed the application and considering that the proposal is to make the existing temporary discharge outfall of treated effluent at Dunn's Park permanent (plans to create a new outfall at Ferry Point after the commissioning of the WWTP at Mudlands in 2017 were dropped in favour of continued use of Dunn's Park) it is considered unlikely that the project will interfere in any major way with any sea-fishing operations. No implications for the SFPA conducting official controls are envisaged nor any non-compliance issues.

2. *Impacts, if any, on shellfish growing areas adjacent to or within the area and the possible impact on the ability of the SFPA to conduct official controls and possible non-compliance issues that could arise.*

In the cover letter to the EIAR Scoping report it states "…the study concluded there is no impact on WFD Protected Areas including Designated Bathing Waters, Designated Shellfish Waters and European sites, under both existing and future loading scenarios."

While the effects on the existing oyster producing operations in the classified shellfish production areas off Ballymacoda are unknown, it is not envisaged that they would be impacted upon by the proposed transition from temporary to permanent outfall at Dunn's Point. The study notes that: "Inshore waters running south of Youghal (including Ballymacoda Bay) are designated as a Bivalve Mollusc Production Area (i.e. from Knockaderry, Youghal to Knockadoon head, ca. 7km south of the outfall)"; "A number of shellfish aquaculture sites are located in Ballymacoda Bay". In addition, it notes that "Ballymacoda Bay SAC (Code Site: 000077) is located ca. 6km south west, Ballymacoda Bay SPA (Code Site: 004023) is located ca. 6km south west"

No implications for the SFPA conducting official controls are envisaged nor any non-compliance issues. The existing Shellsan monitoring program, via routine monthly bivalve sampling, will be maintained unhindered at the Ballymacoda site.

3. *Possible impacts, if any, on seafood safety.*

It is not anticipated that there will be any change in impacts on Seafood safety.

"As part of the marine modelling study, the impact of discharges at Ferry Point and Dunn's Park were assessed on the applicable receiving environmental quality standards as set out in the legislation (Water Framework Directive Waterbodies; Designated Bathing Waters and Designated Shellfish Waters) and by reference to the potential impact on Classified Bivalve Mollusc Production Areas as delineated by the Sea Fisheries Protection Authority (SFPA). The study concludes that 'none of the scenarios modelled (listed above) indicate a degradation of the overall water quality of any of the receiving waterbodies, nor any degradation of the indicative quality of any WFD supporting quality element for any of the water bodies' (AECOM, 2020). The study also concludes 'that during summer when the UV system is operational, there will be no measurable impact from the treated effluent from the Youghal WWTP on the microbiological water quality of Designated Shellfish Waters or Classified Production Areas."

2.4.4. An Taisce

In letter correspondence dated 09/12/2021, An Taisce responded with an automatic email reply.

2.5. Consideration of Cumulative Effects with other Projects

Potential cumulative effects, defined as '*the addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects'* (EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports, 2022) have been considered for each environmental topic within this EIAR. Refer to Chapter 13 – Cumulative Impacts.

2.6. Risk of Major Accidents and/or Disasters

The EPA (2022) EIAR Guidelines state that an EIAR must include the expected effects arising from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project. There are two key considerations; the potential of the project to cause accidents and/or disasters and the vulnerability of the project to potential disasters / accidents.

As there are no construction works associated with the project, there is no risk of major accidents and / or disasters to or from the project associated with construction.

The current Site operates an Environmental Incident Emergency Response Plan which is made available to all relevant site staff. Typically, emergency procedures would include contact details of key personnel in local authorities and statutory authorities including the National Parks and Wildlife Services (NPWS), Inland Fisheries Ireland (IFI), CCC and the EPA. Emergency preparedness and response procedures are currently present onsite at the WwTP in the highly unlikely event of an environmental pollution incident onsite.

There are no Lower or Upper Tier Seveso Site, within 15km of the project. Therefore no further consideration of the SEVESO Directive (DIRECTIVE 2012/18/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC) is warranted for the project. The Site location is outside the consultation zones of all SEVESO Sites and is therefore considered to not be susceptible to any particular exceptional human health risks.

On a regional scale there are currently 4no. EPA licenced facilities within 5km of the Site, as follows:

- Youghal Landfill at Youghal Mudlands, Youghal, Cork (W0068-03) is an Industrial Emissions (IE) licensed landfill facility located 427m north of the WwTP and ca. 1.5km north (and upstream) of Dunn's Park outfall pipe;
- ERAS ECO Ltd. at Foxhole, Youghal, Cork (W0211-02) is an IE licensed industrial facility, located 480m north of the WwTP and 1.40km south (and upstream) of Dunn's Park outfall pipe;
- Technicolour Home Entertainment Services Ireland Limited at Foxhole Industrial Estate, Youghal, Cork (P0151-02) is an Integrated Pollution Control (IPC) licensed facility, located 620m north of the WwTP and 1.6km south (and upstream) of Dunn's Park outfall pipe;
- Ashleigh Farms (Waterford) Limited is located in Waterford P0651-01 is an IPC licensed facility, located 3.7km southeast of the WwTP and 3km southeast of Dunn's Park outfall pipe.

All of these EPA facilities are licenced under an EPA licence, which sets out schedules (emission limits and monitoring) and conditions on how the licenced activities must operate so as to protect the environment from pollution that might otherwise arise. Hence risk of major accident and/or disaster are unlikely.

There is potential for accidental discharge / uncontrolled release or spillage of untreated wastewater to occur. However due to the current design of Youghal WwTP detailed in section 2.1 and the Storm Water Overflows there is no likely significant effect to the environment and risk of major accident and/or disaster are unlikely.

Atkins (2023) completed a Stage 1 Flood Risk Assessment (FRA) for this project. The purpose of the *Stage 1 Flood risk identification* process was to establish if there was existing flood risk or potential future flood risk. Depending on the findings of the *Stage 1 Flood risk identification* report, it will be determined if further detail by undertaking a *Stage 2 – Initial flood risk assessment* is required.

The FRA stated that '*the study area in this report is in relation to the temporary discharge outfall being made into a permanent discharge outfall, however, it is noted that the existing Youghal WwTP and existing temporary discharge outfall are located within flood zone A as indicated on both the current ICPSS maps and East Cork Municipal District LAP. As indicated in* ***Appendix D*** *(in the FRA), the existing WwTP appears to have been designed and constructed to take account of coastal flooding that may occur. All the equipment and storage/treatment tanks appear to be placed above the existing ground level in order to provide strategic protection for the machinery. This application does not propose to carry out any construction works or make changes to the existing temporary outfall in River Blackwater. There will be no changes on site that will increase existing or potential risk of flooding or obstruct any flow paths'* (Atkins, 2023).

This stage 1 flood risk assessment conclusion is therefore;

- *'There are no physical changes occurring.*
- *There is no historic risk of existing flooding at the site.*
- *In accordance with the OPW 'The Planning System and Flood Risk Management' guidelines, Section 5.28, such minor development that do not have any impact on flood risk or flow paths will not need a justification test. As there is no construction or demolition, a Stage 2 – Flood Risk Assessment is deemed not required'* (Atkins, 2023).

Stage 1 – Flood Risk Identification is concluded and a Stage 2 – Flood Risk Assessment is deemed not required.

Refer to Appendix 11.8 for the Atkins (2023) Stage 1 - Flood Risk Assessment.

3. Landscape and Visual

3.1. Introduction

This Landscape and Visual Impact Assessment (LVIA) has been prepared by Eamonn Byrne Landscape Architects Ltd (EBLA) – a Registered Practice of the Landscape Institute – and relates to the use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall at Youghal Waste Water Discharge Licence (Reg. No. D0139-03) at Youghal, County Cork.

3.2. Methodology

LVIA is used to identify and assess the likely significance of the effects of change resulting from a development. The two components of LVIA are:

- Assessment of landscape effects: assessing effects on the landscape as a resource in its own right; and,
- Assessment of visual effects: assessing effects on specific views and on the general visual amenity experienced by people.

The assessment was carried out with reference to the following:

- Guidelines for Landscape and Visual Impact Assessment (3rd Edition, 2013);
- Highways Agency (HA) (2010), Landscape and Visual Effects Assessment, Interim Advice Note 135/10;
- County Cork Development Plan 2022-2028, which incorporates a summary of the Landscape Character Assessment of County Cork;
- County Cork Development Plan 2022 mapping[6]; and,
- County Cork Draft Landscape Strategy 2007.

The assessment was carried out in February 2023 through a combination of desk study and collation of data gathered during earlier field surveys in September 2022. Weather conditions during this survey were good, enabling excellent visibility. The project involves no changes to the WwTP and no construction works; therefore, the site survey was limited to Dunn's Park discharge outfall. At the time of the survey the tide was sufficiently low that Dunn's Park discharge outfall was partially exposed and visible where it enters the Lower Blackwater M Estuary, otherwise the outfall pipe is not visible as it is underground. The survey and assessment were carried out by Eamonn Byrne, Chartered Landscape Architect.

Project description/ specification

The project was checked to make sure that the essential aspects of the project that give rise to effects on landscape and visual amenity has been described. These aspects also include:

- The section of outfall pipe that is visible as it enters the Lower Blackwater M Estuary and the length of this pipe that is visible up to it greatest extent at low tide is the only aspect of the project likely to give rise to effects on landscape and visual amenity;
- Sections of pipe that are underground or below the water level at low tide would not lead to any landscape and visual effects and are excluded from this assessment. As the pipe is already constructed there would be no construction landscape effects, so these have been excluded from the assessment; and,
- The project involves no changes to the WwTP and no construction works therefore, the site survey was limited to Dunn's Park discharge outfall.

Study Area

The extent of the Study Area for the LVIA is an ellipse extending to 500m from the centre of the outfall location as it enters the Lower Blackwater M Estuary. This area may be seen on Figure 3.1 and Appendix 3.1.

[6] https://corkcoco.maps.arcgis.com/apps/webappviewer/index.html?id=0998608db8dd4fa2b7dfeb2e5ec808ce

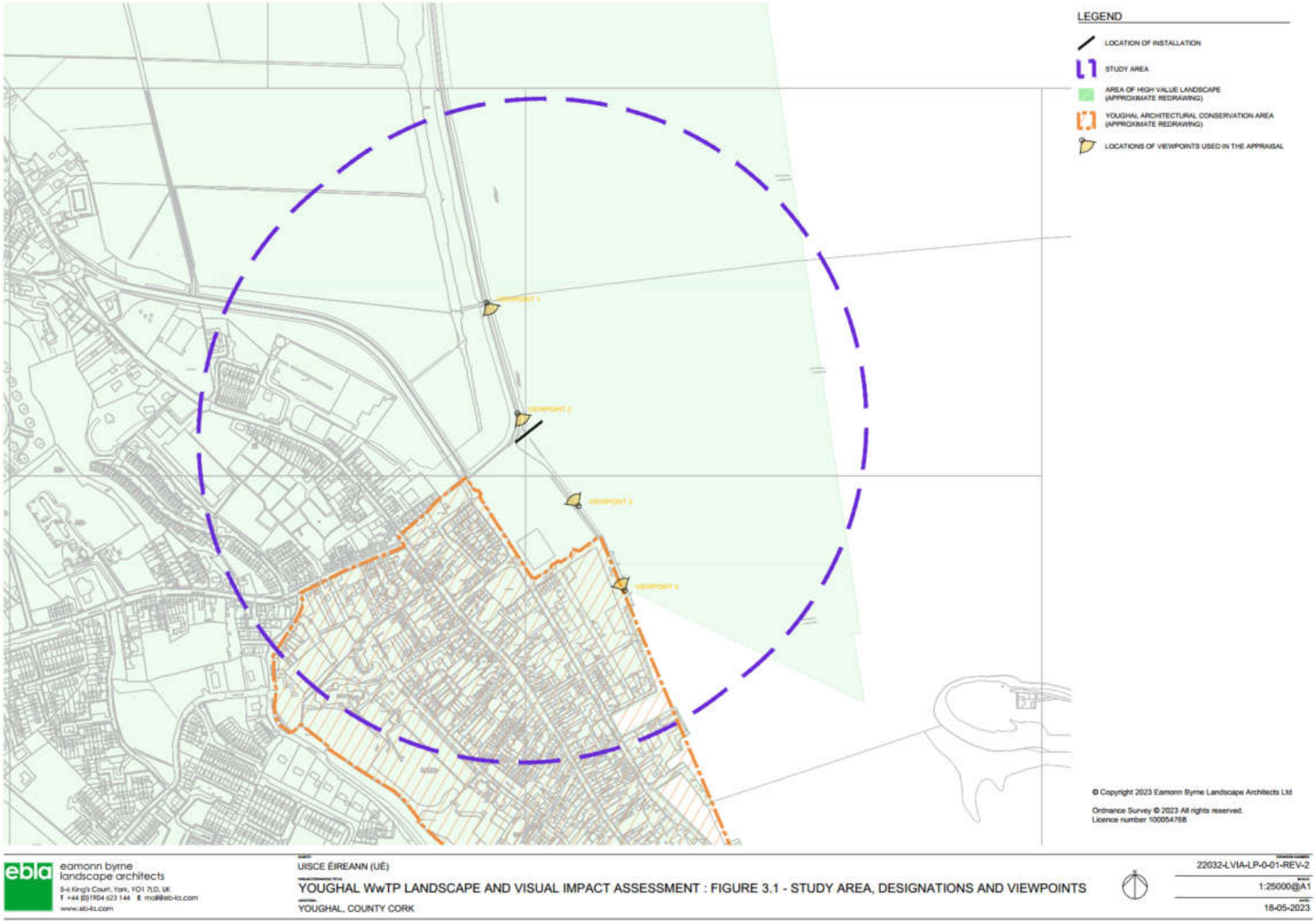


Figure 3.1 - Designation and Viewpoints

Study Constraints

Both the local planning documentation and the existing landscape character assessments raise the potential for seascape assessment of the County's coast and marine areas. However, as the County Cork Development Plan 2022-2028 states:

'It would be premature to consider the feasibility of carrying out a seascape assessment for County Cork until the preparation of a National Landscape Characterisation has been completed and legislation on the future management of foreshore development has been enacted'. (p.330, par.14.8.12).

Hence, any aspects of the coastline or seaward side of the Study Area or effects upon them described in this assessment are considered as part of the landscape character analysis.

Baseline Analysis

The baseline landscape and visual conditions were established.

Visual Baseline

The aim of the visual baseline is *'to establish the area in which the development may be visible, the different groups of people who may experience views of the development, the places where they will be affected and the nature of the views and visual amenity at those points'* Landscape Institute and Institute of Environmental Management and Assessment (2013). The baseline study was undertaken by desktop study followed by a field survey. It was not necessary to carry out a Zone of Theoretical Visibility analysis since any visibility of the project could be verified directly on site.

Landscape Assessment Criteria

The overall significance of effects is established by combining the separate judgements about sensitivity and magnitude of effects. Sensitivity includes an assessment of the landscape receptors susceptibility to change and value. Magnitude includes an assessment of the impact on landscape receptors in terms of size or scale, geographical extent of the area influenced. The criteria for assessing sensitivity of landscape effects are described in Table 3-1. The criteria for assessing the magnitude of impact are described in Table 3-2 below. The separate assessments of sensitivity and magnitude are then combined to determine the significance of effect on each receptor. The results of sensitivity and magnitude are compared against the matrix at Table 3-3 which in combination with professional judgement guides the assessment of overall significance. These levels of significance can either be beneficial or adverse and are described in Table 3-4. The criteria listed at Tables 3.1 to 3.4 are derived from Highways Agency (HA) (2010), Landscape and Visual Effects Assessment, Interim Advice Note 135/10 and amended by EBLA for the specific purposes of this assessment.

Visual Assessment Criteria

The overall significance of effects is established by combining the separate judgements about sensitivity and magnitude of effects. Sensitivity includes an assessment of the visual receptors susceptibility to change, and the value attached to views. Magnitude includes an evaluation of the visual impact identified in terms of size or scale and geographical extent of the area influenced. The criteria for assessing sensitivity of visual effects are shown at Table 3-1 below. The criteria for assessing the magnitude of impact are shown at Table 3-2 below. The separate assessments of sensitivity and magnitude are then combined to determine the significance of effect on each receptor. The results of sensitivity and magnitude are compared against the matrix at Table 3-3 which in combination with professional judgement guides the assessment of overall significance. These levels of significance can either be beneficial or adverse and are described in Table 3-4. The criteria listed at Tables 3.1 to 3.4 are derived from Highways Agency (HA) (2010), Landscape and Visual Effects Assessment, Interim Advice Note 135/10 and amended by EBLA for the specific purposes of this assessment.

Table 3.1 - Local landscape related policies relevant to the Study Area

Sensitivity	Landscape	Visual
High	Key features and characteristics of landscape of distinctive character, susceptible to relatively small changes. Likely to be designated such as National Parks.	-Residential properties with views towards the project from ground floor and first floor windows, -Public footpaths or other recreational trails (e.g., national trails, footpaths, bridleways, etc.) with open views of the scheme proposals, -Users of recreational facilities where the

Sensitivity	Landscape	Visual
		purpose of that recreation is enjoyment of the countryside (e.g., National Parks or other access land etc.). Highly valued views (e.g., from heritage assets, views featured in art and literature).
Moderate	Moderately significant features and characteristics in a distinctive landscape or a landscape of moderately distinctive character reasonably tolerant of changes.	-Residential properties with limited views due to partial obstruction towards the the project, -Public footpaths or other recreational trails (e.g., national trails, footpaths, etc.) with restricted views of the scheme proposals, -Outdoor workers, -Users of lower speed passenger railways, -Users of scenic roads, railways or waterways or users of designated tourist routes, -Schools and other institutional buildings, and their outdoor areas.
Low	Unimportant features or characteristics or indistinct landscape character types potentially tolerant of substantial change.	-Indoor workers, -Users of main roads (e.g., motorway or national routes) or passengers in public transport on main arterial routes, -Users of higher speed passenger or freight railways, -Users of recreational facilities where the purpose of the recreation is not related to the view (e.g., sports facilities).

Table 3-2 – Magnitude of Impact Criteria

Magnitude	Landscape	Visual
Major	Total loss or large-scale damage to existing character or distinctive features and elements, and/ or the addition of new but uncharacteristic conspicuous features and elements. Large scale improvement of character by the restoration of features and elements, and/or the removal of uncharacteristic and conspicuous features and elements, or by the addition of new distinctive features.	The project, or a part of it, would become the dominant feature or focal point of the view. Majority of viewers affected. Major alternation of baseline view.
Moderate	Partial loss or noticeable damage to existing character or distinctive features and elements, and/ or the addition of new but uncharacteristic noticeable features and elements.	The project, or a part of it, would form a noticeable feature or element of the view which is readily apparent to the receptor. Many/some viewers affected. Partial alternation of baseline view.

Magnitude	Landscape	Visual
	Partial or noticeable improvement of character by the restoration of existing features and elements, and/ or the removal of uncharacteristic and noticeable features and elements, or by the additional of new characteristic features.	
Minor	Slight loss or damage to existing character or features and elements, and/or the addition of new but uncharacteristic features and elements. Slight improvement of character by the restoration of existing features and elements, and/or the removal of uncharacteristic features and elements, or by the addition of new characteristic elements.	The project, or a part of it, would be perceptible but not alter the overall balance of features and elements that comprise the existing view. Few viewers affected. Minor alternation of baseline view.
Negligible	Barely noticeable loss or damage to existing character or features and elements, and/or the addition of new but uncharacteristic features and elements. Barely noticeable improvement of character by the restoration of existing features and elements, and/or the removal of uncharacteristic features and elements, or by the addition of new characteristic elements.	Only a very small part of the project would be discernible, or it is at such a distance that it would form a barely noticeable feature or element of the view. Few viewers affected. Very minor alternation of baseline view.
No Change	No noticeable loss, damage or alternation to character or features or elements.	No part of the project, or work or activity associated with it, is discernible. No viewers affected.

Table 3-3 – Significance of effect categories

Landscape/ Visual Sensitivity	**Magnitude of impact**				
	No change	Negligible	Minor	Moderate	Major
High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
Moderate	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate

Table 3-4 - Typical descriptions of significance of effect categories

Category	Landscape	Visual
Very Large Beneficial Effect	The project would greatly enhance the character (including quality and value) of the landscape; create an iconic high-quality feature and/or series of elements; enable a	The project would create an iconic new feature that would greatly enhance the view.

Category	Landscape	Visual
	sense of place to be created or greatly enhanced.	
Large Beneficial Effect	The project would enhance the character (including quality and value) of the landscape; enable the restoration of characteristic features and elements lost as a result of changes from inappropriate management or development; enable a sense of place to be enhanced.	The project would lead to a major improvement in a view from a highly sensitive receptor.
Moderate Beneficial Effect	The project would improve the character (including quality and value) of the landscape; enable the restoration of characteristic features and elements partially lost or diminished as a result of changes from inappropriate management or development; enable a sense of place to be restored.	The project would cause obvious improvement to a view from a moderately sensitive receptor, or perceptible improvement to a view from a more sensitive receptor.
Slight Beneficial Effect	The project would complement the character (including quality and value) of the landscape; maintain or enhance characteristic features and elements; enable some sense of place to be restored.	The project would cause limited improvement to a view from a receptor of medium sensitivity or would cause greater improvement to a view from a receptor of low sensitivity.
Neutral Effect	The project would maintain the character (including quality and value) of the landscape; blend in with characteristic features and elements; enable a sense of place to be retained.	Difficult to distinguish, barely perceptible change in view. No perceptible change in view
Slight Adverse Effect	The project would not quite fit the character (including quality and value) of the landscape; be at variance with characteristic features and elements; detract from a sense of place.	The project would cause limited deterioration to a view from a receptor of medium sensitivity or cause greater deterioration to a view from a receptor of high sensitivity
Moderate Adverse Effect	The project would conflict with the character (including quality and value) of the landscape; have an adverse impact on characteristic features or elements; diminish a sense of place	The project would cause obvious deterioration to a view from a moderately sensitive receptor, perceptible damage to a view from a more sensitive receptor.
Large Adverse Effect	The project would be at considerable variance with the character (including quality and value) of the landscape; degrade or diminish the integrity of a range of characteristic features and elements; damage a sense of place.	The project would cause major deterioration to a view from a highly sensitive receptor and would constitute a major discordant element in the view.
Very Large Adverse Effect	The project would be at complete variance with the character (including quality and value) of the landscape; cause the integrity of characteristic features, elements and sense of place to be lost.	The project would cause the loss of views from a highly sensitive receptor and would constitute a dominant discordant feature in the view.

3.2.1. Receiving Environment-Landscape

The aim of the landscape baseline is '*to provide an understanding of the landscape in the area that may be affected, its constituent elements, it's character and way it varies spatially, its geographic extent, its history, its condition and the way the landscape is experienced, and the value attached it.*' Landscape Institute and Institute of Environmental Management and Assessment (2013).

Planning policy

Policies included in the County Cork Development Plan of relevance to landscape character within the Study Area are summarised in Table 3.5 below, together with their relevance to the subject of this assessment. Quotations in the table are selected for relevance rather than being reproduced in full.

Table 3.5 - Local landscape related policies relevant to the Study Area

Policy Objective number & page	Summary/*quotation*	Relevance
MCI 7-2: Development in Coastal Areas, p.148	*Sustainably manage development within the coastal zone taking account of its… landscape values.*	The site and Study Area lie at the coast; hence particular attention to landscape value as identified in the County Cork Landscape Character Assessment is required. This assessment does not consider that the project makes a substantive difference to landscape value.
EC 8-14: Business Development in Rural Areas, p.184	*The proposal will not adversely affect the character, appearance, and biodiversity value of the rural landscape.*	Location of the site on the periphery of Youghal means any effects may be considered to apply to the rural landscape. This appraisal considers that the project does not adversely affect character or appearance. (Biodiversity is the subject of a separate chapter in this report).
GI 14-1: Countywide Green and Blue Infrastructure Objectives, p.322	*d) Recognise rivers… as one of the natural foundations for multi-functional green and blue infrastructure corridors…* *h) Integrate the provision of green infrastructure with infrastructure provision and replacement, including walking and cycling routes, as appropriate, while protecting…other landscape resources.*	The site lies adjacent to the estuary of the river Blackwater, hence likely to be considered a green infrastructure asset. A public walkway exists along the shoreline adjacent to the outfall, hence the site contributes to green infrastructure. The project does not affect the green infrastructure function of the river corridor, or negatively impact upon access to open space.
GI 14-9: Landscape, p.331	*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.*	General policy applying to the whole county including the Study Area. This assessment does not consider that the project damages the visual or scenic amenity of the built or natural environment.

Policy Objective number & page	Summary/*quotation*	Relevance
GI 14-10: Draft Landscape Strategy, p.331	*Ensure that the management of development… will have regard for the value of the landscape, its character, distinctiveness and sensitivity… in order to minimize the visual and environmental impact of development, particularly in areas designated as High Value Landscapes where higher development standards… will be required.*	Study Area lies within an area designated as High Value Landscape. Notwithstanding the designation of the area as a High Value Landscape, this assessment considers the project which already exists to be sufficiently minimal in scale and in keeping with the adjacent environment such that it does not affect value, character or distinctiveness.
GI 14-12: General Views and Prospects, p.332	*Preserve the character of all important views and prospects, particularly sea views, river or lake views… coastal landscapes… and views of natural beauty as recognized in the Draft Landscape Strategy.*	As a riverine/coastal landscape, views within the Study Area may be considered important. This assessment considers that the project does not negatively impact riverine or coastal views due to its small scale and that it is already present.
HE 16-18: Architectural Conservation Areas, p.366	*Conserve and enhance the special character of the Architectural Conservation Areas included in this Plan… [This] includes its… landscape and setting.*	The outfall pipe where it enters the estuary is partially visible and being the only visible component of the proposals is sufficiently remote from the Youghal Conservation Area (YCA) boundary that is does not affect the setting.

Relevant designations

The site and Study Area lie within a 'High Value Landscape' as designated by the County Cork development plan. This is derived from the Draft Landscape Strategy 2007 as outlined at 'Existing character assessments' below.

Immediately south of the site, the Youghal Conservation Area encompasses the town centre and the shoreline. The development is sufficiently distant from the Architectural Conservation Area (ACA), that it does not affect the setting of the ACA.

Within the County Development Plan, a designation of stretches of road as 'Scenic Routes' is defined. These are routes from which the views are considered to be worthy of protection from inappropriate development. The nearest of these to the site lie 1.25km to the north-west of the site and 2.25km from the project. Given that there will be no changes to the WwTP and the small scale of the area where the outfall is visible as it enters the estuary, any visual effects upon this scenic route are judged to be negligible to non-existent.

Existing character assessments

The Study Area lies within an area defined by the Draft Landscape Strategy as 'Youghal Bay', of landscape character type 2: Broad Bay Coast. Its key characteristics relevant to the Study Area include:

- a coastline sweeping in broad bays, flanked by low promontories, terminating along the shore with low cliffs and a combination of rocky shores and long crescent shaped bays;
- moderately sized fertile fields bounded by low broadleaf hedgerows, used mostly for dairy pasture with some tillage; and,
- scattered and isolated cottages, two-storey houses, farmhouses and towns including Youghal.

As of 2007, pressures for change included tree loss, climate change, rising sea levels, large tourism developments and declining agricultural activity. The Landscape Character Assessment assigns a landscape value of 'Very High' and landscape sensitivity of 'Very High' to the area, recommending the following measures of relevance to landscape within the Study Area and the project forming the subject of this appraisal:

- continued promotion of tourism, whilst protecting and maintaining beaches and scenic landscapes;
- recognition of the scenic, recreational and cultural value of the area; and,
- protection of the setting of existing promontories forming part of the coastline.

The Study Area straddles the coastline extending both inland and towards the centre of the Lower Blackwater M Estuary. On the landward side, the area is predominantly urban and highly varied in character and quality, incorporating the northern fringe of Youghal including central urban waterfront, a small industrial estate, mid-twentieth century suburb, a retail park and open countryside. The immediate environs of the project are dominated by industrial features including the concrete seawall, security fencing and hard standing. The foreshore is comprised of a shallow shingle beach sloping to a sandy shelf. The discharge pipe crosses this beach perpendicular to the shoreline, sloping gradually into the water.

The immediate environs of the project are unlikely to be considered representative of the character which confers a High Value Landscape to the wider area. Instead, this designation is likely to rest on the overall quality of the surrounding landscape, including the scenic qualities of the estuary, nearby hills, historic towns and villages and open countryside.

3.3. Receiving Environment-Visual

The aim of the visual baseline is '*to establish the area in which the development may be visible, the different groups of people who may experience views of the development, the places where they will be affected and the nature of the views and visual amenity at those points.'* Landscape Institute and Institute of Environmental Management and Assessment (2013).

Visibility

There will be no changes to the WwTP including site infrastructure and access roads as part of the project, therefore there would be no change to baseline landscape and visual receptors from these elements. Dunn's Park discharge pipe will become a permanent discharge outfall from Youghal Wastewater Treatment Plant. The only other element of the project which is visible includes the section of outfall pipe that is visible as it enters the Lower Blackwater M Estuary and the length of this pipe that is visible up to it greatest extent at low tide. Sections of pipe that are underground or below the water level at low tide would not lead to any visual effects. The extent of visibility is restricted to the shoreline route running north from Youghal, with the outfall pipe being partially visible except at high tide.

Visual Receptors

Visual receptors include people in boats on the adjacent estuary, and people (both residents, visitors and outdoor workers) walking along the shoreline route north from Youghal including, Green's Quay and the costal path at Dunn's Park. Descriptions of the baseline view from representative viewpoints along this route are described below. The viewpoint locations are illustrated on Figure 3.1 and Appendix 3.1. The viewpoint images are illustrated in Appendix 3.2.

Viewpoint 1: approximately 200m north of the project. Receptors include users of the shoreline path at Dunn's Park. This location coincides with a small concrete bridge crossing the outflow of a drainage channel into the Blackwater. The view is centred on the estuary, which is framed by the banks and headlands to either side. The nearside is dominated by the quayside buildings of the Youghal shorefront, some of which are several stories in height. The cluster also includes low, extensive warehousing and a small crane. Nearer to the viewer, this side of the estuary is formed by engineered banks falling to a shallow beach. On the opposite side, low hills above cliffs terminate the view, patterned with woodland and fields and dotted with occasional buildings. Within the water, boats and buoys add visual interest. The outfall pipe as it enters the estuary is noticeable without being dominant and appears in keeping with the form of the shoreline as well as the functional nature of the surrounding infrastructure. The overall impression is pleasant and impressive without being spectacular, and with the Youghal quayside buildings detracting somewhat from the otherwise positive view. This view is likely to be valued locally by walkers and residents.

Viewpoint 2: approximately 60m north-west of the project. Receptors include users of the shoreline path at Dunn's Park. Taken from the informal shoreline footpath immediately north of the open ground at Green's Quay, the view here is similar in composition to Viewpoint 1 but with the industrial complex at Youghal being more dominant. The outfall pipe as it enters the estuary is also a more substantial component, being an important feature in the view. However, given the semi-industrial context, it does not appear out of place and may be considered to add visual interest to the view. As with Viewpoint 1, the overall impression is pleasant and impressive without being spectacular. The view is likely to be valued locally by walkers and residents.

Viewpoint 3: approximately 140m south of the project. Receptors include users of the shoreline path. Taken from alongside the open area forming part of the industrial complex north of the town, this view faces northwards along the western shore of the estuary with the curve of the shoreline forming its most important organising component. Dominant in the foreground is the security fencing around the industrial yard, as well as the sloped concrete seawall and beach of dark coloured rocks and shingle. The backdrop is formed by low hills patterned by woodland and fields and dotted with buildings. The outfall pipe as it enters the estuary is also an important

though not dominant component, appearing in the centre of the view as a slender horizontal line terminating part way across the view. In spite of the adjacent fencing and industrial yard, the overall impression is pleasant. The view is likely to be valued locally by walkers and residents.

Viewpoint 4: approximately 290m south of the project. Receptors include users of Green's Quay. Taken from the wide quayside at Green's Quay, this view is dominated by the adjacent warehousing and quay infrastructure including the concrete platform, metal moorings and buffering tyres on the quayside. The backdrop is formed by low hills patterned by woodland and fields and dotted with buildings. Although clearly noticeable in the middle distance, the outfall pipe as it enters the estuary is a minor component, appearing in conjunction with the quayside. The overall impression is of an ordinary but not unpleasant environment with features of visual interest and with a more decisively positive backdrop. The view may be valued locally by walkers and residents.

3.4. Potential Landscape and Visual Effects During Construction

Since the project is already in place, no construction activities are required. Hence there would be no construction related landscape and visual effects from the project.

3.5. Potential Landscape Effects During Operation

This section describes the effects of the project on landscape receptors and assesses the significance of the effects identified.

The effect of the project is to retain the existing outfall pipeline for permanent use. As the project already is an element of the local landscape character, there would be no change to existing landscape character or landscape elements as a result of the project. The area where the outfall pipeline is visible already includes infrastructure including the concrete seawall, security fencing, warehousing and industrial machinery. It is therefore judged that the local landscape has **low** sensitivity to the project as it is already an element characteristic of its location.

The geographical extent over which the outfall pipe is perceptible will not change and stay limited to the area where it enters the estuary and the shoreline route near the immediate setting of the outfall. Therefore, the magnitude of change to landscape character is judged to be **no change.**

The combination of low sensitivity and no change magnitude suggests the significance of the effects on landscape character within the study area is judged to be neutral and long term.

3.6. Potential Visual Effects During Operation

This section describes the effects of the project on visual receptors and assesses the significance of the effects identified. The significance of effect of the project on representative viewpoints is detailed below. As the project already exists, there would be no change to existing views as a result of the project on visual receptors including people boating on the estuary and people using Green's Quay and the coastal path at Dunn's Park.

The viewpoint locations are illustrated on Figure 3.1 and Appendix 3.1. The viewpoint images are illustrated in Appendix 3.2.

Viewpoint 1: approximately 200m north of the project. People using the shoreline path at Dunn's Park already have views including the outfall pipe as it enters the estuary and are judged to have low sensitivity to the project. There would be no change in view. The numbers of receptors affected would be none. The combination of no change in view and no people affected the magnitude of the effect is judged to be no change.

The combination of low sensitivity and no change magnitude, the significance of the visual effect is judged to be neutral effect.

Viewpoint 2: approximately 60m north-west of the project. People using the shoreline path at Dunn's Park already have views including the outfall pipe as it enters the estuary and are judged to have low sensitivity to the project. There would be no change in view. The numbers of receptors affected would be none. The combination of no change in view and no people affected the magnitude of the effect is judged to be no change.

The combination of low sensitivity and no change magnitude, the significance of the visual effect is judged to be neutral effect.

Viewpoint 3: approximately 140m south of the project. People using the shoreline path at Dunn's Park already have views including the outfall pipe as it enters the estuary and are judged to have low sensitivity to the project. There would be no change in view. The numbers of receptors affected would be none. The combination of no change in view and no people affected the magnitude of the effect is judged to be no change.

The combination of low sensitivity and no change magnitude, the significance of the visual effect is judged to be neutral effect.

Viewpoint 4: approximately 290m south of the project. Receptors include users of Green's Quay. People using Green's Quay already have views including the outfall pipe as it enters the estuary and are judged to have low sensitivity to the project. There would be no change in view. The numbers of receptors affected would be none. The combination of no change in view and no people affected the magnitude of the effect is judged to be no change.

The combination of low sensitivity and no change magnitude, the significance of the visual effect is judged to be neutral effect.

3.7. Do Nothing Scenario

The do nothing scenario is what is currently occurring onsite, that is the continuation of the Wastewater Treatment Plant in its current format and capacity and the use of Dunn's Park outfall as a discharge outfall. The significance of the do-nothing effect would be neutral and long-term duration for landscape and visual receptors.

3.8. Cumulative Effects

The list of possible projects as detailed in Chapter 13 of this report which could have potential cumulative effects has been considered. There would be no significant cumulative landscape or visual effects resulting solely from the interaction of the project with other recent or proposed developments as detailed in Chapter 13 of this report.

3.9. Mitigation Measures

No mitigation measures are considered necessary.

3.10. Residual Effects

There will be no significant residual effects. Residual landscape and visual effects will be neutral and long-term.

3.11. Monitoring Requirements

No monitoring in relation to landscape and visual effects is considered necessary.

3.12. Difficulties encountered during the preparation of this chapter

There were no difficulties/ constraints encountered undertaking this LVIA.

4. Air Quality, Odour & Climate

4.1. Introduction

This Chapter of the EIAR considers the potential air quality, odour and climate effects associated with the project at Youghal. This Chapter of the EIAR was prepared by Imelda Shanahan and Nathaniel Blue of TMS Environment Ltd. Imelda has over 30 years professional experience in completing assessments of this type for various different types of development. Imelda has a BSc (Hons) in Chemistry from University College Dublin and a PhD in Physical Chemistry, she is a Chartered Chemist and a Fellow of the Institute of Chemistry of Ireland and a Fellow of the Royal Society of Chemistry. Nathaniel has a Masters in Environmental Sciences from Trinity College Dublin (2021), a BSc in Environmental Science from Seattle University (2020), and three years of post-qualification experience in environmental assessment.

4.2. Methodology

4.2.1. Study Area

The WwTP is located in Youghal Co. Cork ca. 1.3 km north from the centre of town and the nearest private residence is located 170m west to southwest of the site. The study area is illustrated in Figure 4.1 Study Area. The study area includes all areas that could potentially be affected by the emissions from the project. The study area was determined using professional judgement and from a consideration of the potential impacts on receptors located near the project. Although potential impacts are not significant across the entire study area, the assessment considers all of these areas in order to demonstrate that sensitive receptors will not be adversely affected by the emissions to atmosphere from the project.

UÉ propose to seek a licence review of the existing WwDL for the Youghal Agglomeration in accordance with regulation 14(1)(b) of the Waste Water Discharge (Authorisation) Regulations, 2007 (as amended).

The project is for the proposed use of Dunn's Park discharge outfall (SW000) as a permanent discharge location. There is no demolition, construction or decommission phases associated with the project. Youghal WwTP is currently using the Dunn's Park discharge outfall as a temporary discharge location.

This Chapter of the EIAR considers air quality effects of the project on receptors which could potentially be affected by the project. The study includes receptors and ecological designated sites that could be affected by the project. The study area for the operational phase air quality assessment was determined using professional judgement and from a consideration of the potential effects on receptors located near the project.

Figure 4.1 - Study Area

4.2.1. Impact Assessment Methodology

Odour and Air Quality Impact Assessment Methodology

The impact assessment methodology involves identification and characterisation of the air quality impacts that may be associated with the project, characterisation of the baseline environment to benchmark the existing situation, quantitative prediction of air quality effects and assessment of the effects against recognised Air Quality Standards (AQS) and guidelines. From this assessment comes a definition of mitigation measures that are required to ensure that all aspects of the effects of the project, through the Operational Phase, are managed and controlled to protect human health, the environment and amenity.

The report meets the requirements of the relevant regulations and has been prepared in accordance with the EPA Guidelines on Information to be contained in Environmental Impact Assessment Reports (EPA, 2022).

The project will:

(i) have regard to the Guidelines on the information to be contained in Environmental Impact Statements, 2022, as appropriate; and,

(ii) 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.

The EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Report were published in May 2022. These Guidelines take account of the revised EIA Directive (2014/52/EU) which are considered in this assessment. Effects are described in the EPA Guidance in terms of quality, significance, magnitude, probability, duration and type. A description of the significance of effects is presented in Table 4.1 and Table 4.2 presents the description of the duration of effects as shown in the Guidelines.

In addition to considering the above guidance, the general approach adopted for the air quality impact assessment is summarised as follows.

i. Describe the existing baseline air quality at the site and in the vicinity of receptors – addressed in Section 4.3;
ii. Describe the potential effects of the project on air quality – addressed in Section 4.4 - 4.7;
iii. Identify appropriate criteria against which to assess the significance of the effects associated with the project – addressed in Section 4.2;
iv. Propose mitigation and avoidance measures where required;
v. Identify and assess all cumulative effects with potential to effects upon the receiving environment.

Table 4.1 - Describing the Significance of Effects from EPA Guidelines

"Significance" is a concept that can have different meaning for different topics – in the absence of specific definitions for different topics the following definitions may be useful.

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.

Table 4.2 - Describing the Duration of Effects from EPA Guidelines

'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.

There are no demolition, construction or decommission phases associated with the project. Youghal WwTP is currently using the Dunn's Park discharge outfall as a temporary discharge location. Consequently there are no construction effects, and no assessment is required.

Odour effects are possible during some elements of work during the Operational Phase. The Institute of Air Quality Management (IAQM, 2014) Guidance on the Assessment of Odour for Planning has been used for the assessment of the odour effects of the project. This Guidance is especially suitable for the assessment of the temporary effects which could arise during the Operational Phase. The methodology adopted for the odour impact assessment study follows the Guidance recommendations of a number of key stages in the odour impact assessment process as follows:

- The magnitude of the potential odour emissions from all sources are identified;
- Sensitive receptors are identified and classified according to their relative sensitivity;
- The magnitude of the odour impact on receptors are identified; and
- The significance of the effect is assessed as either 'Significant' or 'Not Significant'.

Climate impact assessment methodology

The Climate Action and Low-Carbon Development (Amendment) Act 2021, which provides for new arrangements aimed at achieving transition to a low-carbon, climate-resilient and environmentally sustainable economy by 2050, requires that the applicant considers and reduces its carbon footprint in all aspects of a project. This assessment provides information on how the project considers this objective in the selection of the preferred approaches for the project.

The potential climate impact of the project is assessed by comparing the total emissions of Greenhouse Gases (GHG) with those that would occur for the Do Nothing scenario. The principal potential GHG emissions associated with the project are methane (CH_4), nitrous oxide (N_2O) and carbon dioxide (CO_2). For the purposes of this assessment the project is compared with a *Do Nothing scenario* and evaluated. Therefore, 2 scenarios have been assessed as follows:

- Scenario 1 – Do Nothing, in this scenario, the existing discharge outfall continues in use. The use of the temporary discharge outfall, Dunn's Park, remains temporary; and,
- Scenario 2 – Do Something, (the project), in this scenario the existing discharge outfall continues in use. The temporary discharge outfall, Dunn's Park, is proposed as a permanent discharge outfall location.

The assessment estimates the total GHG emissions from direct and indirect activities associated with the project. Overall emissions over the lifetime of the project are considered. The assessment is presented in terms of relative GHG emissions from the various sources and while there are some uncertainties, the assessment allows a reliable comparison of the Climate Impact of the project relative to the Do Nothing scenario.

The Climate Action Plan (CAP) of 2023 describes Ireland's response to the climate crisis. It is integral to the National Development Plan of 2021-2030. Climate solutions are integral to Ireland's continuing social and economic development. At the heart of this issue is system change. Every sector is responsible for driving for a low-carbon transition. The CAP 2023 was considered in the impact assessment for the project.

UÉ also has a climate change policy specifically to design, build, operate and maintain a sustainable wastewater service which was considered in this assessment. This policy is designed to reduce the GHG emissions from waste water treatment plants as well as design plants in a way that is resistant to the effects of climate change.

Air Quality Impact on Ecological Sites

In relation to the interaction of emissions to atmosphere from the project with flora and fauna, Table 4.3 sets out Air Quality Standards (AQS) for the protection of vegetation and ecosystems. This is important as the Blackwater River is a Special Area of Conservation (SAC) and the Blackwater Estuary is a Special Protection Area (SPA), and both the Blackwater River and Estuary are a proposed Natural Heritage Area (pNHA). NOx and SO2 are the relevant pollutants in ecologically sensitive areas. The impact of the emissions is assessed by comparison against the AQS for NO_x and SO_2 for protection of ecosystems and the relevant critical loads for the habitat. Critical levels and critical loads are a quantitative estimate of an exposure of one or more pollutants below which significant harmful effects on specified sensitive environmental receptors do not occur.

4.2.2. Impact Assessment Criteria

The assessment of impact significance is based on a comparison of predicted effects with air quality standards and guidelines, and consideration of the magnitude and duration of the potential impact.

Air Quality Standards in Ireland have been defined to ensure compliance with EC Directives; they are developed at different levels for different purposes. European legislation on air quality has been framed in terms of two categories, limit values and guide values. Limit values are concentrations that cannot be exceeded and are based on WHO guidelines for the protection of human health. Guide values are set as a long-term precautionary measure for the protection of human health and the environment. The World Health Organisation (WHO) guidelines differ from EU air quality standards in that they are primarily set to protect public health from the effects of air pollution, whereas Air Quality Standards are recommended by governments, and other factors such as socio-economic factors, may be considered in setting the standards.

The Clean Air for Europe (CAFE) Directive (Council Directive 2008/50/EC) is an amalgamation of the Air Quality Framework Directive and its subsequent daughter Directives and sets out limit and target values for named air quality parameters. The fourth daughter Directive (European Parliament 2004) also sets out limit values to be met for certain air quality parameters. The CAFE Directive was transposed into Irish legislation by the Air Quality

Standards Regulations 2011 (S.I. No. 180 of 2011). The 4th Daughter Directive was transposed by the Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations 2009 (S.I. no. 58 of 2009).

The air quality standards and guidelines referenced in this report are summarised in Table 4.3. The Clean Air for Europe (CAFE) Directive (Council Directive 2008/50/EC) was transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011). This Directive and the Irish Regulations set out the main standards against which the potential impact of the development on air quality are assessed.

In addition to the Air Quality Standards Regulations and the Directive Standards, it is also appropriate to consider the WHO Guidelines. These guidelines were developed by the WHO to provide appropriate air quality targets worldwide, based on the latest health information available. The air quality guidelines for particulate matter (PM) PM_{10}, $PM_{2.5}$, nitrogen dioxide (NO_2) and sulphur dioxide (SO_2) are considered in this report (WHO, 2021). While the WHO Guidelines are not mandatory, they represent current informed opinion on the levels to which we should be aspiring in order to minimise adverse health effects of air pollution. The WHO guidelines referenced in this report are summarised in Table 4.4.

The Annex of Actions is to be used in conjunction with CAP and the Climate Action and Low-Carbon Development (Amendment) Act 2021 to provide further details on how to achieve Ireland's climate goals (EN/23/12).

The only specific Irish legislation dealing with odour from WwTPs is the European Communities (Waste Water Treatment) (Prevention of Odours and Noise) Regulations 2005 (S.I. No. 787 of 2005), which requires that WwTPs are designed, constructed, operated and maintained in order to avoid causing nuisance arising from odours or noise. The regulations do not define 'nuisance' in terms of a numerical standard, and there is no statutory odour limit or AQS for odour in Ireland.

The EPA's (2020) Air Dispersion Modelling from Industrial Installations Guidance Note (AG4), which includes guidance on appropriate odour standards against which odour emissions may be evaluated, is the most widely used Guidance in Ireland for assessments of this type. This Guidance recognises that the exposure of the population to odour is assessed based on the odour concentration as well as the length of time that the population may perceive the odour. By definition, one odour unit per cubic metre (OUE/m^3) is the detection threshold of 50% of a qualified panel of observers working in an odour-free laboratory using odour-free air as the zero reference, and standards are defined relative to this benchmark.

The EPA has issued guidance specific to intensive agriculture which sets target values for odour for pig-production units of 1.5 to 6.0OUE/m^3 as a 98th percentile of one hour averaging periods. Guidance from the United Kingdom (UK) recommends that odour standards should vary from 1.5 to 6.0OUE/m^3 as a 98th percentile of one hour averaging periods at the site boundary based on the offensiveness of the odour and with adjustments for local factors such as population density. The benchmarks vary depending on the relative offensiveness of odours with a target benchmark of 1.5OUE/m^3 for the most offensive odours, 3OUE/m^3 for moderately offensive odours and 6OUE/m^3 for less offensive odours. The most offensive odour category includes raw sewage and septic sludge, while the moderately offensive odours include such sources as the aeration tanks and clarifiers. Final effluent after treatment is almost odourless and a moderately offensive odour target of 3OUE/m^3 is considered appropriate.

Guidance from New Zealand is based on consideration of the sensitivity of the receiving environment rather than the offensiveness of the odour and specifies odour criteria of 1 to 10OUE/m^3 for the 99.9 to 99.5 percentile if one-hour average ground level odour concentration, with target specifications of 1.0 to 2.0OUE/m^3 for high sensitivity receiving environments. Similar guidance from Europe, especially the Netherlands, sets similar performance criteria.

The target specification is no odour nuisance beyond the project site boundary. Targets for odour nuisance vary as outlined above, but there is a general consensus from relevant guidance that the target performance specification for the 98th percentile of one-hour average concentration should be 1.0 to 3OUE/m^3. The target is set at the boundary, thereby ensuring that there is no odour nuisance to receptors beyond this point.

Table 4.3 - Air Quality Standards Regulations 2011 (based on EU Clean Air for Europe [CAFE] Directive 2008/50/EC)

Pollutant	EU Regulation	Limit Type	Margin of Tolerance	Value
Nitrogen Dioxide	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	None	200 $\mu g/m^3$ NO_2
		Annual limit for protection of human health	None	40 $\mu g/m^3$ NO_2

		Annual limit for protection of vegetation	None	30 µg/m^3 NO +NO_2
Sulphur Dioxide	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 24 times/year	150 µg/m^3	350 µg/m^3
		Daily limit for protection of human health - not to be exceeded more than 3 times/year	None	125 µg/m^3
		Annual & Winter limit for the protection of human health and ecosystems	None	20 µg/m^3
Particulate Matter (as PM_{10})	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50%	50 µg/m^3
		Annual limit for protection of human health	20%	40 µg/m^3
Particulate Matter (as $PM_{2.5}$)	2008/50/EC	Annual limit for protection of human health (Stage 1)	20% from June 2008. Decreasing linearly to 0% by 2015	25 µg/m^3
		Annual limit for protection of human health (Stage 2)	None To be achieved by 2020	20 µg/m^3
Carbon Monoxide	2008/50/EC	8-hour limit (on a rolling basis) for protection of human health	60%	10 mg/m^3 (8.6 ppm)
Benzene	2008/50/EC	Annual limit for protection of human health	0% by 2010	5 µg/m^3

NOTE: The Air Quality Standards Regulations 2011 (SI 180 of 2011) transposed EU Directive 2008/50/EC (CAFE) into Irish law.

Table 4.4 - WHO Air Quality Standards

Pollutant	Averaging time	Interim target				2021 Guidelines
Particulate matter (as $PM_{2.5}$), $\mu g/m^3$	Annual limit for protection of human health	35	25	15	10	5
	24-hour limit for protection of human health Note [1]	75	50	37.5	25	15
Particulate matter (as PM_{10}), $\mu g/m^3$	Annual limit for protection of human health	70	50	30	20	15
	24-hour limit for protection of human health Note [1]	150	100	75	50	45
Ozone, $\mu g/m^3$	Peak season Notes [2]	100	70	NA	NA	60
	8-hour Note [1]	160	120	NA	NA	100
Nitrogen Dioxide, $\mu g/m^3$	Annual limit for protection of human health	40	30	20	NA	10
	24-hour limit for protection of human health Note [1]	120	50	NA	NA	25
Sulphur Dioxide, $\mu g/m^3$	24-hour limit for protection of human health Note [1]	125	50	NA	NA	40
Carbon Monoxide, mg/m^3	24-hour limit for protection of human health Note [1]	7	NA	NA	NA	4

Note [1] Expressed as the 99th percentile

Note [2] Average of daily maximum 8-hour mean O_3 concentration in the six consecutive months with the highest six-month running-average O_3 concentration.

Table 4.5 - Air Quality Impact Assessment Criteria

Pollutant	EU Regulation	Limit Type	Value
Odour	None	Hourly limit for prevention of nuisance – not to be exceeded more than 176 hours per year	3OUE/m^3

4.3. Receiving Environment

4.3.1. Meteorological Conditions

The magnitude of potential effects of the project on air and climate will largely be influenced by the local meteorological conditions, in particular by wind speed and direction, and by precipitation rates. An evaluation of the climatic conditions at the site is therefore useful for an assessment of the type required for this study.

Met Éireann operate a Synoptic Network of weather stations at Belmullet, Malin Head, Rosslare (closed since 2008), Johnstown Castle, Birr, Clones, Kilkenny and Mullingar while the Aviation Division of Met Éireann maintains observing stations at Shannon Airport, Knock Airport, Casement Aerodrome, Dublin Airport and Cork Airport. There is no continuous meteorological monitoring on the subject site but the general guidance on selection of meteorological data for air quality impact assessments is to choose representative data, recently acquired, which best represents conditions at the site. At least three years of recently acquired data is preferred.

Comprehensive monitoring data is available for Cork Airport (ca. 50km west of the subject site) which would be indicative of the meteorological conditions that are experienced at the site. Therefore, for the purpose of obtaining reliable information about the climatological conditions at the site of the project, a full set of meteorological data for the period 2018 – 2020 recorded at Cork Airport was analysed. This is considered an appropriate data set for the study because of the close proximity of the station to the site and the similarity in topography in the immediate area of both Cork Airport and the site of the project.

Wind speed and direction in particular is important in determining how emissions associated with the activity are dispersed. The prevailing wind direction determines which areas are most significantly affected by the emissions from the activity and wind speed determines in part the effectiveness of the dispersion of the emissions.

The windroses for Cork Airport are presented in Figure 4.2 for each of the years 2018 – 2020. The dominant wind direction for Cork Airport is from the southwest quadrant. The wind speed is below 5.14m/s for just under 50% of the time.

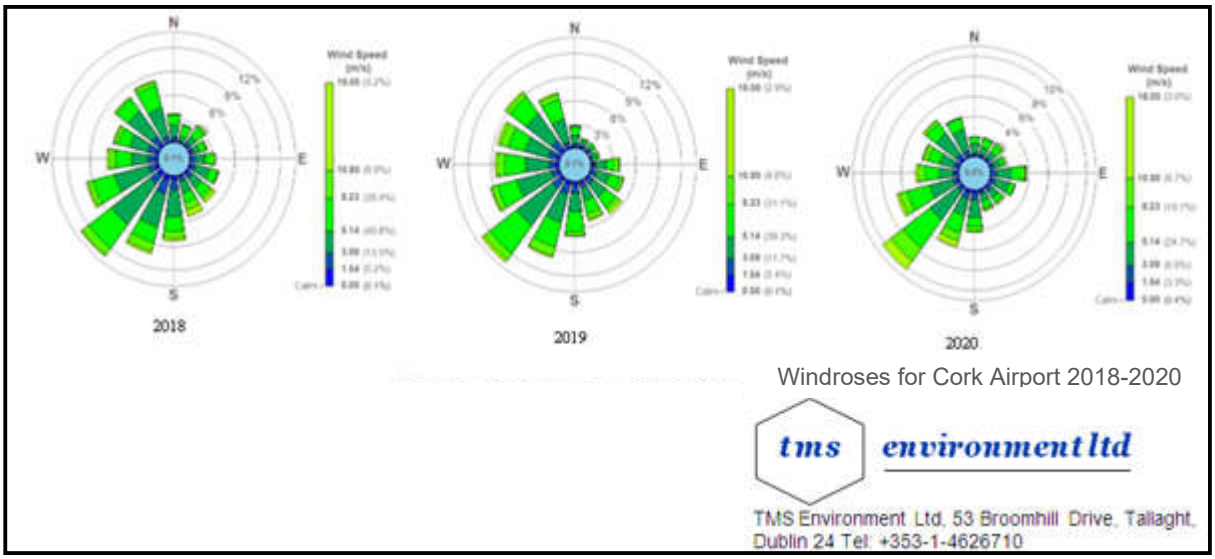


Figure 4.2 - Windroses for Cork Airport, 2018 - 2020 (Met Éireann, TMS Environment)

4.3.2. Influences on Ambient Air Quality

The existing activities at and near the project site have the potential to exert an influence on ambient air quality by release of emissions to the atmosphere as follows:

- emissions of fine PM (PM_{10} and $PM_{2.5}$), SO_2, NO_x, CO from domestic, commercial and industrial heating;
- emissions of fine PM (PM_{10} and $PM_{2.5}$), SO_2, NO_x, CO and benzene from traffic on adjoining roads;
- emissions of dust and PM from agricultural activities.
- emissions of odour, ammonia, and hydrogen sulphide from the existing WwTP and outfall, and from licenced facilities in the area.

Overall, the contribution of traffic to air quality is considered to be the most significant influence on air quality in the immediate vicinity of the project site, but all other sources also exert significant influences on air quality.

The main substances which are of interest in terms of existing air quality are SO_2, NO_x, PM (including PM_{10} and $PM_{2.5}$) which could originate from combustion sources and traffic and odour from existing site activities. A description of existing levels of the various substances in ambient air is required to allow completion of the evaluation of air quality effects associated with the project and is presented in the following Section.

4.3.3. Existing Ambient Air Quality

Air Quality Indicators

The main substances which are of interest in terms of existing air quality potentially affected by the project are odorous substances and odour. Existing air quality indicator parameters are SO_2, NO_x (nitric oxide (NO) and NO_2, collectively referred to as NO_x), fine PM including PM_{10} and $PM_{2.5}$ which could originate from combustion sources, traffic and the existing commercial and industrial activities in the study areas. Carbon monoxide (CO) is also potentially of interest, and benzene (C_6H_6) may also be of interest from traffic sources mainly from R634 ca. 300m from the site. Odour emissions from the waste water treatment are also considered.

Particulate Matter

PM is made up of tiny particles in the atmosphere that can be solid (except for ice) or liquid (except for water) and is produced by a wide variety of natural and manmade sources. PM includes dust, dirt, soot, smoke and tiny particles of pollutants. PM of 10 micrometres (µm) in aerodynamic diameter or less is also referred to as PM_{10} or, more strictly, particles which pass through a size selective inlet with a 50% efficiency cut-off at 10 µm aerodynamic diameter. Similarly, $PM_{2.5}$ refers to PM of 2.5 µm or less in aerodynamic diameter. In the past,

domestic coal burning was a major source of PM in Irish cities during winter months. Levels of particles have decreased significantly following the introduction of abatement strategies including Special Control Areas and other Regulations regarding the use, marketing, sale and distribution of certain fuels. PM is significant in relation to air quality is predominantly related to negative human health and respiratory effects.

Nitrogen Oxides

NO_x, which is the sum of NO and NO_2, are generated primarily by combustion processes. The main anthropogenic (man-made) sources are mobile combustion sources (road and air traffic) and stationary combustion sources (including industrial combustion and domestic heating). The main source of NO_x near the project study area is traffic. The significance is health-related for NO_2 and ecological-related for NO_x. Nitrous oxide emissions may also be associated with the operation of the WwTP.

Sulfur Dioxide

SO_2 also originates from combustion but predominantly from heating sources and not traffic. The trend in ambient SO_2 concentrations is clearly downward and this pollutant is not a matter for concern in Ireland. The reduction in ambient SO_2 concentrations in recent years can be attributed to fuel switching from high-sulfur content fuels, such as coal and oil, to natural gas and to decreases in the sulfur content of oil.

Carbon Monoxide

CO is a colourless and odourless gas, formed when carbon in fuel is not burned completely. It is a component of motor-vehicle exhaust, which accounts for most of the CO emissions nationwide. Consequently, CO concentrations are generally higher in areas with heavy traffic congestion. CO is also a significant emission from air traffic.

Carbon Dioxide

CO_2 may be emitted from any combustion sources which include road and air traffic, and commercial and domestic heating.

Odour

The principal odorous gases potentially present in emissions from the WwTP include various organic substances, ammonia, hydrogen sulfide, traces of methane and organic nitrogen compounds. Where available, data for existing levels of these substances in ambient air are discussed in the Long Term Air Quality Data and Odour Baseline sections.

There is a Waste Transfer Station (Licence Reg W0211-02) and Youghal Landfill (Licence Reg W0068-03) located north of the site ca. 427m from the site boundary. These facilities are located predominantly downwind of the WwTP and at a distance which is unlikely to lead to measurable cumulative impacts. Potential impacts are considered in the existing baseline assessment.

Long Term Air Quality Data

A description of existing levels of the various substances in ambient air is required to evaluate air quality effects associated with the project. The available data from the National Ambient Air Quality Network is a reliable data set for consideration in this study.

The EPA and local authorities maintain and operate a number of ambient air quality monitoring stations throughout Ireland in order to implement EU Directives and to assess the country's compliance with national air quality standards. Ireland's small population and generally good air quality means that a relatively small number of monitoring stations are sufficient across the country for the purposes of implementing the EU Air Directives. For ambient air quality management and monitoring in Ireland, four zones, A, B, C and D are defined in the Air Quality Standards (AQS) Regulations (S.I. No. 180 of 2011) and are defined as follows:

- Zone A: Dublin Conurbation;
- Zone B: Cork Conurbation;
- Zone C: 24 cities and large towns. Includes Galway, Limerick, Waterford, Clonmel, Kilkenny, Sligo, Drogheda, Wexford, Athlone, Ennis, Bray, Naas, Carlow, Tralee, Dundalk, Navan, Newbridge, Mullingar, Letterkenny, Celbridge and Balbriggan, Portlaoise, Greystones and Leixlip; and,
- Zone D: Rural Ireland, i.e. the remainder of the State excluding Zones A, B & C.

The subject site is located in Zone D and is considered a rural location site for assessment purposes. Air Quality Data from representative air monitoring stations in Zone D are therefore considered representative of air quality at the subject site. The EPA publishes Ambient Air Quality Reports every year which details the air quality in each of the four zones. The most recent report, published by the EPA in 2022, is the Air Quality in Ireland 2021, which contains monitoring data collected during 2021. Best practice requires that an average of at least three years of recent monitoring data is used for assessments of this type, so data for 2019, 2020, and 2021 has been reviewed.

The EPA maintains monitoring stations in a number of rural locations including Castlebar, Claremorris, Emo, Enniscorthy, Kilkitt and Longford to monitor rural background air quality. There are other monitoring stations, but long-term data is available for the above stations. Data from the Air Quality Monitoring Annual reports for 2019 - 2021 were reviewed and a summary of the data for representative stations for the three most recent years for each parameter of interest is presented in Table 4.6.

The approach used is to take the average of the three most recent years for each of the Zone D rural stations detailed above and the averages of the values for the stations within Table 4.6. This is the data set which is used in the assessment of the potential impact of the project on air quality. A graphical presentation comparing the data with the relevant Air Quality Standards (discussed further in Section 4.5 below) and presented in Figure 4.3.

It is noted from the data that existing ambient air quality is good for all health-related pollutants. All concentration levels are within the EU Standards for all parameters of interest.

Table 4.6 - Summary baseline air quality data (2019 - 2021)

Data set	Parameter and averaging interval		Concentration µg/m^3
Rural background	Nitrogen dioxide NO_2	Annual Mean, µg/m^3	6.9
Rural background	Nitrogen oxides, NO_x	Annual Mean, µg/m^3	12.6
Rural background	Particulate Matter PM_{10}	Annual Mean, µg/m^3	12.5
Rural background	Particulate Matter $PM_{2.5}$	Annual Mean, µg/m^3	8.6
Rural background	Sulphur dioxide, SO_2	Annual Mean, µg/m^3	3.8
Rural background	Carbon Monoxide CO	Annual Mean 8-hour, mg/m^3	0.35
Rural background	Benzene	Annual Mean, µg/m^3	Note 2

NOTE

1. Data summarised from the EPA Annual Ambient Air Quality Monitoring Reports 2019 to 2021.
2. No Zone D measurements recorded during this interval but a value of 0.1 *µg/m^3 was recorded for Zone C.*

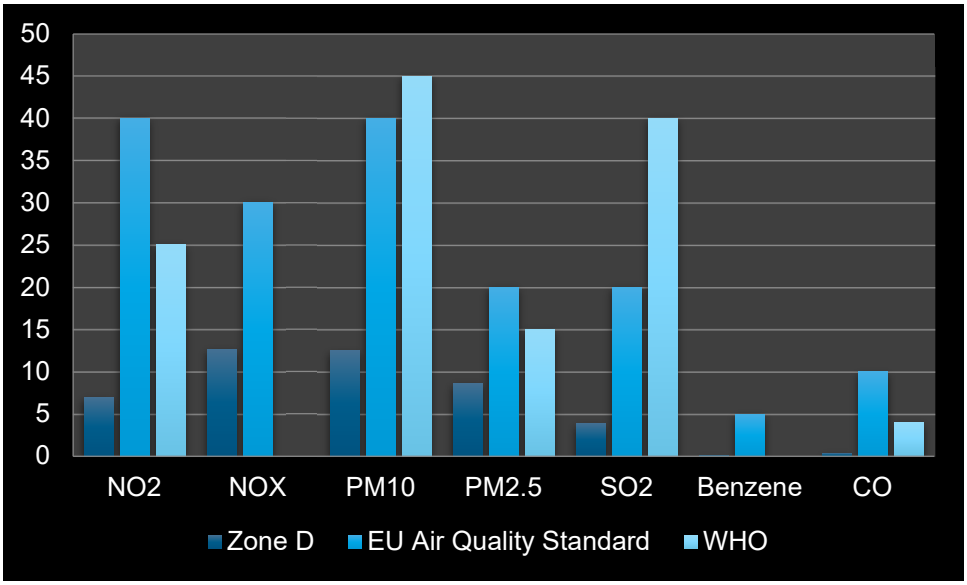


Figure 4.3 - Comparison of baseline air quality data with Air Quality Standards

Odour Baseline

A site visit was completed on the 13th of October 2022. The project and areas in the vicinity of the site were inspected. Assessments were completed in accordance with EPA Guidance AG5 Odour Impact Assessment Guidance for Licensed Sites (2021). The assessments were carried out on two separate occasions, on the same day, at the roadway into the WwTP, at the shore upwind and downwind of the existing discharge outfall which it is proposed to retain. The monitoring locations and summary of findings are shown in Figure 4.4. No odour was detected at any of the locations.

On-site and boundary assessments were also completed during the site inspection. There was no odour detected at the site boundaries or at any of the final effluent locations. A slight odour was detected beside the sludge handling activity and beside the odour abatement system inside the WwTP site boundary, but this slight odour dissipated at 5m from the odour source. There were no off-site odours detected on the date of the survey. Details of the assessments are included in Appendix 4.1.

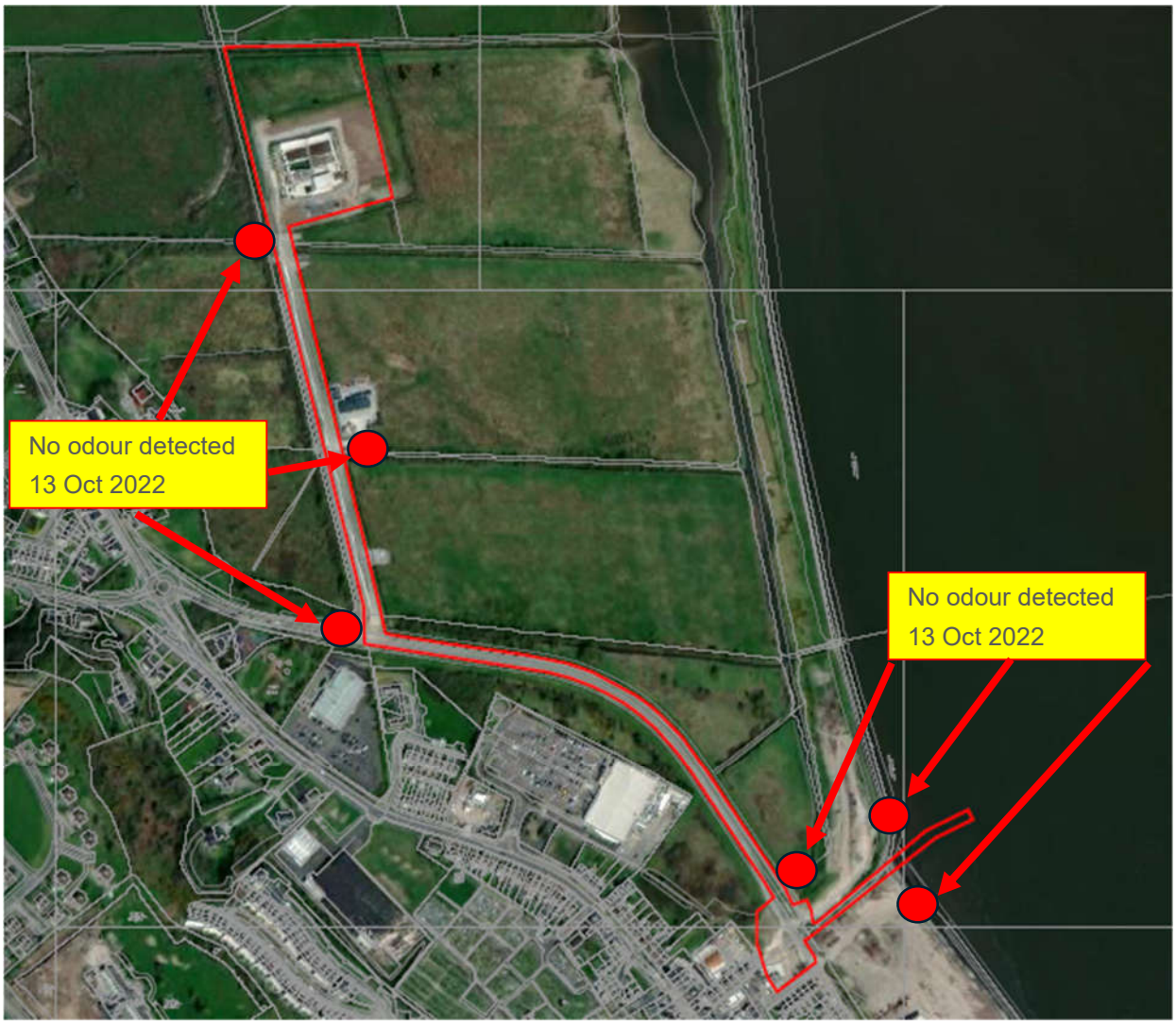


Figure 4.4 - Odour monitoring locations and results

4.4. Potential Effects on Air Quality & Climate during Construction Phase

The project is for the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge location outfall for the discharge of treated effluent. There is no demolition, construction or decommission works associated with the project so there are therefore no construction phase effects.

4.5. Potential Effects on Air Quality & Climate during Operational Phase

The project is for the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge location outfall. Since no changes are proposed, the existing situation will continue and there will be no change in the nature or quantity of emissions as a result of the project. The existing air quality is good as set out in section 4.3 and no change is expected as a result of the project. Any minor emissions which currently occur are predicted to continue unchanged. This applies to any potential emissions, including greenhouse gases.

Transport Emissions

There is an imperceptible effect on air quality and climate associated with the removal of the sludge and non-sludge waste. There is ca. one load per week of sludge removal and one load of non-sludge waste removal. This is 1-2 vehicles per week and one employee per day. This amount of traffic does not exert a measurable impact on air quality.

Air Quality Impact on Ecological Sites

Critical levels and critical loads are a quantitative estimate of an exposure of one or more pollutants below which significant harmful effects on specified sensitive environmental receptors do not occur. The critical level for NOx for ecological sensitive sites, like Blackwater River SAC and Blackwater Estuary SPA, is 30µg/m3 and for SO2 is 20 µg/m3 expressed as an annual average. Any emissions of NOx from the very low traffic levels associated with the existing WwTP does not exert a measurable influence on air quality. There is no other potential for emissions of NOx or SO2 associated with the project.

Since the project does not emit these pollutants and the emissions from low traffic levels associated with the project are minimal, the significance of NOx and SO2 emissions can be considered imperceptible in terms of their potential harmful effects on specified sensitive environmental receptors.

Climate Impact

There are negligible levels of emissions of greenhouse gases such as carbon dioxide, nitrous oxide and methane associated with the project. Therefore, the project's emissions will not contribute significantly to climate change or have any discernible influence on the overall climate conditions. Since the emissions associated with the project are considered imperceptible, their effect on climate can also be regarded as imperceptible. There is no difference in GHG emissions between the two scenarios assessed.

UÉ also has a Sustainable Energy Strategy (UÉ, 2023) which sets out the commitment to becoming an energy efficient, low carbon and sustainable water utility. UÉ's sustainable energy strategy targets are as follows:

- 50% increase in energy efficiency by 2030;
- 40% energy demand met by installed renewables by 2035; and,
- 51% absolute decrease in greenhouse gas (GHG) emissions from thermal and transport energy sources by 2030.

The project does not set out specifically to make contributions to each of these targets. However, there will be a minor decrease in GHG emissions from transport as a result of implementing this project rather than any alternative project involving construction of a new outfall.

4.6. Potential Effects on Odour during Construction Phase

There is no demolition, construction or decommission phases associated with the project. There are therefore no potential odour effects to be assessed.

4.7. Potential Effects on Odour during Operational Phase

4.7.1. WwTP Treatment stages

The WwTP is designed for biological treatment capacity of 16,000 PE. Odour emissions may potentially arise at all stages of the treatment process and therefore an assessment is conducted to evaluate the potential for such emissions and to evaluate the significance of the odour effects.

The treatment stages comprise the following:

- Inlet works providing screening, grit removal, and fat, oil and grease (FOG) removal;
- A screened stormwater overflow (2 No. storm tanks);
- Four Sequence Batch Reactor (SBR) tanks for Biochemical oxygen demand (BOD) removal and Nitrification;

- Balance tank for treated wastewater;
- Final effluent pumps;
- Sludge treatment facilities include a picket fence thickener, a sludge dewatering system and a sludge storage tank; and,
- UV treatment of the final effluent.

There is a Pumping Station at Dunn's Park consisting of 3 no. low level foul pumps and 2 no. high flow pumps which convey the wastewater to the inlet works.

The principal features of the treatment stages are summarised in the following sections.

- Preliminary Treatment includes screening, de-gritting and grease removal. The tank is aerated to assist grit removal and units operate in duty / standby mode.
- There are four identically sized Sequential Batch Reactors (SBRs) that are operated on a predetermined schedule. The SBR cell contents are mixed without aeration, to provide an anoxic environment to facilitate nitrification. After a short period, aeration is provided by fine bubble diffusers and blowers to achieve BOD removal. Only two tanks can be in "Aerate" mode at any given time. Once aeration has finished, the Settlement phase begins, followed by Decanting of the clarified effluent.
- Treated effluent from the SBRs enters the final balance tank and from there it is pumped to the discharge at the outfall. The pumps operate in duty / standby mode.
- The final effluent currently outfalls to the existing sea outfall Dunn's Park (SW000) which comprises a 750mm diameter outfall to the Lower Blackwater M Estuary.

Towards the end of the decant phase, Waste Activated Sludge (WAS) is removed from each of the SBR cells via WAS pumps which operate continuously during the waste period and conveyed to the picket fence thickener. Sludge is then pumped to the centrifuge for dewatering. The pumps are positive displacement and operate in a duty / standby mode. The sludge cake then enters a skip to be removed off site.

There are a number of possible sources of emissions to atmosphere during the Operational Phase from the various elements of the existing WwTP as summarised in Table 4.7. The significance of these emissions is also assessed and described in Table 4.7.

Table 4.7 - Sources of Emissions From the WwTP to Atmosphere

Element and Emission Sources	Potential Emissions	Significance of emissions
Inlet works	Odour Hydrogen sulfide (H_2S), ammonia, organic substances	Significant. The inert works are covered thereby effectively containing the emissions for treatment in an activated carbon Odour Control System. Existing mitigation ensures that odours / emissions do not reach the site boundary.
Preliminary treatment	Odour Hydrogen sulfide (H_2S), ammonia, organic substances	Significant. The works are covered thereby effectively containing the emissions for treatment in an activated carbon Odour Control System. Existing mitigation ensures that odours / emissions do not reach the site boundary.
Sludge handling		
Picket fence thickener	Odour Hydrogen sulfide (H_2S), organic substances	Significant. This tank is open to the atmosphere but because of the nature of the process, and a significant freeboard volume, odours are not routinely detected at the top of the tank.
Centrifuge	Odour Hydrogen sulfide (H_2S), organic substances	Significant. The centrifuge is housed in a building and the odours are captured and treated in an odour abatement system. Existing mitigation ensures that odours / emissions do not reach the site boundary.

Skip	Odour Hydrogen sulfide (H_2S), organic substances	Significant. The skip has a small manhole-size breather vent that is opened for inspection and to allow for discharge of displaced air. The skips are removed when full and do not lead to odorous emissions detection at site boundary.
Final discharge	Odour	Insignificant. After treatment the odour of the final effluent is insignificant and is generally not detectable.

H_2S, ammonia, organic substances, and odour emissions from WwTPs can have several impacts on the environment, public health, and surrounding communities. Inhalation of high concentrations of H_2S or ammonia gas can cause health effects such as respiratory irritation and odour nuisance, and organic substances present in WwTP emissions could, in some cases, pose health risks if exposed to humans. Odour emissions from WwTPs can cause nuisance and discomfort to nearby residents and businesses.

The existing treatment plant operates effective controls, all of which follow standard design measures, and do not lead to detectable odours beyond the site boundary during routine operation providing minimizing the potential impacts the treatment plant. The plant is not operating at full capacity; from the 2021 AER, the current collected load is 11,528 PE out of its capacity of 16,000.

The Odour Complaints Register for 2020 – 2022 was reviewed and 12 complaints were logged. Two of the complaints were not traced to an identifiable cause, 6 of the complaints resulted in work being done outside the plant on the main drainage systems and there were no issues identified for the remainder. A trend has been observed in relation to some complaints that links complaints to third party contractors tipping waste from private sources into the public drainage system and this has led to notifications being issued to the contractors to refrain from such activity.

There have been no complaints logged in relation to the discharge of final effluent which is consistent with expectations given the treatment stages involved and the quality of the final effluent. The project is for the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge location outfall. There will be no change to the characteristics of the emissions from any stage of the treatment process as a result of the project. Therefore, there is no change in odour effect predicted as a result of the project. The impact of the project will be neutral, imperceptible and long term.

4.8. Do Nothing Scenario

In this scenario, the existing discharge would remain temporary and the WwTP will continue to operate in its current format and capacity. This scenario does not involve any new works since it relates only to continuing the existing discharge outfall. The existing monitoring occurring onsite as part of the existing WwDL licence (Reg No. D0139-01) at the WwTP results in a non-odorous final effluent at the discharge point. Due to there being no changes, there would be no change in terms of environmental impact in relation to air quality, odour, and climate.

4.9. Cumulative Effects

The cumulative effects of the project in conjunction with current and future developments in the vicinity of the subject site are considered in this section.

Air, Odour, and Climate were assessed against the projects listed in Table 13.1 of Section 13. This table contains relevant projects that have planning permissions as well as nearby EPA licence sites and developments.

The most relevant nearby sites are the Waste Transfer Station (Licence Reg W0211-02) and Youghal Landfill (Licence Reg W0068-03). These sites are located north of the site ca. 427m from the closest site boundary. These sites may emit odour into the environment; however, these facilities are located predominantly downwind of the WwTP and at a distance which is unlikely to lead to measurable cumulative impacts.

The construction of dwellings, a solar farm, and electricity developments will not have a measurable cumulative impact on air and climate. The combined emissions and effects from these activities are expected to be minimal and not significantly contribute to changes in air quality or climate.

The construction of dwellings, a solar farm, and electricity developments do not contribute to odour emissions, so these additional developments will not have any cumulative impact on odour associated with the WwTP.

There will be no significant adverse air quality, climate, or odour impacts on the receiving environment as a result of the project or in conjunction with other local developments that are planned for the area.

4.10. Human Health Effects

Air Quality Standards (AQS) are set to protect vulnerable people, such as those with respiratory illnesses, the elderly and infirm. Hence, the human health impact assessment has relied on compliance with the AQS to determine whether significant effects will arise on human health or not. There will be no significant emissions to atmosphere during the Operation Phase and the impact has been assessed as neutral imperceptible and long term. Therefore, the potential human health effect during operation is imperceptible.

4.11. Mitigation Measures

The project is for the proposed use of Dunn's Park as a permanent discharge location outfall. The project does not involve any new works since it relates only to continuing the existing discharge outfall. The existing monitoring occurring onsite as part of the existing WwDL licence (Reg No. D0139-01) at the WwTP demonstrates a non-odorous final effluent at the discharge point, thereby demonstrating that any existing mitigation measures are effective.

4.12. Residual Effects

The existing monitoring occurring onsite as part of the existing WwDL licence (Reg No. D0139-01) has been shown to be effective in the management of air quality and odour effects associated with the project. The comprehensive mitigation and management existing at the WwTP will ensure that there are no significant residual effects. The residual effects of the project will be neutral, imperceptible and long term.

4.13. Monitoring Requirements

As part of the Wastewater Discharge Licence (Reg No. D0139-01), the WwTP has set Emissions Limit values for the wastewater that is treated and discharged from the site. Youghal WwTP investigates all odour complaints received from the public. They do so to find out the source of the odour, if it is caused by the plant or pipes malfunctioning, or if it is caused by illegal dumping. The WwTP operators remediate these issues by deep cleaning the affected area and removing potential blockages if deemed required. The vast majority of odour at the WwTP will dissipate before reaching the public, as the treatment plant is well away from public areas with the closest being 170m west to southwest of the site. No other monitoring is required.

4.14. Difficulties Encountered

There were no specific difficulties encountered when carrying out this assessment.

5. Noise & Vibration

5.1. Introduction

This section assesses the potential noise and vibration effects associated with the proposed use of temporary discharge outfall, Dunn's Park, as a permanent discharge outfall from Youghal WwTP in Co. Cork.

The assessment includes a description of the receiving ambient noise climate in the vicinity of the subject site, an assessment of the potential noise and vibration effect associated with the permanent operation of the outfall on its surrounding environment.

The noise and vibration assessment has been prepared by Jennifer Harmon (Associate) who holds a BSc (Hons) in Environmental Science, a Diploma in Acoustics and Noise Control, and is a member of the Institute of Acoustics (MIOA). She has worked in the field of environmental noise impact assessment since 2001 and has extensive knowledge in the field of occupational noise risk assessments, environmental noise and vibration impact assessment and inward impact assessments for a wide range of project types including transport, industrial, commercial and residential.

Chapter 2 (Project Description) provides the detail of the description of the project.

5.2. Methodology

5.2.1. Assessment Overview

The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. This application is seeking consent to make the discharge outfall permanent. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. On this basis, there are no potential noise or vibration effects at any of the Noise Sensitive Locations (NSLs) in the vicinity associated with any construction phase. Therefore there are no associated effects and hence this phase has been scoped out of further assessment.

The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WwTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP hence no changes to the noise environment from the existing WwTP facility will occur. There are no noise sources associated with the Dunn's Park outfall. The EIAR is therefore only concerned with the potential operational effects associated with the current discharge.

This assessment has been undertaken using the following methodology:

- A review of relevant guidance and standards has been undertaken to identify appropriate noise and vibration criteria relevant to the existing facility to assess against best practice guidance;
- An environmental noise survey was undertaken to characterise the prevailing noise environment at the closest NSLs to the existing WwTP and Dunn's Park discharge outfall to establish the contribution, if any, of the existing operation to the ambient noise environment;
- An assessment of operational noise levels against the appropriate identified criteria and existing noise levels has been undertaken; and,
- An assessment of the potential noise and vibration impacts of the continued operations has been undertaken alongside any potential cumulative impacts with surrounding planned or permitted developments in place.

The existing WwTP is licenced by the EPA under discharge licence (Reg No. D0139-01). The licence does not include any noise Emission Limit Value (ELVs). The licence notes:

> "*the legislation governing this licence relates specifically to, and is restricted to, the regulation and control of waste water discharges from the agglomeration. Therefore any odour or noise issue that may be associated with the waste water works including the treatment plant cannot be addressed by this licence*"

In the absence of any noise ELV's set for the facility, reference has been made to the EPAs document *Guidance Noise for Noise: Licence Applications, Surveys and Assessments in relation to Scheduled Activities (NG4)* 2016 to review typical operational noise limits associated with similar facilities.

Noise Criteria: EPA: NG4

The NG4 (2016) guidance document includes typical operational noise levels for scheduled activities when a facility has been screened out as a quiet area or an area of low background noise.

The WwTP does not satisfy the criteria for a 'Quiet Area' defined in Section 4.4.2 of the NG4 (2016) document due to the proximity of adjacent population areas. The area does not meet the criteria for an area of 'Low Background Noise' defined in Section 4.4.2 of the NG4 (2016) based on the results of the baseline noise survey (See Section 5.3) due to road traffic being the dominant noise source of background and ambient noise within the vicinity of the Youghal WwTP. The following standard noise ELVs would therefore typically be applied for a facility of this nature. The ELVs typically are set at noise sensitive properties in the vicinity of an operational licenced facility:

- Daytime (07:00 – 19:00hrs): 55 dB $L_{AR,T}$ [7]
- Evening (19:00 - 23:00hrs): 50 dB $L_{AR,T}$
- Night-time (23:00 – 07:00hrs): 45 dB $L_{Aeq,T}$ [8]

The WwTP operates on a continual 24/7 basis as does the outfall discharge at Dunn's Park. Noise emission limits would not apply to an outfall discharge as standard due to the absence of any notable noise sources. The ELVs discussed above would relate to the operation of the WwTP facility.

Operational Vibration

There are no sources of vibration associated with the operation of the existing WwTP or discharge outfall. The continued operations of the facility will not give rise to any levels of vibration off site and therefore the associated effect is not significant and not considered further.

Assessment of Significance

The following sets out the approach for categorising the significance associated with any change in the noise environment as a result of the project.

The *'Guidelines for Environmental Noise Impact Assessment'* produced by the Institute of Environmental Management and Assessment (IEMA) (2014) have been referenced in order to categorise the potential effect of changes in the ambient noise levels during the operational phases of the project.

The guidelines state that for any assessment, the potential significance should be determined by the assessor, based upon the specific evidence and likely subjective response to noise. Due to varying factors which effect human response to environmental noise (prevailing environment, noise characteristics, time periods, duration and level etc.) assigning a subjective response must take account of these factors.

The scale adopted in this assessment is shown in Table 5.1 and is based on an example scale within the IEMA guidelines. The corresponding significance of effect presented in the *'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports'* (EPA, 2022) is also presented.

Table 5.1 – Scale of Noise Effects – Operational Noise Sources

Noise Level Change	Subjective Response	Classification of Effects (IEMA)	EPA Classification of Effect
<0	No Change	Negligible	Imperceptible
≥ 0 and < 3	Barely perceptible		Not Significant
≥ 3 and < 5	Noticeable	Minor	Slight Effect
≥ 5 and < 10	Up to a doubling or halving of loudness	Moderate	Moderate Effect
≥10	More than a doubling or halving of loudness	Major	Significant to Profound Effect

The significance table reflects the key benchmarks that relate to human perception of sound. A change of 3 dB(A) is generally considered to be the smallest change in environmental noise that is perceptible to the human ear. A 10 dB(A) change in noise represents a doubling or halving of the noise level. The difference between the minimum perceptible change and the doubling or halving of the noise level is split to provide greater definition to the assessment of changes in noise level. The IEMA document does not distinguish effects beyond those categorised as 'Major'. For the purposes of distinguishing between Significant and Profound effects to align with EPA 2022

[7] $L_{AR,T}$ - The Rated Noise Level, equal to the L_{Aeq} during a specified time interval (T), plus specified adjustments for tonal character and/or impulsiveness of the sound.

[8] $L_{Aeq,T}$: This is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period (T).

categorisation of effects, changes in noise levels greater than 20 dB are categorised Profound. Between 10 and 20 dB impacts are of increasing effect between Significant and Very Significant.

5.3. Receiving Environment

The Youghal WwTP is located ca. 1.3km north of Youghal town in an area called the Mudlands. The facility is surrounded on all boundaries by greenfield lands. The closest Noise Sensitive Locations (NSLs) to the site are residential properties ca. 170m west to southwest of the site and 370m south-east off the R634 Road.

The Dunn's Park discharge outfall is ca. 850m southeast of the WwTP. The nearest NSLs to the discharge outfall are residential properties located along the R634 Road, ca. 200 meters west of the outfall.

The prevailing noise environment has been characterised through a baseline noise survey. Baseline noise monitoring was undertaken by AWN consulting in October 2022 at the WwTP site boundary and at 3 locations external to the site to characterise the prevailing noise environment representative of the closest NSLs. The surveys were conducted in general accordance with ISO 1996: 2017 Acoustics – Description, measurement and assessment of environmental noise. Survey details are set out in the following sections.

5.3.1. Survey Locations

The measurement locations were selected to represent the noise environment at the closest NSLs to the existing WwTP and outfall. All surveys were undertaken during daytime periods when the facility was in normal operation. The selected locations are shown in Figure 5.1 and described as follows:

WwTP Site Boundary

N1 This location was selected to measure operational noise levels from the WwTP facility to determine its contribution at off-site NSLs. The measurement position was located along the southern site boundary adjacent to the entrance gate. Two rounds of attended measurements were carried out at this location.

Noise Sensitive Locations

N2 This location was selected to capture the noise environment at properties to the south of the WwTP. The monitoring location was mid-way along the access road to the WwTP facility opposite the rear facades of the closest properties along this road. Three rounds of attended measurements were undertaken at this location.

N3 The monitoring position was along R634 road edge, adjacent to a row of residential properties. Three rounds of attended measurements were carried out at this location.

N4 This location was selected to capture the noise environment along the Breton Road opposite the Dunn's Park outfall. Three rounds of attended measurements were carried out at this location.

Figure 5.1 – Noise Survey Locations

5.3.2. Measurement Parameters

The noise survey results are presented in terms of the following parameters:

L_{Aeq} is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.

L_{A10} is the sound level that is exceeded for 10% of the sample period. It is typically used as a descriptor for traffic noise.

L_{A90} is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

L_{AFmax} is the instantaneous maximum sound level measured during the sample period using the 'F' time weighting.

The "A" suffix for the noise parameters denotes the fact that the sound levels have been "A-weighted" in order to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to 2 x 10-5 Pa.

5.3.3. Survey Periods

The noise survey was conducted on the 25th and 26th of October 2022. Weather conditions during all survey periods were mixed with low and dense cloud cover. Temperatures were between 10°C and 14°C and, wind speeds were in the range of 4 and 5 m/s, with occasional gusts exceeding 7 m/s. The measurements were paused where possible during elevated wind speeds. Measurement periods were 15 minutes at each location.

5.3.4. Personnel and Instrumentation

All attended measurements were carried out by AWN personnel. The following instrumentation was used in conducting the noise surveys:

Table 5.2 – Instrumentation Details

Equipment	Type	Serial Number	Calibration Date
Sound Level Meter	Rion NL-52	575782	12/07/2021
Calibrator	Brüel & Kjaer 4231	2205805	03/05/2022

5.3.5. Survey Results

The results of the attended noise surveys are summarised in Table 5.3 to Table 5.6. The average noise level for the L_{Aeq} parameters is calculated as an logarithmic average whilst an arithmetic average is used for the L_{A10} and L_{A90} parameters.

5.3.5.1. Location N1 (Site Entrance – South)

The survey results for the boundary location of the WwTP are summarised in Table 5.3.

Table 5.3 – Survey Results at Location N1

Date/ Start Time	Measured Noise Levels, dB			
	L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
25/10/2022 14:48	46	68	47	42
25/10/2022 15:03	46	59	47	43
Average	46	65	47	42

During the survey periods the main contributor to the measured noise levels was a combination of noise sources in the environment surrounding the WwTP. The main noise build-up included site entrance gate opening/closing, constant bird song, traffic along the R364 Road and constant distant road traffic along the N25 Road. In addition, occasional vehicles turning driving up and turning and dog walkers were occasional sources of noise along the site access road. On-site plant sources were audible at low levels. The ambient noise levels measured 46 dB $L_{Aeq,\ 15mins}$ and background noise levels were measured in the range of 42 to 43 dB $L_{A90,15mins}$.

5.3.5.2. Location N2

Survey results recorded at Location N2 are summarised in Table 5.4

Table 5.4 – Survey Results at N2

Date/ Start Time	Measured Noise Levels, dB			
	L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
25/10/2022 15:24	47	63	49	40
25/10/2022 16:34	50	75	53	43
25/10/2022 18:11	49	63	52	42
Average	49	70	51	42

The primary noise contributors at Location N2 were road traffic along the R634 Road, distant road traffic noise from the N25 Road, rustling leaves and bird song. The operation of the Youghal WwTP or Dunn's Park discharge outfall were not audible during any of the survey periods at this monitoring location.

The ambient noise levels at this location in the were measured in the range of 47 to 50 dB $L_{Aeq,15mins}$. The background noise levels measured were in the range of 40 to 43 dB $L_{A90,15mins}$.

5.3.5.3. Location N3

Survey results recorded at Location N3 are summarised in Table 5.5.

Table 5.5 – Survey Results at N3

Date/ Start Time	Measured Noise Levels, dB			
	L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
25/10/2022 17:15	72	85	77	55

26/10/2022 09:42	73	87	77	53
Average	72	84	75	53

The noise contributors at location N3 were road traffic along the R634 Road and rustling vegetation during wind gusts. The WwTP or Dunn's Park discharge outfall were not audible during any of the survey periods at this location. The ambient noise levels at this location were measured in the range of 72 to 73 dB $L_{Aeq,15mins}$. The background noise levels measured were in the range of 53 to 55dB $L_{A90,15mins}$.

5.3.5.4. Location N4

Survey results recorded at Location N4 are summarised in Table 5.6.

Table 5.6 – Survey Results at N4

Date/ Start Time	Measured Noise Levels, dB			
	L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
25/10/2022 16:11	60	80	63	44
25/10/2022 17:36	57	71	61	46
26/10/2022 10:03	53	69	57	45
Average	57	76	61	45

The noise contributors at location N4, along the Breton Road opposite the Dunn's Park discharge outfall was road traffic, dog walkers and pedestrians passing. Both birdsong and leaf rustle were also noted contributors to the noise environment at this measurement location. The operation of the WwTP or the discharge outfall were not audible at this location and did not contribute to the measured noise levels. The ambient noise levels were measured in the range of 53 to 60 dB $L_{Aeq,15mins}$. The background noise levels measured were in the range of 44 to 46 dB $L_{A90,15mins}$

5.3.5.5. Summary of Baseline Noise Surveys

The site boundary measurements at the entrance gate to the WwTP (Location N1) were measured with plant in normal operation provide a footprint for baseline noise environment in the vicinity. The noise levels measured at the WwTP boundary were low with minimal contribution from operational plant noise.

The ambient and background noise levels measured at Location N1 are within the day, evening and night-time noise emission limits that would typically apply to an operational licenced facility. The relevant ELVs are typically applied at the nearest off-site NSLs. Taking account of the distance to the nearest NSLs to the facility, some 170m west, the noise contribution from the operational WwTP is well below typical noise ELVs. There was no noise contribution from the Dunn's Park discharge outfall at Location N1.

Operational activities from the WwTP or Dunn's Park discharge outfall were not audible at the closest NSLs during the baseline noise surveys. At location N2, the closest off-site monitoring position to the WwTP facility, background noise levels measured an average value of 42 dB L_{A90}. Whilst the WwTP was not audible at this location, the measured background noise levels were below the relevant day, evening and night-time noise values discussed in Section 5.2. The main sources of noise in the surrounding environment are from local road traffic and birdsong.

At location N4, the closest off-site monitoring position to the Dunn's Park discharge outfall, the noise environment was also dominated by road traffic. No sources of noise were observed from the discharge outfall and its operation did not contribute to measured noise levels at this monitoring location.

The operation of the WwTP and the discharge outfall, therefore, do not contribute any notable noise levels to the NSLs in their vicinity and comply with standard guidelines that would typically apply for noise in their surrounding environments.

5.4. Do Nothing Scenario

In the Do Nothing Scenario, the current operations of the Dunn's Park discharge outfall will continue to operate as a temporary discharge point. The prevailing noise environment as measured, will remain unchanged.

5.5. Potential Noise Effects during Construction Phase

There is no demolition, construction or decommission phases associated with the project. Youghal WwTP is currently using the Dunn's Park discharge outfall as a temporary discharge location. Therefore there are no potential noise or vibration effects in this case as there is no construction taking place.

5.6. Potential Noise Effects during Operational Phase

The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WwTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP, hence no changes to the noise environment from the existing WwTP facility will occur. There are no noise sources associated with the discharge outfall.

The existing WwTP consists of the following main elements:

- Inlet Pumping Station;
- Preliminary Treatment;
- Sequential Batch Receptors (SBRs);
- Final Effluent Balance Tank;
- Final Effluent;
- Sludge Treatment;
- Secondary Discharges; and,
- Storm Water Outflow.

As discussed in Section 5.3, operational noise levels associated with the existing WwTP facility were measured along the facility boundary (Location N1). The survey was undertaken during normal operation when the above activities were in operation. The contribution from operational activities were audible at low level at the site boundary. The measured noise levels are below those typically associated with an EPA licensed facility for day, evening and night-time periods.

Taking account of the ambient noise level measured at Location N1 (46 dB $L_{Aeq,T}$) and correcting for distance attenuation only, the noise contribution from the WwTP is less than 20 dB at the closest off-site NSLs. The operation of the facility is therefore well below the range of noise emission limits typically applied to a facility of this nature. In addition, the operation of the facility was inaudible at the monitoring locations offsite (N2, N3 and N4).

In terms of traffic accessing the site, there is ca. one load per week of sludge removal and one load of non-sludge waste per week and one employee per day. This equates to 1 to 2 vehicles per week accessing the site and one car per day entering and exiting the site. The closest NSLs to the site access road are at distance of 135m to the east. The contribution of 2 No. tankers per week along the site access road would not contribute any notable noise level at NSLs located 135m from the road. It is also noted traffic only enters and exits the site during daytime periods. As discussed in Section 5.3.5, road traffic along the surrounding road network, namely along the R634 N25 roads form the main background noise sources. The insignificant traffic volumes from the WwTP has no effect on noise levels along the surrounding roads.

There are no noise sources associated with the Dunn's Park discharge outfall.

The operation of the existing WwTP and Dunn's Park discharge outfall therefore is neutral, not significant and long term.

There is no change to the noise environment associated with the project (i.e. proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall), hence the effect of continued operation when compared to existing conditions is neutral, imperceptible and long term.

5.7. Cumulative Effects

5.7.1. Construction Phase

There is no construction phase associated with the project, hence the effect is neutral. In the event that construction works are occurring at other permitted or proposed developments in the area, any construction noise levels at NSLs will be specific to the project at hand and will not result in any cumulative noise effect with the project.

5.7.2. Operational Phase

The operational phase of the project is determined to be of neutral, imperceptible and long term noise effect. The baseline noise survey has measured the cumulative noise levels associated with the operation of the existing Youghal WwTP and Dunn's Park discharge outfall in addition to the surrounding noise sources which include road traffic, existing industrial and commercial activities and environmental noise sources including bird song, leaf rustle etc. As discussed in previous sections, there are no planned changes to the existing operations of the WwTP or Dunn's Park discharge outfall, hence no change in the existing noise environment will occur.

Table 13.1 in Section 13 includes all identified projects with potential for cumulative effects. These projects have been reviewed for noise and it is confirmed there are no cumulative noise effects with the project. The following project in the immediate vicinity that has been granted consent but has not yet been built have been reviewed and the potential for cumulative effects commented on.

Application	Description	Status	Distance from the project	Potential for cumulative effect
Ref: 204407 Power Capital Renewable Energy Limited	A 10 year planning consent for a 2.57ha extension to the solar PV farm permitted under Cork County Council planning consent reference number 17/05245 and will involve the incorporation of a 2.2 ha portion of the field to the north east of the permitted site on which approximately 5,016 additional photovoltaic panels	Granted	~300m to WwTP ~1.2km to Dunn's Park Discharge Outfall	Operation of WwTP and Dunn's Park Discharge Outfall inaudible at closest NSLs and operational noise level <20 dB at closest NSLs does not affect the background noise environment. Specific noise level from solar farm development at common NSLs will not result in any significant cumulative noise level.

5.8. Mitigation Measures

There are no required noise mitigation measures associated with either the construction or operational phases of the project.

5.9. Residual Effects

5.9.1. Construction Phase

There is no construction phase associated with the project. There are therefore no potential noise or vibration effects in this case as there is no construction taking place.

5.9.2. Operational Phase

The residual operational noise and vibration effect associated with the Operational Phase is determined to be neutral, imperceptible and long term.

5.10. Monitoring Requirements

Monitoring is not required for this project.

5.11. Difficulties Encountered During Preparation of This Chapter

No difficulties were encountered during the preparation of this chapter.

6. Land, Soils & Geology

6.1. Introduction

The land, soils and geology EIAR chapter has been completed by Julie Larkin, a Senior Environmental Consultant with Atkins and has 8 years' experience in environmental assessments and land contamination environmental risk assessments. Julie holds a bachelor's degree in Environmental Science and a Masters degree in Environmental Management and Protection. Julie is a chartered member of the Chartered Institute of Water and Environmental Manager.

This chapter describes the type of land, soils and geology likely to be encountered beneath and in the general area of the project. The project entails the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall location. Youghal WwTP is currently using the existing outfall as a temporary discharge location and there will be no demolition, construction or decommission phases associated with the project.

6.2. Study Assessment and Methodology

The following scope of work was undertaken by Atkins in order to complete the land, soils and geology assessment presented in this EIAR chapter;

- Desk-based study including review of available historical information.

This assessment has been completed in accordance with relevant best practice guidance from the Institute of Geologists of Ireland (IGI), '*Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements'* (IGI, 2013). The IGI guidance document is an updated version of the 2002 guidelines, '*Geology in Environmental Impact Statements, A Guide'* (IGI, 2002), which was revised to take account of legislative changes, and the operational experience developed by geoscientists in the production of relevant environmental assessments. This assessment has also been prepared in accordance with the relevant Environmental Protection Agency (EPA) guidance, '*Guidelines on the information to be contained in Environmental Impact Assessment Reports'* published in May 2022.

The desk-based study involved reviewing information from the following sources:

- GSI Datasets Public Viewer and Groundwater web-mapping (consulted May 2023);
- Ordnance Survey web-mapping to assess the surface topography and landforms (consulted May 2023);
- EPA Public Viewer and web mapping (consulted May 2023);
- Google Maps Aerial photography (consulted May 2023);
- Bing Maps Aerial photography (consulted May 2023); and,
- Cork County Development Plan 2022-2028 (CCC, 2022).

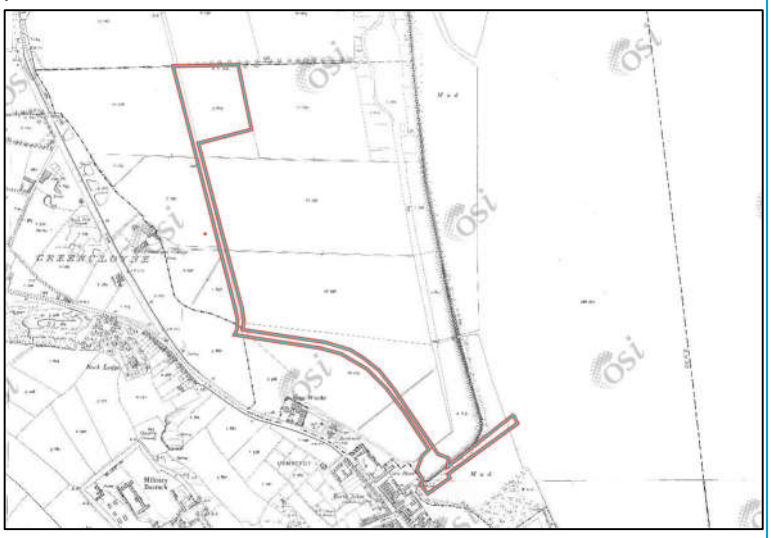
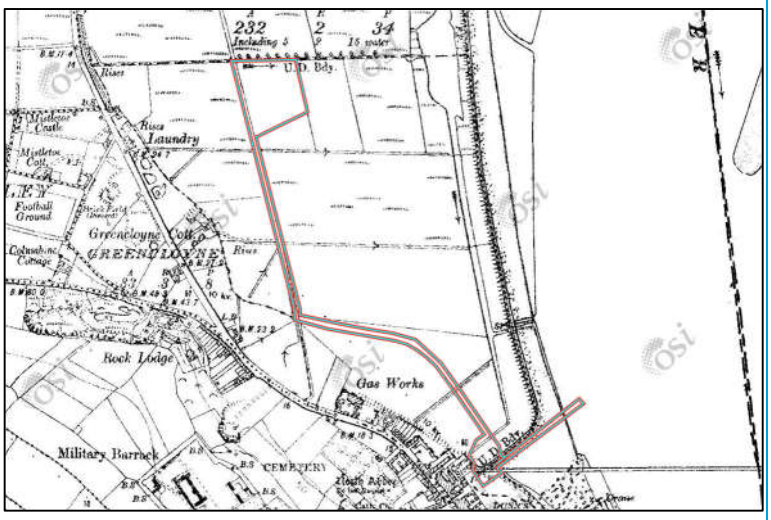
6.3. Receiving Environment

This section provides a description of the land, soils and geology in the general region of the project also takes account of the current and historic uses of the project (hereafter referred to as the Site).

6.3.1. Site Development

A review of the 6-inch historic maps (1829-41) confirms that land use has been primarily a vacant area of slob lands and the 25-inch historic maps (1897-1913) shows the area occupied by regular fields following the completion of the 19th century reclamation works. The Cassini 6-inch historic maps (1830-1930) and aerial photographs (1995 to 2012) from the Ordnance Survey of Ireland (OSI) (OSI, 2023) and current aerial photography (Bing Maps, 2023) confirms that land use has been primarily agricultural until the construction of the Youghal WwTP in 2017. A detailed summary of land use both in relation to the Site and surrounding lands is presented in Table 6.1.

Table 6.1 - Historic Maps of Site Development

		1837-1842 6 Inch BW (OSI, 2023) The Site and the surrounding area are located within a vacant area of slob lands with no structures shown in the boundary. The area where the site is located is called Youghal Mudlands.
7		1888-1913 Historic Map 25 Inch (OSI, 2023). The area the site is located is occupied by regular fields following the completion of the 19th century reclamation works.
		6 Inch Cassini Maps 1830-1930 (OSI, 2023) Within the surrounding areas, the town of Youghal has developed further to the south and west with a Gasworks, Abbey, Cemetery, Military Barracks and Corn Store to the south and Brickfield to the west.

Aerial Map 1995 (OSI, 2023).

There are a number of residential properties and commercial buildings to the west of the site on the 1995 aerial photography.

Aerial Map 1999 - 2003 (OSI, 2023).

There are further housing developments noted in the south and southwest.

Aerial Map 2005 - 2012 (OSI, 2023).

The former gasworks site is now the location of a supermarket and large carpark.

Aerial Map 2013 - 2018 (OSI, 2023).

There are no significant changes noted between the 2012 and the 2018 aerial photography.

Current Aerial Map (Bing, 2023)

There are no significant changes noted between the 2018 and the 2023 aerial photography. Youghal WwTP is constructed in 2017 and opened for use in 2018.

6.4. Current Site Setting and Topography

The site comprises the Youghal WwTP (operational from 2018), greenfield lands and the edge of Youghal estuary. The topography of the surrounding area generally falls from west to east, towards the Blackwater Estuary / Youghal Harbour. The topography of the site ranges between 0m and 5m above ordnance datum (mOD). In general, the surrounding areas do not exceed the 10mOD (with occasional localised depressions noted to have an elevation of ca. -4mOD) (OSI, 2023)[9]. The surrounding area comprises of residential properties and fields.

6.5. Ground Investigation

The soil deposits underlying the site and the Youghal Agglomeration area comprise soft thinly laminated organic silts and very silty clays with frequent thin sand layers and layers of partially decomposed organic material overlying dense gravel (Atkins McCarthy, 2001). Based on site specific data, these dense gravels were encountered at depths of 9.2m (BH1, located within the western portion of the Youghal WwTP footprint) and 14m (BH2, located within the eastern portion of the Youghal WwTP footprint) beneath the site, and the depth of this stratum increases towards the harbour. The gravel layer is saturated, with groundwater encountered within these deposits, rising to ground level during the site investigation (Atkins McCarthy, 2001). Refer to Figure 11.17 for the site specific geology showing depth of saturated gravels. No Ground Investigation was required for this project, as no demolition, construction or decommissioning will be required for the project.

[9] https://webapps.geohive.ie/mapviewer/index.html

6.6. Soils

Based on the Teagasc soils database available on the GSI public data viewer the site is underlain by two soil types. In the northern half the dominant soil type underlying the site and surrounding area is MarSands – marine derived gravels and sands, while the southern half comprises of made ground (GSI, 2023). Refer to Figure 6.1.

Figure 6.1 - Teagasc Soils (GSI, 2023)

According to the GSI public data viewer (GSI, 2023), the primary superficial / quaternary sediments underlying the vicinity of the Site include marine beach sands (Mbs) in the north and urban (made ground) in the south. Refer to Figure 6.2.

Figure 6.2 - Quaternary Sediments (GSI, 2023)

6.6.1. Soil Quality / Contaminated Land

On a regional scale there are currently 4no. EPA licenced facilities within the vicinity of the Site, as follows:

- Youghal Landfill at Youghal Mudlands, Youghal, Cork (W0068-03) is an Industrial Emissions (IE) licensed landfill facility located 427m north of the WwTP and ca. 1.5km north (and upstream) of Dunn's Park outfall pipe;
- ERAS ECO Ltd. at Foxhole, Youghal, Cork (W0211-02) is an IE licensed industrial facility, located 480m north of the WwTP and 1.40km south (and upstream) of Dunn's Park outfall pipe;
- Technicolour Home Entertainment Services Ireland Limited at Foxhole Industrial Estate, Youghal, Cork (P0151-02) is an Integrated Pollution Control (IPC) licensed facility, located 620m north of the WwTP and 1.6km south (and upstream) of Dunn's Park outfall pipe; and,
- Ashleigh Farms (Waterford) Limited is located in Waterford (P0651-01) is an IPC licensed facility, located 3.7km southeast of the WwTP and 3km southeast of Dunn's Park outfall pipe.

6.6.2. Bedrock Geology

The GSI bedrock geology 100k map identifies the underlying bedrock of the Site varies from north to south. The WwTP and surrounding utilities are underlain by Massive unbedded lime-mudstone of the Waulsortian Limestones formation. The wastewater pipeline running from the plant to the outfall, is underlain by Dark muddy limestone, shale of the Ballysteen formation and Massive & thick-bedded grey sandstone of the Crows Point formation. Dunn's Park discharge outfall is underlain by Massive & thick-bedded grey sandstone of the Crows Point formation as presented on Figure 6.3 below (GSI, 2023). There are no bedrock outcrops mapped within the Site. The structural geology mapping (GSI, 2023) shows two thrust faults (orientated north to south) on either side of the WwTP and Dunn's Park discharge outfall. There is 1no. karst feature, a 'spring' located within Youghal Agglomeration area. There is also a 'cave' lying ca.0.480km southwest of the Youghal Agglomeration boundary (GSI, 2023).

Figure 6.3 - Bedrock Geology at 100k (GSI, 2023)

6.6.3. Geological Heritage

There are no audited geological heritage sites within 500m of the site but there is 1no. unaudited heritage site situated ca. 1.7km south of Dunn's Park discharge outfall. The geological heritage area is named "Youghal (under lighthouse)" and has been assigned a County Geological Site (CGS) designation (GSI, 2023).The closest audited geological heritage site is Whiting Bay and Goat Island (WD055), located ca. 3.2km east of the site. This geological heritage site is described by the GSI (2023) as '*Coastal cliffs, beach and foreshore, displaying a variety of rocks and glacial sediments'.*

The project will not have any effect on the Youghal (under lighthouse) geological heritage area or the Whiting Bay and Goat Island, as there will be no demolition, construction or decommission phases associated with the project.

6.6.4. Geo-hazards

There are no landslide susceptibility issues or historic landslide events reported within the vicinity of the Site (GSI, 2023). Landslide susceptibility for the Site is '*low*' with '*low (inferred)*' landslide susceptibility. Refer to Figure 6.4 below.

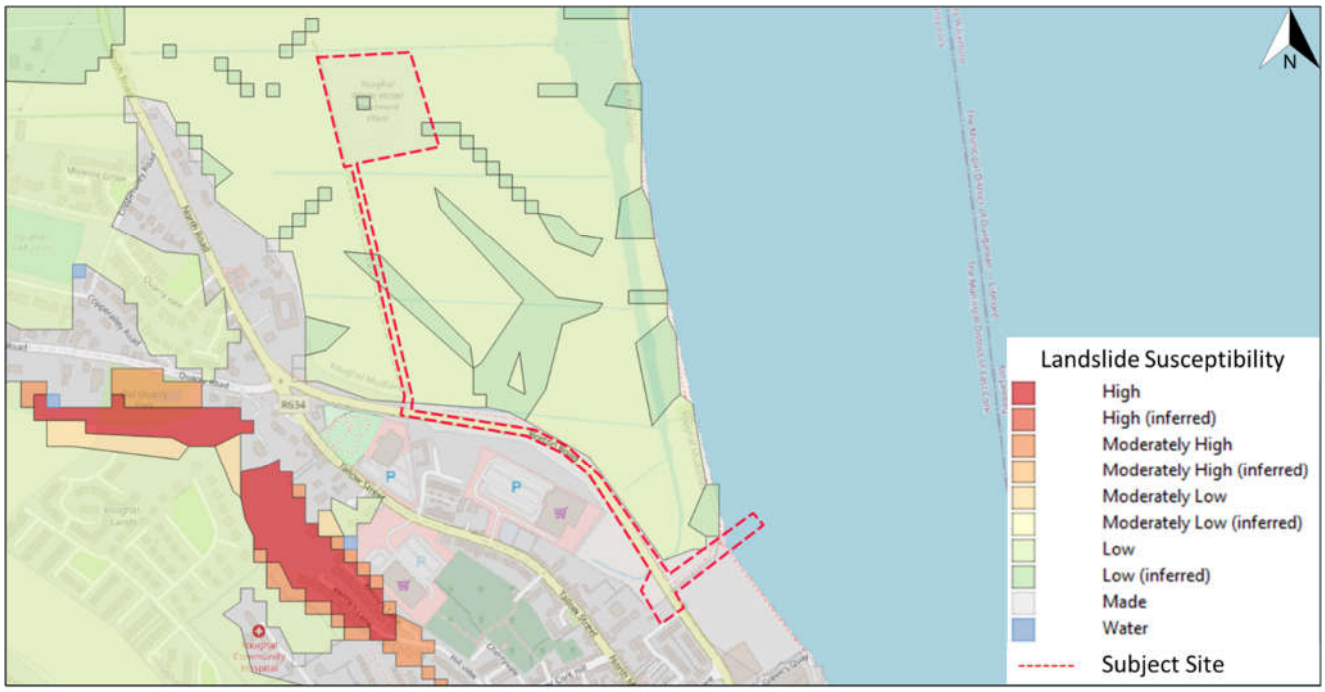


Figure 6.4 - Landslide susceptibility (GSI, 2023)

6.6.1. Radon

Available EPA radon maps shows that the WwTP is within a '*High*' radon area *and about 1 in 10 homes in this area is likely to have high radon levels'* Dunn's Park outfall is within an "*Other*" radon area '*about 1 in 5 homes in this area is likely to have high radon levels* (EPA, 2023). However, there will be no demolition, construction or decommission phases associated with the project. Therefore, radon will not have any impact on the project.

6.6.2. Land Use Zoning

The site is located ca. 1.3km north of the town centre, in an area called the Mudlands. The site is bounded to the north by mudlands and greenfields, to the east by mudlands and the Lower Blackwater Estuary and to the south and west by mudlands, greenfields and residential properties. The site is primarily zoned as '*YL-GC-06 (Green Conservation')* in the Cork County Development Plan 2022-2028, which states that:

'This area, consisting predominantly of woodland and agricultural land, forms an important visual part of the setting to Youghal particularly when seen from the north. The site forms part of a significant ecological green infrastructure corridor adjoining the estuary and supports wetland habitats including salt marshes, reed beds, marshes and lagoons. The existing pattern of land uses will remain largely unchanged. Parts of this area are important for overwintering wetland birds associated with the estuary. There may be opportunities for biodiversity enhancement of this area which should be encouraged' (Cork County Council (CCC), 2022).

A small section of the project site is zoned as '*Existing residential/mixed residential and other uses'*. Section 18.3.5 of the Plan states that '*These areas generally have a primary or strong residential component but which also provide for non-residential uses which protect and improve the primary use of these areas'* (CCC, 2022). Refer to Figure 6.5.

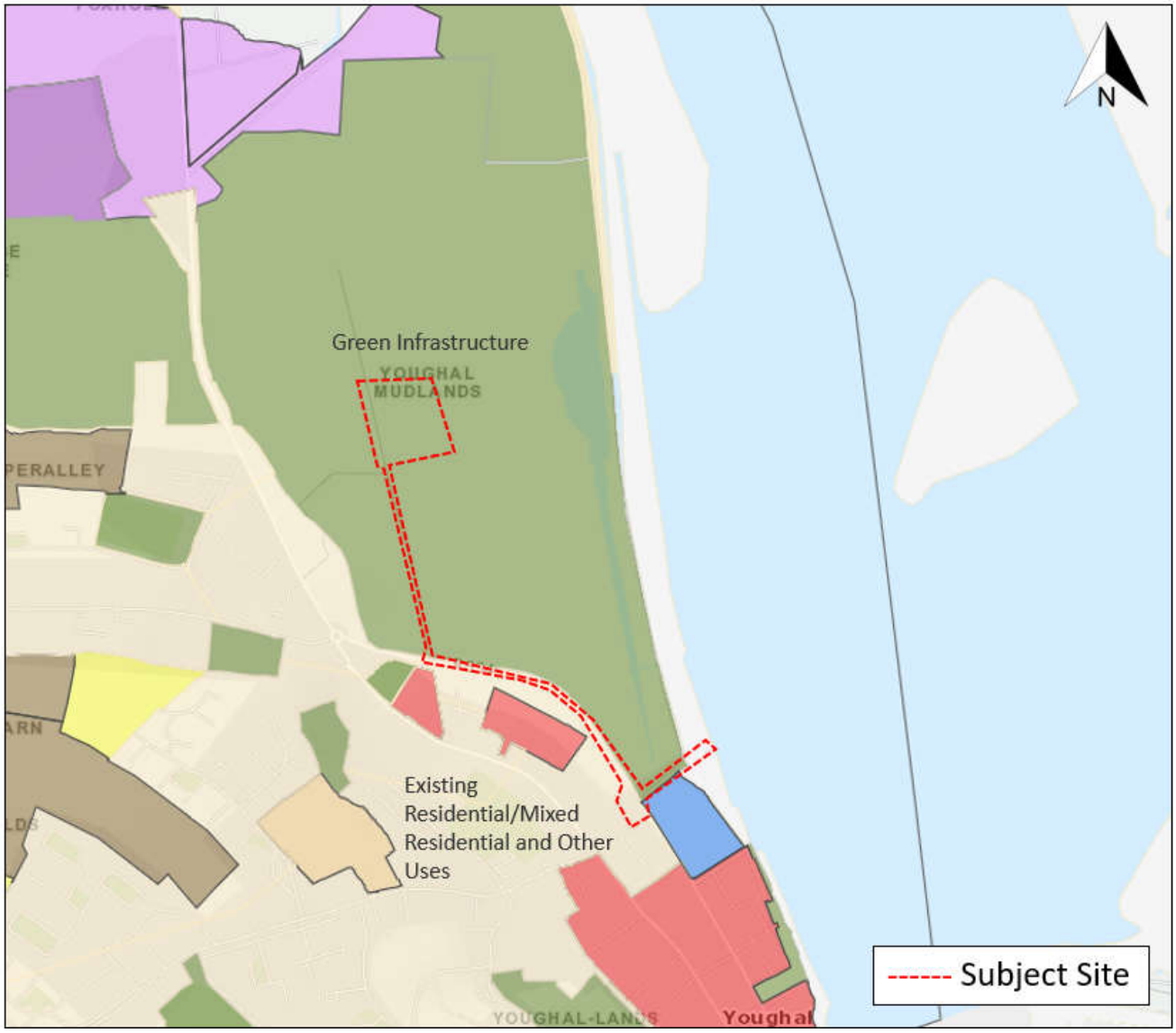


Figure 6.5 - Land Use Zone (CCC, 2022)

6.7. Potential Effects on Land, Soils & Geology during Construction Phase

Youghal WwTP is currently using the Dunn's Park discharge outfall as a temporary discharge location. There are no demolition, construction, or decommissioning phases as part of the project, hence there is no proposed works, no land take or ground excavation occurring. Therefore there are no associated effects.

6.8. Potential Effects on Land, Soils & Geology during Operational Phase

The project will have a neutral effect on land as no land take is required for the project. There will be no change in overall use of the WwTP lands. There is no evidence of soil contamination at the project. There will be no effects with regards to land (including land take), soils or geology during the operational phase, based on the nature, location and scale of the project.

The project is for the use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall. There will be no changes to the current operation phase or WwTP process of the WwTP hence there will be no changes to the discharge at Dunn's Park and therefore there will be no effects with regards to the land, soils and geology predicted. Hence effects are neutral, imperceptible and long-term.

6.9. Cumulative Effects

A review of all relevant projects (committed developments, consented projects, granted / approved developments, and projects applied for relevant consents, and licensed and permitted projects), as listed within Table 13.1 (Cumulative Impacts Assessment of Projects) of Chapter 13 has been undertaken. No significant cumulative effects are likely. The proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall will not act in combination with other project (listed in Table 13.1.) to result in any predicted cumulative effects on the land, soils and geology are predicted. Therefore no significant cumulative effects are likely.

6.10. Mitigation

There are no predicted effects on the land, soils and geology which will require mitigation measures. There are no required mitigation measures associated with operational phase of the project.

6.11. Residual Effects

Residual effects with regards to land (including land take), soils or geology will be neutral, imperceptible and long-term.

6.12. Do Nothing Scenario

The Site is located within Youghal. There would be no difference in the 'do nothing' scenario, i.e. the current baseline; discharge treated effluent from Dunn's Park as a temporary discharge outfall and Youghal WwTP will continue to operate in its current format and capacity. The project will not have any effect on land, soils and geology.

6.13. Monitoring

As the project will not require any mitigation measures for the land, soils and geology, no monitoring will be rquired.

6.14. Difficulties Encountered

No difficulties were encountered during the preparation of this chapter.

7. Traffic

7.1. Introduction

This EIAR chapter was prepared by Nicholas Van Den Berg, who has 9 years' experience as a traffic and transportation engineer. Nicholas has a bachelor's degree in engineering and is a member of the Institute Engineers Ireland.

The project is for the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall. There is no demolition, construction or decommission phases associated with the project. Youghal WwTP is currently using the Dunn's Park discharge outfall as a temporary discharge location.

7.2. Methodology

This Traffic Chapter and associated assessment has been carried out in accordance with European Union and National level policy. It has also been carried out in accordance with the following local level policy documents and best practice guidance documents listed below:

- Cork County Development Plan 2022 - 2028;
- Environmental Protection Agency – Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022);
- Transport Infrastructure Ireland - Traffic and Transport Assessment Guidelines 2014; and
- Transport Infrastructure Ireland - PAG Unit 5.3 Travel Demand Projections 2016. 8.4.

The following tasks were considered during the preparation of the Traffic Chapter:

- Assess surrounding road and transport infrastructure;

There is no demolition, construction or decommission phases associated with the project. There will be no change to the operation of the development. There will be no change to traffic associated with the development.

7.3. Receiving Environment

Access to the existing WwTP is provided off the R634. This access will be retained for the project. The cross-section and access point are shown in Plate 7.1 below. The section of R634 road between the access point to WwTP and the outfall pipe location is ca. 750 meters in length.

The current operation phase of the WwTP is as follows:

- Sludge Truck – 1 truck per week, which will attribute to 2 round trips per week; and,
- Employee Trips – 1 employee per day which will attribute to 2 trips per day.

Plate 7.1: Existing WwTP Access

7.4. Potential Traffic Effects on the Local Road Network during Construction Phase

As a result of there being no construction phase, no effects are expected on the local road network.

7.5. Potential Traffic Effects on the Local Road Network during Operational Phase

The WwTP current generates the following traffic volume during the operation phase:

- Sludge Truck – 1 truck per week, which will attribute to 2 round trips per week;
- Non-sludge Truck - 1 truck per week, which will attribute to 2 round trips per week; and,
- Employee Trips – 1 employee per day which will attribute to 2 trips per day.

Considering the worst case scenario where both sludge and non-sludge trucks and employee trips occur on the same day, the total number of trips per day would be 6 (3 trips in the AM peak and 3 trips in the PM peak). This implies that the current traffic generated by the project is insignificant and does not significantly contribute to congestion or adversely affect the local road network.

There will be no change to the existing situation so there will be a neutral, imperceptible and long-term effect on the local road network.

7.6. Cumulative Effects

The project will have a neutral, imperceptible effect on traffic. Based on the review conducted on the relevant projects listed (committed developments, consented projects, granted / approved developments, and projects applied for relevant consents, and licensed and permitted projects) within Table 13.1 (Cumulative Impacts Assessment of Projects) of Chapter 13, it has been observed that no significant cumulative effects are expected. The analysis suggests that the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall will not combine with other projects listed in Table 13.1 to result in any predicted cumulative effects on the local road network. As a result, it is concluded that no significant cumulative effects are likely to occur.

7.7. Mitigation Measures

No mitigation measures are required as the projects traffic impact on the local road network is expected to be imperceptible.

7.8. Residual Effects

Residual effects with regards to traffic will be neutral imperceptible and long-term.

7.9. Do Nothing Scenario

The Site is located within Youghal. There would be no difference in the 'do nothing' scenario, i.e. the current baseline; discharge treated effluent from Dunn's Park as a temporary discharge outfall and Youghal WwTP will continue to operate in its current format and capacity. The project will remain as is and will not have any effect on traffic. It is expected that the site will experience a neutral and imperceptible effect in terms of traffic-related impacts on the local road network under the Do-Nothing scenario.

7.10. Monitoring Requirements

Since the project does not require any mitigation measures for transport-related impacts, therefore, there is no requirements for monitoring such measures.

7.11. Difficulties Encountered

No difficulties were encountered during the preparation of this chapter.

8. Cultural Heritage

8.1. Introduction

This chapter was prepared by Tony Cummins of John Cronin and Associates. Mr Cummins holds primary and post-graduate degrees in archaeology (B.A. 1992 and M.A. 1994, University College Cork) and has 28 years' continuous experience as a consultant archaeologist, including extensive experience in the compilation of cultural heritage impact assessments.

The tangible elements of cultural heritage can be broadly divided into the archaeological resource comprising sites and monuments dating from prehistory to the post-medieval period and the architectural heritage resource, encompassing standing structures and sites of cultural importance often dating to the post-medieval and modern periods. In addition, assets such as local place names, historical associations, folklore and traditions form part of the intangible cultural heritage resource.

The project will entail the use of the temporary discharge outfall Dunn's Park (SW000) as a permanent discharge outfall. Youghal WwTP is currently using the existing outfall as a temporary discharge location and there will be no demolition, construction or decommissioning phases associated with the project.

The chapter describes the baseline cultural heritage environment within a study area that encompasses the project location and the lands extending for 50m from its boundary and then presents an assessment of effects and conclusions in relation to the need for any mitigation measures.

8.2. Methodology

8.2.1. Desktop Study

The desktop study was carried out to identify the recorded archaeological sites, designated architectural heritage structures and any other undesignated features or areas of cultural heritage significance within the environs of the project. The *Sites and Monuments Record* (SMR) and the *Record of Monuments and Places* (RMP) for County Cork, published by the Archaeological Survey of Ireland (ASI), were the principal sources consulted for identifying known archaeological sites. These records are published online on the National Monument Service's website. The Record of Protected Structures (RPS), as published in the Cork County Development Plan 2022-2028, and the National Inventory of Architectural Heritage (NIAH)[10], including its survey of historic gardens, were consulted to assess the designated architectural heritage resource.

The following presents an overview of other sources consulted as part of the desktop study:

- County Cork Development Plan 2022-2028;
- Department of Arts, Heritage and Gaeltacht 2011 Architectural Heritage Protection: Guidelines for Planning Authorities;
- Department of Arts, Heritage, Gaeltacht and the Islands 1999 Framework and Principles for the Protection of Archaeological Heritage.
- National Monuments Service Historic Environment Viewer[11];
- National Monuments Service Wreck Viewer[12];
- Archaeological Inventory of County Cork: Vol. 2 (East and South Cork);
- Heritage Council of Ireland: Heritage Map Viewer[13];
- Database of Irish Excavation Reports[14];
- Historical publications and cartographic sources;
- Aerial and Satellite Imagery;
- Placenames Database of Ireland[15]; and,

[10] https://www.buildingsofireland.ie/ (accessed 08/03/2023)
[11] https://maps.archaeology.ie/HistoricEnvironment/ (accessed 08/03/2023)
[12] https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=89e50518e5f4437abfa6284ff39fd640 (accessed 08/03/2023)
[13] https://www.heritagemaps.ie/WebApps/HeritageMaps/index.html (accessed 08/03/2023)
[14] https://excavations.ie/ (accessed 08/03/2023)
[15] www.logainm.ie (accessed 08/03/2023)

- Topographical Files of the National Museum of Ireland (inspected in August 2022).

8.2.2. Site Inspection

The location of the project was inspected in September 2022 and extracts from the compiled photographic record are presented in Section 8.3.

8.3. Receiving Environment

Overview of Receiving Environment

The project is located within the townland of Youghal Mudlands in the northern outskirts of Youghal town and at its nearest point is ca. 150m outside the medieval walled town. It is contained within a former area of slob lands which was reclaimed from the western side of the harbour during the middle of the 19th century and was then developed as an area of vacant agricultural grassland during subsequent decades. The Youghal WwTP and its associated infrastructure and are contained within the footprint of the 19th century reclamation area.

Recorded Archaeological Sites

There are no recorded archaeological sites located within the boundary of the project, which is also outside the Zone of Archaeological Potential around the historic core of Youghal town, as defined by the National Monuments Service of the Department of Housing, Local Government and Heritage (Figure 8.1). The nearest recorded archaeological site to the project is a 19th century gasworks (CO067-031----) within a property located 120m to the south of the section of the outfall route extending along the R634 road (Figure 8.1). The site of a Dominican Friary (CO067-030002-), which was built outside the north walls of the medieval town during the 13th century, is located ca. 180m to the west of the nearest section of the outfall route and this location also contains the former site of a church (CO067-061----) and an existing graveyard (CO067-030001-). A derelict country house located ca. 220m to the west of the project is also listed as an archaeological site (CO067-038----). In addition, a review of the National Monuments Service Wreck Viewer revealed that there are no recorded shipwrecks located within the environs of the Dunn's Park discharge outfall.

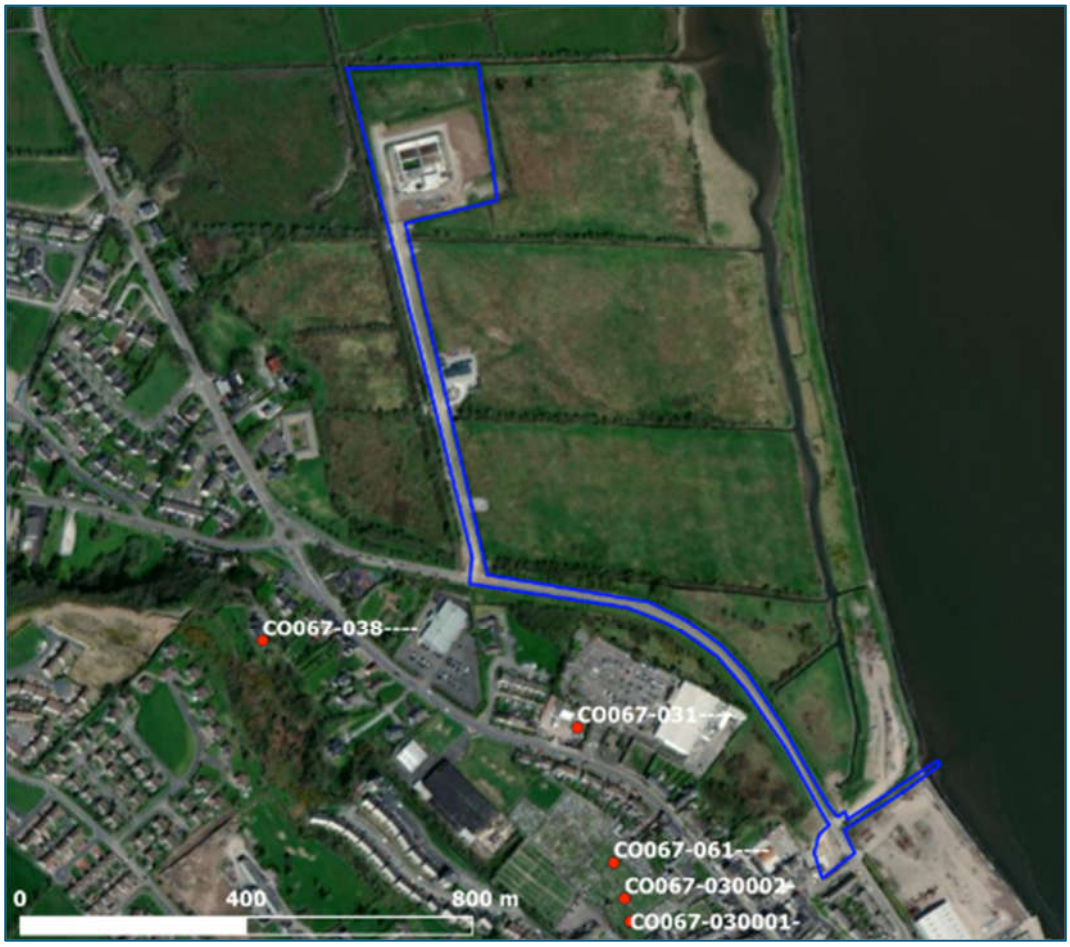


Figure 8.1 - Location of recorded archaeological sites within the environs of the project

Database of Irish Excavation Reports

A review of the Database of Irish Excavation Reports revealed that it contains no records of any archaeological investigations associated with the construction of the WwTP or discharge outfall. A 2006 programme of archaeological monitoring within a property in Foxhole townland in lands to the north of the project revealed nothing of archaeological significance[16]. A 2002 programme of archaeological test trenching within a reclaimed area to the south of the project revealed that the identified reclamation deposits in that area contained nothing of archaeological significance and overlay natural silts[17].

National Museum of Ireland Topographical Files

An inspection of the topographical file archive held in the museum premises in Kildare Street, Dublin was carried out in August 2022 revealed that it contains no entries describing the discovery of archaeological artefacts within the townland of Youghal Mudlands.

Architectural Heritage (including cartographic review)

The Record of Protected Structures (RPS) published in the *County Cork Development Plan 2022-2028* lists one example within the study area, and this comprises a waterfront limestone rubble wall, which was constructed in 1845 to bound the east side of the reclaimed slob lands (RPS ref. 2728) (Figure 8.2). This structure is also listed in the National Inventory of Architectural Heritage (NIAH ref. 20823004) which assigns it a regional ranking. There are no other structures listed in the RPS or NIAH within the study area although a number of examples are located within its environs and these comprise a late 18th century terrace house (RPS 2727), an early 19th century house (RPS 2726/NIAH 20823002), a post box (RPS 2726/NIAH 20823003), a bridewell (RPS 2729/NIAH 20823005) and a terrace of five houses (NIAH 20823011 to 20823015) (Figure 8.2). The project does not extend within curtilage lands associated with any of these architectural heritage constraints. The project is also located outside the Youghal Architectural Conservation Area as mapped in the current Development Plan. The detail on the first edition 6-inch OS map (published 1842) shows the project location as part of a vacant area of slob lands and no structures are shown within its boundary (Figure 8.3). The detail on the 25-edition OS map (published 1905) shows the area occupied by regular fields following the completion of the 19th century reclamation works (Figure 8.4). There are no buildings depicted within the project boundary on the 25-inch map although the south end of the outfall route in Dunn's Park extends within the environs of a southern turn of the reclamation boundary wall (RPS ref. 2728). The area of slob land to the south of this turn in the wall was reclaimed at some point during the 20th century which likely resulted in the sealing of this section.

[16] http://excavations.ie/report/2006/Cork/0015076/
[17] http://excavations.ie/report/2002/Cork/0007687/

Figure 8.2 - Location of designated architectural heritage structures within environs of the project

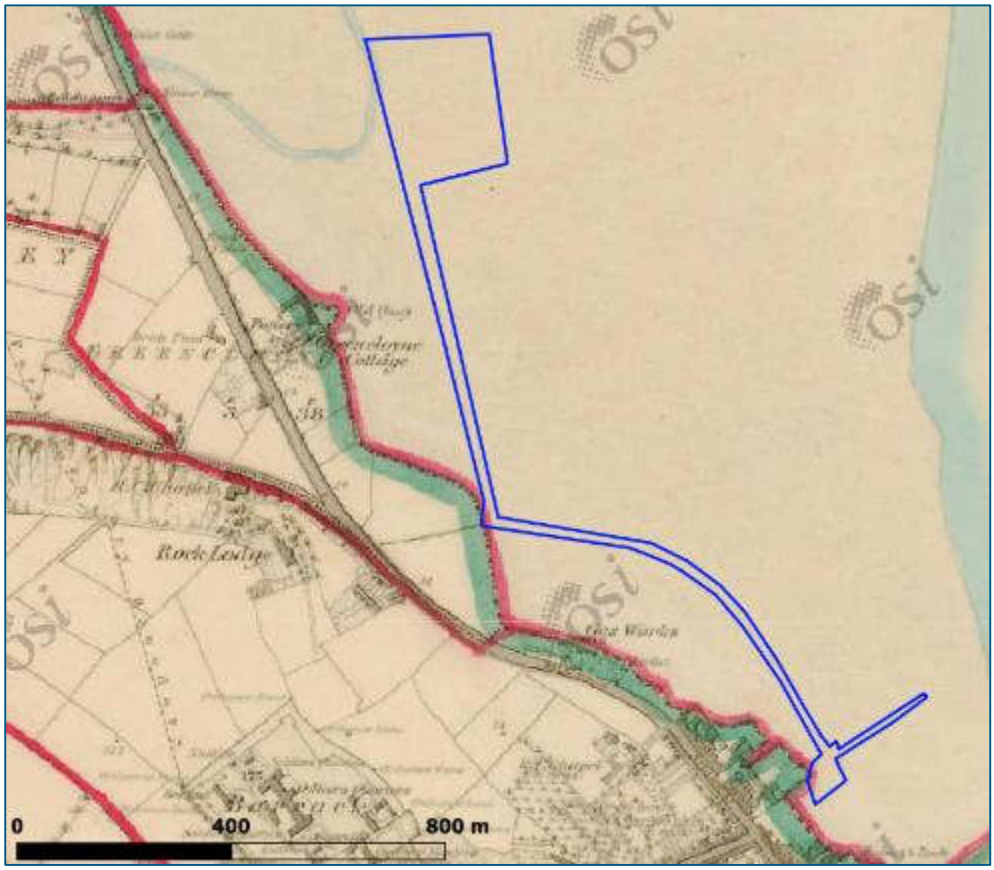


Figure 8.3 - Extract from 6-inch OS map showing location of the project location (OSI Licence 0003323)

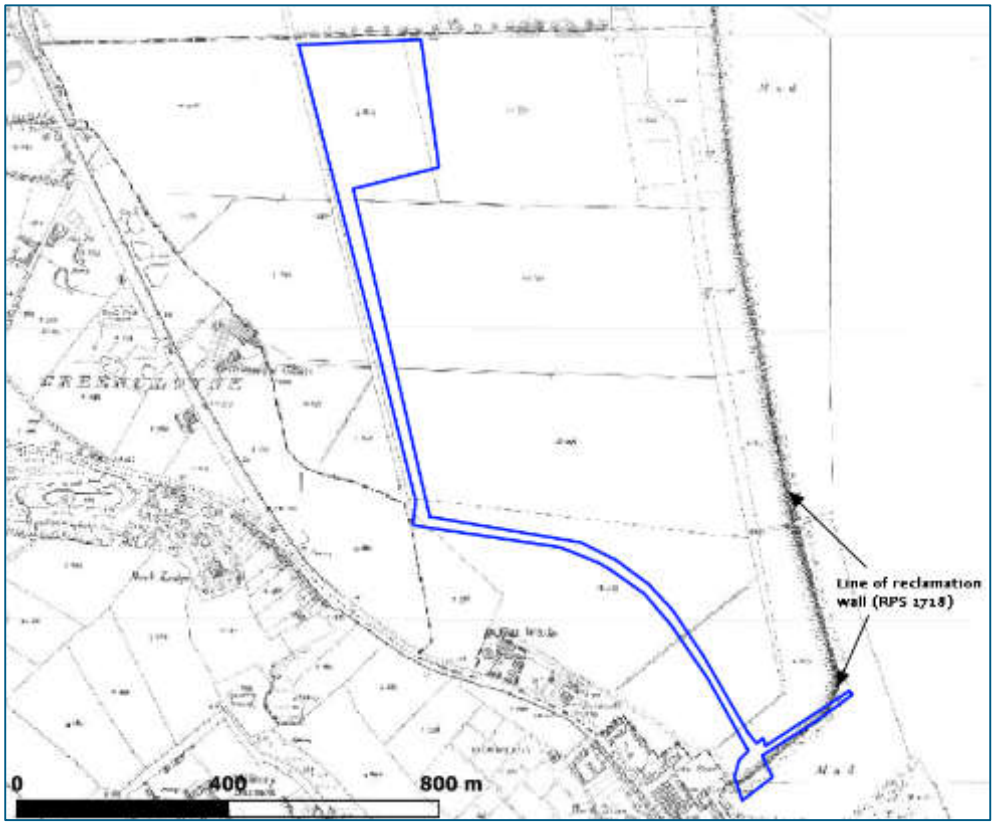


Figure 8.4 - Extract from 25-inch OS map showing project location (OSI Licence 0003323)

Undesignated Cultural Heritage Assets

There were no undesignated or previously unrecorded cultural heritage assets noted within the project boundary during the desktop study.

Site Inspection

An inspection of the project location was carried out in September 2022 in clear weather conditions and no access issues were encountered. The WwTP is accessed from a road extending northwards from the R634 and the existing built environment within the property dates to the recent construction of the facility. An inspection of the underground outfall route extending to Dunn's Park discharge outfall location within the waterfront to the southeast did not reveal any unrecorded features of cultural heritage significance along the R634 road or within the Dunn's Park discharge outfall area. The Dunn's Park discharge outfall extends under a modern concrete footpath which is adjacent to the south end of the section of walling bounding the reclamation lands (RPS ref. 2728). This reclamation wall structure remains extant and extends along the shoreline to the north of the outfall location (see Plate 8.4).

Plate 8.1 - View of existing infrastructure within WwTP

Plate 8.2 - View of outfall route along R634 road

Plate 8.3 - View of general area of outfall route within Dunn's Park

Plate 8.4 - View from south of general location of outfall with limestone walling (RPS 2728) visible extending to north

8.4. Do Nothing Scenario

The 'do nothing' scenario is continuation of the existing baseline, i.e. discharging treated effluent from Dunn's Park with the ongoing operation of the WwTP and would result in no likely effects on the cultural heritage resource.

8.5. Potential Effects on Cultural Heritage during Construction Phase

The project will not include a construction phase and will not require any ground excavation or demolition works. Therefore, there are no associated effects.

8.6. Potential Effects on Cultural Heritage during Operational Phase

The review of the cultural heritage resource within the study area, as described in Section 8.3, revealed that the project is located within an area reclaimed in the 19th century and is not located within the Youghal Zone of Archaeological Potential or Architectural Conservation Area. In addition, there are no recorded archaeological sites located within 120m of its boundary. A masonry boundary wall delimiting the east side of the reclamation lands, which is a Protected Structure (RPS 2728), is located to the north of the existing discharge outfall. The proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall will have a neutral, imperceptible, long-term effect on this boundary wall and on the other cultural heritage constraints located within the study area.

8.7. Cumulative Effects

A review of the projects (committed developments, consented projects, granted / approved developments, and projects applied for relevant consents, and licensed and permitted projects) listed in Table 13.1 of this EIAR was carried out as part of this assessment. It is concluded that the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge location outfall will not have the potential to act in combination with these developments to result in any likely cumulative effects on the cultural heritage resource.

8.8. Mitigation Measures

The proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge location outfall will have a neutral, imperceptible, long-term effect on the cultural heritage resource and, therefore, no mitigation measures for this resource are required.

8.9. Residual Effects

The project will result in a neutral, imperceptible, long-term effect on the cultural heritage resource.

8.10. Monitoring Requirements

As the project will not require any mitigation measures for the cultural heritage resource, no mitigation monitoring requirements are, therefore, required.

8.11. Difficulties encountered during preparation chapter

No difficulties were encountered during the preparation of this assessment.

9. Population and Human Health

9.1. Introduction

The population and human health EIAR chapter has been co-authored by Avril McCollom and Julie Larkin.

Avril McCollom is an Environmental Consultant with Atkins and has 5 years' experience in environmental assessments. Avril holds bachelor's degree in Freshwater and Marine Biology and is an associated member of Institute of Environmental Management & Assessment. Avril has completed Population and Human Health assessments for EIARs and environmental reports.

Julie Larkin is a Senior Environmental Consultant with Atkins and has 8 years' experience in environmental assessments. Julie holds a bachelor's degree in Environmental Science and a Masters degree in Environmental Management and Protection. Julie is a chartered member of the Chartered Institute of Water and Environmental Manager. Julie has completed Population and Human Health assessments for EIARs and environmental reports.

This chapter assesses the likely significant effects of the project on the Population and Human Health setting in the general area of Dunn's Park discharge outfall at Youghal WwTP in Co. Cork. It follows the requirements and methodology set out in section 9.2 and 9.3. This chapter summarises the regulatory and policy framework related to Population and Human Health, details the methodology followed for the assessment and describes the existing environment in the area surrounding the project.

This chapter considers demographics, economic activity, tourism and recreation, community and amenities and human health.

9.2. Legislation, Policy, Guidance

This chapter provides an assessment of the potential effects of the project (also referred to as 'the Site') on the broader human environment under two considerations:

- Population and Associated Factors; and,
- Human Health

The following legislation, policy and guidance are relevant to this chapter and were considered during the assessment process:

- Guidelines on the information to be contained in Environmental Impact Assessment Reports, Environmental Protection Agency (EPA), 2022 highlights the amendments to Article 3(1) of amended European Union (EU) Environmental Impact Assessment (EIA) Directive 2011/92/EU as amended by Directive 2014/52/EU (the "EIA Directive") which states that:

  "The environmental impact assessment shall identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of a project on the following factors: a) population and human health; […]"

- The Guidelines on the information to be contained in Environmental Impact Assessment Reports, hereafter referred to as the EPA Guidelines 2022 state that: *'in an EIAR, the assessment of impacts on population and human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in this EIAR e.g. under the environmental factors of air, water, soil etc'*

- Moreover, Annex IV, paragraph 5(d) of the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018) requires an EIAR to contain:

  "A description of the likely significant effects of the project on the environment resulting from, inter alia, "the risks to human health"

  When outlining the scope of environmental factors covered by the EIA Directive within Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission, 2017), "population and human health" is defined as follows:

  "*Human health is 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 pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation, and decommissioning of a Project in relation to workers on the Project and surrounding population."*

- Planning and Development Regulations 2001-2023;
- Planning and Development Act, 2000, as amended 2017 (S.I. No. 20 of 2017), 2018 (S.I. No. 16 of 2018), 2020 (S.I. No. 92 of 2020), 2021 (S.I. No. 18 of 2021) and 2022 (S.I. No. 75 of 2022);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018);

The following publications and data sources were consulted in the preparation of this Chapter:

- Central Statistics Office (CSO) data website (2011, 2016 data and 2022 preliminary results) (www.cso.ie);
- Cork County Development Plan 2022 - 2028;
- Department of Health (2013) Healthy Ireland - A Framework for improved health and wellbeing 2013 -2015;
- Economic and Social Research Institute (ESRI) Quarterly Economic Commentary Winter 2022;
- Google Earth;
- Google Map;
- Health Service Executive data website www.hse.ie;
- Planning Applications Online Search at: http://planning.corkcoco.ie/ePlan/SearchTypes;
- Southern Regional Assembly Regional Spatial and Economic Strategy;
- World Health Organisation Online Search: https://www.who.int/data/gho/data/major-themes/health-and-well-being
- Department of Health (2013) Healthy Ireland - A Framework for Improved Health and Wellbeing 2013 -2015

All data sources were consulted the week ending 31st May 2023 except where otherwise stated.

9.3 Assessment Methodology

Department of Health (2013) Healthy Ireland - A Framework for Improved Health and Wellbeing 2013 -2015 defines health and wellbeing as follows:

> Health *'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. Health is much more than an absence of disease or disability, and individual health, and that of the country, affects the quality of everyone's lived experience. Health is an essential resource for everyday life, a public good, and an asset for health and human development'.*
>
> Wellbeing '*is an integral part of this definition of health. It reflects the quality of life and the various factors which can influence it over the course of a person's life. Wellbeing also reflects the concept of positive mental health, in which a person can realise his or her own abilities, cope with the normal stresses of life, work productively and fruitfully, and be able to make a contribution to his or her community. Consideration of health and wellbeing requires a shift in focus from what can go wrong in people's lives, to focusing on what makes their lives go well'.*

The World Health Organisation defines health as '*a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition'.*

There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. Therefore there are no associated effects.

For the purpose of this chapter, the assessment of the receiving environment has been conducted with regard to the location of the site and has been assessed on a national, regional and local level.

This Population and Human Health Assessment has been undertaken in accordance with relevant EPA Guidance (*Guidelines on the Information to be contained in Environmental Impact Assessment Reports* (2022) and EU Commission Guidance, as follows:

- Assessment of baseline, including identification and assessment of receiving environment of receiving environment and relevant receptors;
- Identification of environmental design and mitigation measures included in the construction methodology;
- Identification of the potential effects, and assessment of the magnitude of potential effects, and their significance;
- Consideration of mitigation measures; and,

- Assessment of residual effects.

Where relevant, assessment findings have been incorporated from the following chapters:

- Air Quality, Odour and Climate (Chapter 4);
- Noise and Vibration (Chapter 5);
- Soils, Geology and Land (Chapter 6);
- Water (Chapter 11); and,
- AECOM Marine Modelling Reports (2020, 2023). Refer to Appendix 11.1. and 11.2 (Refer to Appendix 11.1 to 11.6 for AECOM reports).

For the purposes of this report human health has been assessed using the following approach;

- Preparation of a Human Health Risk assessment via. Source-Pathway-Receptor (S-P-R) model.

A preliminary assessment of direct and indirect impacts on health which could potentially arise due to the construction and operation of the project, and also unplanned events, has been evaluated using a simple Source-Pathway-Receptor (S-P-R) model. This approach involves the identification of contaminant sources, environmental pathways and receptors, and the identification of any valid direct / indirect potential pollutant linkages. This risk-based approach is advocated by the EPA in relation to human health impact assessment. Risk assessment is defined by the EPA (2022) as follows;

> *'An analytical study of the probabilities and magnitude of harm to human health and the environment associated with a biological, physical or chemical agent, activity or occurrence.'*

9.4 Receiving Environment

The project is located in Youghal within the Mudlands. An assessment of the receiving environment is necessary to predict the likely significance of the effects of the project. A description of the relevant aspects of the current state of the environment (baseline scenario) in relation to population and human health is provided below via a desk-based study. In line with guidance provided by the EPA and the Department, the assessment of effects on population and human health refers to those environmental topics under which human health effects might occur e.g. water, air quality etc., but is not duplicated throughout this section.

The existing environment is considered in this section under the following headings:

- Land use and Settlement Pattern;
- Demographics Profile;
- Age Profile;
- Economic Profile;
- Tourism and Amenities;
- Bathing Water and Aquaculture; and,
- Human Health.

9.4.1 Land Use and Settlement Pattern

The site is located ca. 1.3km north of the town centre, in an area called the Mudlands. The site is bounded to the north by mudlands and greenfields, to the east by mudlands and the Lower Blackwater Estuary and to the south and west by mudlands, greenfields and residential properties. The site is primarily zoned as '*YL-GC-06 (Green Conservation')* in the Cork County Development Plan 2022-2028. A small section of the project site is zoned as '*Existing residential/mixed residential and other uses'* (CCC, 2022).

The nearest residential area is located 170m west to southwest of the site. The following features are also located within 0.5km of the site:

- Egans Funeral Directors – 300m northwest of site;
- Foxhole Industrial Estate – 470m directly north of site; and,
- Youghal Landfill – 427m north of site.

9.4.2 Demographic Profile

Demographic data published by the Central Statistics Office (CSO) identifies the nature of the population in the vicinity of the project that could be impacted during the operational phase. The most recent Census of Population

was conducted in April 2022, with previous data dating from 2016. Preliminary data has been published in relation to overall population, for 2022. At the time of the preparation of this report, a limited quantity of relevant data from the 2022 Census has been published, pertaining chiefly to overall population and housing in counties and Electoral Districts (EDs). Preliminary data indicates that the national population increased by ca. 11% since 2016 to 5,123,536. The main results from Census 2022 will be published over several months starting in April 2023 hence reference is made to Census 2016 in this assessment. The 2022 data has been utilised where available. Demographic trends are analysed at national, regional, and local levels for the purposes of the EIAR.

For the purposes of examining census population data, those ED wholly or partially included within the study area, and those which border the study area were examined. In this regard the Site falls within the Youghal Rural (Cork) ED (CSO Area Code: 18325) and borders the Youghal Urban (Cork) ED (CSO Area Code: 18010).

Given the nature of the project it is considered the key study areas are the 'Local Area' (comprised of Youghal Rural (Cork) and Youghal Urban (Cork) EDs and the County Area (consisting of Cork County Council). Population growth within the state, County Cork, Youghal Rural (Cork) and Youghal Urban (Cork) EDs are shown in Table 9.1.

Table 9.1 - Population Growth 2011 - 2022

Area	2011	2016	2022	Change 2011 - 2022
State	4,581,269	4,761,865,	5,123,536	+11%
Cork	399,216	417,211	584,156	+46%
Youghal Rural (Cork)	5,303	1,264	1,373	-74%
Youghal Urban (Cork)	6,900	7,075	7,653	+11%

Source: cso.ie

There has been a consistently high level of population growth within the state and County Cork over this period, with this growth anticipated to continue in the future. There has also been significant population growth between 2011 and 2016 in Youghal Urban (Cork) with a growth of 11%, and a significant decrease (-74%) in population growth in the Youghal Rural (Cork) between 2011 and 2016.

9.4.3 Age Profile

In comparison to other countries within the EU, Ireland has a relatively young population with only 13.4% of the population being 65 + in 2016, a 1.7% increase since 2011. The age profile of the population of the state, and Cork for 2011 and 2016 is highlighted in Table 9.2.

Table 9.2 - Population Structure by Age

Area / Age	0-14 (%)	15-24 (%)	25-44 (%)	45-64 (%)	65+ (%)
State 2011	21.3	12.6	31.6	22.7	11.7
State 2016	21.1	12.1	29.5	23.8	13.4
Change	-0.2	-0.5	-2.1	1.1	1.7
Cork 2011	23.0	11.4	31.3	23.2	11.1
Cork 2016	22.9	11.2	28.4	24.6	13.0
Change	-6.9	0.2	2.9	-1.4	-1.9

Source: cso.ie

9.4.4 Economic Profile

The 2016 Census of Population was examined to determine trends in relation to employment including the number of persons at work, unemployment levels and the sectoral composition of the population, based upon principal economic status.

Table 9.3 shows the overall unemployment rate as measured by the responses from the 2011 and 2016 Census. The unemployment rate is calculated by adding the number of persons unemployed to first time job seekers, and then dividing the total by the overall labour force (i.e. total amount of unemployed persons and employed persons).

Table 9-3 - Principal Economic Status 2011-2016

	State 2011	State 2016	Cork 2011	Cork 2016
At work	1,807,360	2,006,641	164,441	179,890
Looking for First Regular Job	34,166	31,434	2,006	1,827
Unemployed or given up on Previous Job	390,677	265,962	26,597	16,460
Unemployment Rate (%)	19.0%	12.0%	11.7%	8.8%

Source: cso.ie

It can be seen that the unemployment rate across the state and County Cork has decreased significantly between 2011 and 2016.

More recent data on employment is provided in the CSO Labour Force Survey published quarterly. This shows that in Q3 2022 the national unemployment rate was 4.2%, which is a significant drop since 2016.

9.4.5 Tourism and Amenities

Tourism and amenities (Social Infrastructure) includes a wide range of services and facilities including health, education, community, cultural, play, faith, recreation, and sports facilities that contribute to the quality of life. The project is located to the east of Youghal Town which is served by a wide range of community facilities typical of a town including shops, schools, sports clubs, gyms, number of primary and secondary schools and childcare facilities and public open spaces.

9.4.6 Bathing Water and Aquaculture

There are 3no. beaches which are designated bathing waters downgradient of Dunn's Park outfall. All 3no. beaches have an excellent water quality (latest year 2022) (EPA, 2023) as follows:

- Youghal Front Stand Beach (BWID: IESWBWC020_0000_0300) which is located ca. 2.30km south of Dunn's Park discharge outfall;
- Youghal Claycastle (BWID: IESWBWC020_0000_0200) which is located ca. 2.90km south of Dunn's Park discharge outfall; and,
- Youghal Redbarn (BWID: IESWBWC020_0000_0100) which is located ca. 4.20km south of Dunn's Park discharge outfall (EPA, 2023).

Refer to Figure 9.1 for the location of the beaches / bathing water areas (obtained from AECOM (2023) Marine Modelling Study). There are aquaculture license areas within the vicinity of the project, as per AECOM (2023) Youghal Wastewater Treatment Works Marine Modelling Study Addendum. Refer to Figure 9.1 and Appendix 11.1 (Refer to Appendix 11.1 to 11.6 for AECOM reports).

There is a Water Framework Designated Shellfish Water, Ballymacoda Bay (EPA Code: IE_SW_020_0000) located 7.00km south of Dunn's Park discharge outfall (EPA, 2023).

There is a Sea-Fisheries Protection Authority classified production area located ca. 2.10km south of Dunn's Park discharge outfall. Refer to Figure 9.1, which is obtained from the AECOM (2023) Youghal Wastewater Treatment Works Marine Modelling Study Addendum.

Refer to Appendix 11.1 AECOM (2023) Youghal Wastewater Treatment Works Marine Modelling Study Addendum and Appendix 11.2 AECOM (2020) Youghal Marine Modelling Study Modelling Report.

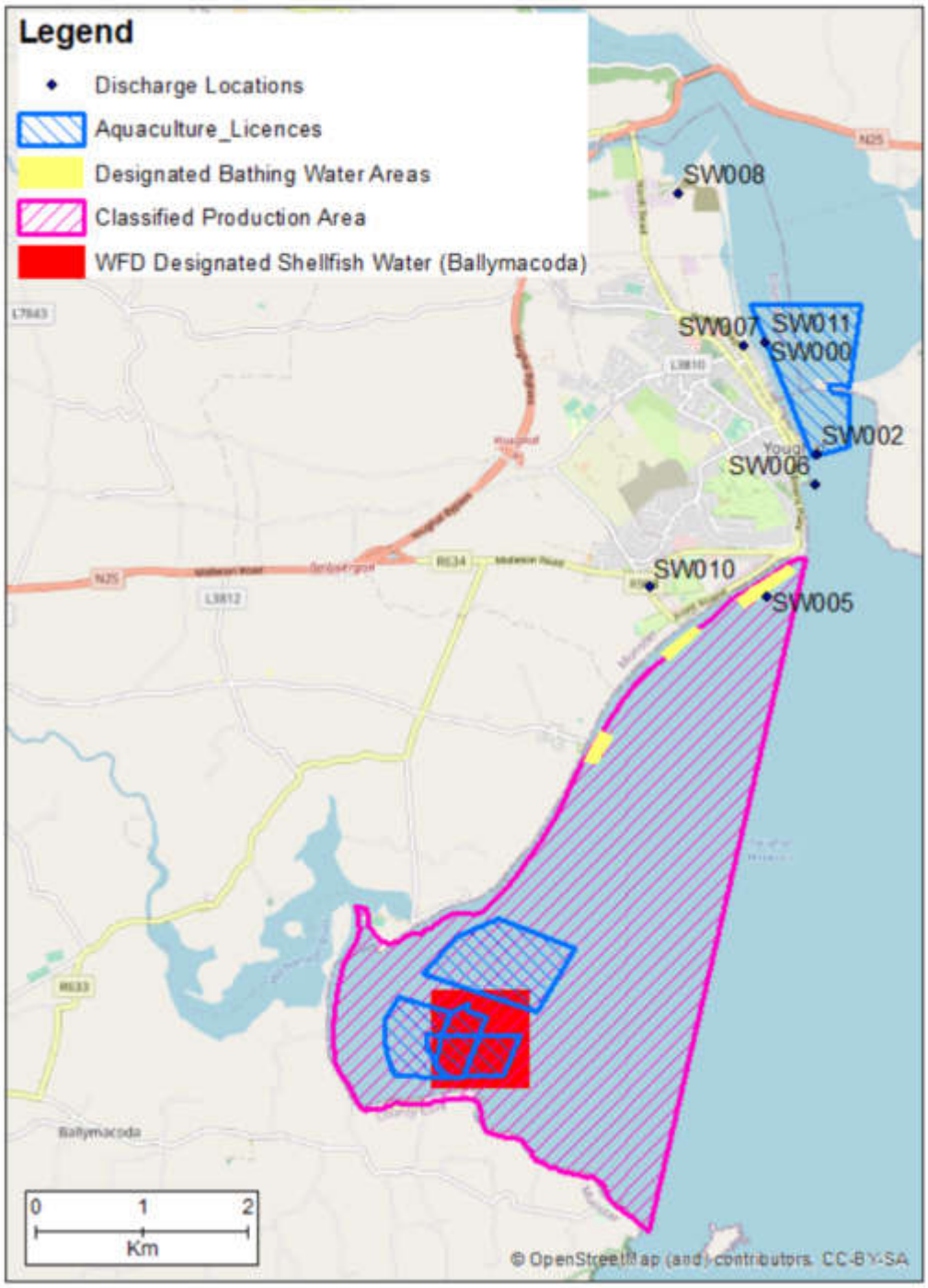


Figure 9.1 - Locations of the Youghal WwTP Dunn's Park Discharge (SW000) and sensitive receptors (Source: AECOM (2023))

9.4.7 Human Health

Overall life expectancy and self-assessed health statistics are included below.

The Department of Health's report 'Health in Ireland Key Trends 2022' provides statistical analysis on health in Ireland over the last ten years. Chapters 1 and 2 of the report deal specifically with life expectancy and health. According to this report the average life expectancy trends are as follows:

- Life expectancy for women (continual upward trend since 1996): 84.7 years; and,
- Life expectancy for men (continual trend since 2006): 81 years

It is also noted in the report that the gap between male and female life expectancy has continued to narrow over the last decade. An upward trend is evident in the life expectancy of older age groups reflecting decreasing

mortality rates from major diseases. Older Irish people's life expectancy (65 years of age) to be lived in good health, is higher for both men and women compared with the EU average.

The report also states that *"Ireland has the highest self-perceived status in the EU, with 82.1% of people rating their health as good or very good*". Overall population health at the national level shows decreasing mortality and a rise in life expectancy over the last ten years. The health in Ireland report also goes on to state, "*age-standardised mortality rates have declined for all causes over the past decade by 15.8%."*

According to the most recently published data from the CSO[18], the results of the Census in 2016 reported that the vast majority of people in County Cork (89.5%) reported that their health was good and very good.

9.5 Likely Significant Effect on Population and Human Health during the Construction Phase

There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. Therefore there are no associated effects.

9.6 Likely Significant Effects on Population and Human Health during the Operation Phase

9.6.1 Land use and Settlement Pattern

The existing WwTP is an established use, as is the existing Dunn's Park temporary discharge outfall.

The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. The effect is neutral, imperceptible, and long term on land use.

9.6.2 Demographics and Age Profiles

The project is within the Youghal Rural EDs which has decreased significantly in population growth since 2011. Dunn's Park discharge outfall has capacity to meet the maximum design discharge of 16,000 P.E. The collected load in 2021 was 11,338 P.E. as per UÉ 2021 Annual Environmental Report. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WwTP. There are no changes to existing operational plant items, buildings, or operational hours within the existing WwTP. The effect is neutral, imperceptible, and long term on demographics and age profile.

9.6.3 Economic Profile

The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. The effect is neutral, imperceptible, and long term on economic profile.

9.6.4 Tourism and Amenities

The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WwTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. The effect is neutral, imperceptible, and long term on tourism and amenities.

9.6.5 Bathing Water and Aquaculture

There will be no changes to the current operation phase, existing operational plant items or process of the WwTP hence there will be no changes to the discharge at Dunn's Park discharge outfall.

The potential likely significant operational effects on human health were assessed from different environmental assessment, as follows:

- AECOM marine modelling studies: AECOM (2023) Youghal Wastewater Treatment Works Marine Modelling Study Addendum (Refer to Appendix 11.1) and AECOM (2020) Youghal Marine Modelling Study Modelling Report (Refer to Appendix 11.2).

AECOM completed marine modelling studies for the project; AECOM (2020) Youghal Marine Modelling Study Modelling Report and AECOM (2023) Youghal Wastewater Treatment Works Marine Modelling Study Addendum. AECOM (2023) completed a Marine Modelling study for the project to assessment the treated

[18] General Health - CSO - Central Statistics Office

wastewater discharge from the Youghal WwTP to the Lower Blackwater Estuary / Youghal Harbour. This study was an assessment of the Youghal WwTP discharge to the Blackwater Estuary and the key receptors. The sensitive receptors included within the study were designated bathing waters, designated shellfisheries, classified production areas and designated aquaculture sites.

AECOM (2023) study showed that *'the assessment against the Bathing Water Directive shows that all the designated bathing waters are of Indicative Quality 'Excellent' for both Escherichia coli (EC) and Intestinal Enterococci (IE). The assessment against the criteria agreed with the EPA shows that the designated shellfish waters, classified production areas and aquaculture sites all meet both the target of 97th percentile <1500 cfu/100ml and geomean < 110 cfu/100ml for all receptors.'*

AECOM completed a Unit Impact Assessment (UIA) and a Flow Weighted Mass Balance calculation. The UIA has confirmed the findings of the deterministic modelling in that the proposed licenced loads result in:

- *The count of EC and IE bacteria at the designated bathing beaches (95th percentile for the summer) is such that the indicative quality is Excellent.*
- *The count of EC bacteria in the designated shellfish waters, classified production areas and aquaculture sites (annual 97th percentile and geomean) are such that all areas Meet the Targets agreed with the EPA.*
- *The source apportionment plots for all sampling locations demonstrate that the discharge from the Youghal WwTP and SWOs are not significant contributors to the total concentration for the 5% of the time that the 95th percentile is exceeded.*
- *The Youghal WwTP and associated SWOs account for less than 3% of the ammonia, Biochemical Oxygen Demand (BOD), ortho-P and Dissolved Inorganic Nitrogen (DIN) discharged to the estuary each year'* (AECOM, 2023).

'Based on the findings above it is concluded that the Youghal WwTP, operating at the design capacity of 16 000PE and discharging through the Dunn's Park outfall, will not adversely impact.

- *The current WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies.*
- *The bathing water quality at the beaches (Youghal Front Strand and Claycastle).*
- *The water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay'* (AECOM, 2023).

Taking the UIA approach, AECOM (2023) have confirmed the following:

- **Impact on Bathing Waters**
  - '*The assessments show that all bathing waters (and types of shellfish and aquaculture areas) achieve an indicative quality of "Excellent" bathing water status for both EC and IE. This is in line with the sampling reported on www.Beaches.ie for the past four years (2019 to 2022) at each of the beaches*.'
- **Impact on Shellfish Waters**
  - '*The assessment against the criteria agreed with the EPA shows that the designated shellfish waters, classified production areas and aquaculture sites all meet both the target of 97th percentile < 110cfu/100ml for all receptors and geomean < 110cfu/100ml for all receptors.'*
  - '*The results show that for Future loads (section 2.2) all receptors "meet the target" for both criteria and therefore all receptors "meet the targets" for the overall assessment which requires both targets to be met'.*
- **Source Apportionment**
  - '*For the purposes of source apportionment, extraction points have been established for all sensitive receptors. Extraction points labelled -4 to +4 are along the western edge of the Youghal Harbour aquaculture area approximately 50m apart, and extraction point 0 is 60m from the Dunn's Park outfall location'.*
  - *'The UIA demonstrates that none of the extraction points have a concentration that is higher than the assessment thresholds for the bathing water or shellfish water assessments, and therefore the discharges from Youghal Wastewater works and SWOs (and EOs) are compatible with the achievement of the water framework directive'.*

9.6.6 Human Health

There will be no changes to the current operation phase, existing operational plant items or process of the WwTP hence there will be no changes to the discharge at Dunn's Park discharge outfall. The operational stage of the project is unlikely to result in any significant effects in terms of human health. The potential likely significant operational effects on human health were assessed from different environmental perspectives, as follows:

- Chapter 4 – Air Quality, Odour and Climate;
- Chapter 5 – Noise and Vibration;
- Chapter 6 – Soils, Geology and Land;
- Chapter 11 – Water; and,
- AECOM (2023) Youghal Wastewater Treatment Works Marine Modelling Study Addendum (Refer to Appendix 11.1)

Chapter 4 (Air Quality, Odour and Climate) assessed the potential likely significant operational effects on human health. '*Air Quality Standards (AQS) are set to protect vulnerable people, such as those with respiratory illnesses, the elderly and infirm. Hence, the human health impact assessment has relied on compliance with the AQS to determine whether significant effects will arise on human health or not. There will be no significant emissions to atmosphere during the Operation Phase and the impact of the project has been assessed as neutral imperceptible and long term. Therefore, the potential human health effect during operation is imperceptible'* Therefore there will no likely significant human health effects. Refer to Section 4.10.

Chapter 5 (Noise and Vibration) assessed the operational noise levels associated with the existing WwTP facility. *'The operation of the facility is therefore well below the range of noise emission limits typically applied to a facility of this nature. In addition, the operation of the facility was inaudible at the monitoring locations offsite (N2, N3 and N4). There are no noise sources associated with the Dunn's Park discharge outfall. The operation of the existing WwTP and discharge outfall facility therefore is neutral, not significant and long term. There is no change to the noise environment associated with the project (i.e. proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall), hence the effect is neutral, imperceptible and long term'.* This assessment stated that '*the residual operational noise and vibration effect associated with the Operational Phase is determined to be neutral, imperceptible and long term'.* Therefore there will no likely significant human health effects. Refer to Section 5.8.

A historical review of the 6-inch historic maps (1829-41) was carried out for Chapter 6 (Soils, Geology and Land) and confirmed that '*land use has been primarily a vacant area of slob lands and the 25-inch historic maps (1897-1913) shows the area occupied by regular fields following the completion of the 19th century reclamation works. The Cassini 6-inch historic maps (1830-1930) and aerial photographs (1995 to 2012) from the Ordnance Survey of Ireland) (OSI, 2023) and current aerial photography (Bing Maps, 2023) confirms that land use has been primarily agricultural until the construction of the Youghal WwTP in 2017*'. This assessment stated that '*residual effects with regards to land (including land take), soils or geology will be neutral imperceptible and long-term'.* Therefore there will no likely significant human health effects. Refer to Section 6.11.

Chapter 11 (Water) assessed the effects on water and human health and stated that *'There are no demolition, construction or decommissioning phases associated with the project. Taking account of the baseline environmental setting and the nature, scale and location of the project, any human health effects to onsite or offsite receptors as a result of surface water / transitional water effects will be imperceptible. No human health risks associated with potential exposure to contaminants (via. surface water / transitional water or groundwater pathways) resulting from the project are likely. No significant human health effects (via. water) are likely as a result of the project'.* Refer to Section 14.11.

AECOM (2023) completed a Marine Modelling study for the project to assessment the treated wastewater discharge from the Youghal WwTP to the Lower Blackwater Estuary / Youghal Harbour. This study was an assessment of the Youghal WwTP discharge to the Blackwater Estuary and the key receptors. The sensitive receptors included within the study were designated bathing waters, designated shellfisheries, classified production areas and designated aquaculture sites.

Taking the UIA approach, AECOM (2023) have confirmed that the impact on the receptors is that '*The assessments show that all bathing waters (and types of shellfish and aquaculture areas) achieve an indicative quality of "Excellent" bathing water status for both EC and IE. This is in line with the sampling reported on www.Beaches.ie for the past four years (2019 to 2022) at each of the beaches*.'

On this basis, there are no potential likely significant effects on human health associated with the operation phase. As a result of the above assessments and that there are no valid source-pathway-receptor linkages. As the above assessment (AECOM, 2023) confirm there is no significant effects on the receptors; '*Based on the*

findings above it is concluded that the Youghal WwTP, operating at the design capacity of 16 000PE and discharging through the Dunn's Park outfall, will not adversely impact.

- *The current WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies.*
- *The bathing water quality at the beaches (Youghal Front Strand and Claycastle).*
- *The water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay'* (AECOM, 2023).

9.7 Cumulative Effects

A review of all projects (committed developments, consented projects, granted / approved developments, and projects applied for relevant consents, and licensed and permitted projects) listed within Table 13.1 (Cumulative Impacts Assessment of Projects) of Chapter 13 has been undertaken. No significant cumulative effects are likely. The proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall will not act in combination with other project (listed in Table 13.1.) to result in any predicted cumulative effects on the population and human health are predicted. Therefore no significant cumulative effects are likely.

9.8 Mitigation

There are no predicted effects on the Population and Human Health which will require mitigation measures. There are no required mitigation measures associated with the project.

9.9 Residual Effects

There will be no residual effects with regards to Population and Human Health.

9.10 Do Nothing Scenario

The Site is located within Youghal. The do-nothing scenario will have a neutral and imperceptible effect on the Site with regards to Population and Human Health. There would be no difference in the 'do nothing' scenario, i.e. the current baseline; discharge treated effluent from Dunn's Park as a temporary discharge outfall and Youghal WwTP will continue to operate in its current format and capacity. The project will remain as is and will not have any effect on population and human health.

9.11 Monitoring

As the project will not require any mitigation measures for the human health and population, no monitoring is required.

9.12 Difficulties encountered

No difficulties were encountered during the preparation of this assessment.

10. Biodiversity

10.1. Introduction

The biodiversity chapter has been prepared by Paul O' 'Donoghue, Associate Director in Atkins who holds a BSc in Zoology, a Master degree in Behavioural Ecology, a PhD in Avian Ecology and Genetics and is a full member of Chartered Institute of Ecology and Environmental Management.

The project is described in Chapter 2 of the EIAR. This chapter deals specifically with elements of terrestrial ecology within the study areas as shown in Figure 10-1 ; but also comments on marine mammals and estuarine habitats (the latter are also addressed in detail in the accompanying NIS, (UÉ, 2023)). Refer to Appendix 10.1.

To summarise the project, UÉ are seeking to authorise the use of the Dunn's Park discharge outfall as the outfall on a permanent basis under WwDL Reg. No. D0139-03 in Co. Cork in accordance with Regulation 17 of the Wastewater Discharge (Authorisation) Regulations 2007, as amended (refer to Figure 1.1 for location of Dunn's Park outfall). Current operations at Youghal WwTP utilise the outfall pipe at Dunn's Park under a temporary licence. The existing outfall at Dunn's Park discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour.

There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. There are no changes to existing operational plant items, buildings, or operational hours within the existing WwTP, hence no changes to the operational phase of the WwTP and Dunn's Park outfall pipe will occur. Current operations are described in Section 2.1 of this EIAR.

The existing biodiversity of the site and connectivity with the surrounding areas was assessed through a desktop study as well as targeted ecology field surveys. This is described in more detail in Section 10.2, below.

Information in relation to potential effects on European sites is set out in detail in the Natura Impact Statement [NIS] submitted in Volume 3 Appendix 10.1 (Uisce Éireann, 2023).

Figure 10 .1 - Location of Study Area, Mudlands, Youghal

10.2. Methodology

10.2.1. Desk Study

A desk study and site visits were conducted to inform the ecological appraisal for permission for the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall at Youghal WwTP in Youghal, Co. Cork.

A desk study was carried out to collate information available in the vicinity of the proposed project. These areas were viewed using Google Earth, Google maps[19] and Bing maps[20] (last accessed on 22/05/2023).

The Environmental Protection Agency (EPA) mapping[21] system was used to identify any hydrological connection between the project and European sites.

Locations and boundaries of all European sites within the potential zone of influence of the project were identified and reviewed using the NPWS online map viewer. Boundary shapefiles were also downloaded from this website to facilitate the preparation of project graphics.

Desktop information on relevant European sites were reviewed on the NPWS website, including the site synopsis for each SAC/SPA, the conservation objectives, the site boundaries as shown on the NPWS online map viewer, the standard Natura 2000 Data Form for the SAC/SPA which details conditions and threats of the sites, and published information and unpublished reports on the relevant European sites.

The Map of Irish Wetlands[22] was reviewed for the presence of wetlands in the proximity of the site.

The National Biodiversity Data Centre (NBDC) were accessed for information on protected habitats and species known from the 1km grid squares X0979, X0978, X1079 and X1078 within which the site is located (last accessed 22/05/2023). Bat records within the immediate environs of the survey area were also reviewed using the NBDC website; these 4 1km were used as they overlap in full the project site. The objective was to find any published records of bats from the project environs.

The Botanical Society of Britain and Ireland (BSBI) mapviewer was access for information on flora and fauna in the vicinity of the project (last accessed 25/05/2023).

The conservation status of mammals within Ireland and Europe is evaluated using one or more of the following documents: Wildlife Acts (1976 - 2012), red lists such as the Red List of Terrestrial Mammals (Marnell *et al*., 2019) and the EU Habitats Directive 92/43/EEC.

Birds of Conservation Concern in Ireland (BoCCI), published by BirdWatch Ireland and the RSPB Northern Ireland, is a list of priority bird species for conservation action on the island of Ireland (Gilbert *et al*., 2021). The BoCCI lists birds which breed and/or winter in Ireland and classifies them into three separate lists; Red, Amber and Green; based on the conservation status of the bird and hence their conservation priority. Birds on the Red List are those of highest conservation concern, Amber List are of medium conservation concern and Green List are not considered threatened.

10.2.2. Site Surveys

An ecological walkover survey of the site was conducted by Paul O'Donoghue, Atkins on the 29th of September 2022 and again on parts of the site on the 17th of June 2023. The purpose of the survey was to characterise and record the habitats and sensitive ecological receptors within the site and wider lands from the WwTP to the shore at Dunn's Park. A Phase 1 habitat survey was undertaken in line with published best practice (Smith *et al*., 2011), with habitats classified in line with the Heritage Council Classification scheme (Fossitt, 2000). Dominant plant species in each habitat type were recorded. Plant nomenclature follows the Botanical Society of Britain and Ireland's List of Accepted Plant Names (Botanical Society of Britain and Ireland, 2007).

Incidental sightings and signs of birds, mammals, invertebrates and amphibians were noted during the walkover survey to further evaluate the importance of the site to flora and fauna (in line with the approach set out in the *Guidelines for Preliminary Ecological Appraisal* (CIEEM, 2017). The landscape value for bats was also considered (after e.g. Entwhistle *et al*., 2001; Lundy *et al*. 2011). Trees or structures suitable for bat roosts within the site and potential suitable bat foraging habitat were also noted during the daytime walkover of the Site.

With respect to terrestrial mammals the site walkover also looked for signs of mammals such as badger (Meles meles); it sought to establish the location of badger signs such latrines, snuffle holes, trails & setts) and immediate environs. However, much of the site was considered to offer limited potential for species such as badger due to

[19] https://www.google.ie/maps
[20] http://www.bing.com/maps/
[21] https://gis.epa.ie/EPAMaps/
[22] http://www.wetlandsurveysireland.com/wetlands/map-of-irish-wetlands--/map-of-irish-wetlands---map/

the fenced nature of the treatment plant site, the relatively high disturbance along the ring road and neighbouring parts of Youghal and the wet character of lands in the adjoining Mudlands.

During the ecological survey the presence of invasive plant species such as Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*) and Giant Hogweed (*Heracleum mantegazzianum*) were also recorded.

Aerial photos and site maps assisted the ecological walkover survey. The location of the project and the surrounding areas were viewed using Google Earth, Google maps and Bing maps. The EPA online mapviewer OSI Discovery series maps were used to locate watercourse networks.

In line with the guidance presented in *Guidelines for Preliminary Ecological Appraisal* (CIEEM, 2017) this survey was also used to scope the need for any additional ecological survey work.

The field survey on the 17th of June 2023 focused on plants species noted in the desk top assessment and invasive species, as well as any additional observations.

10.2.3. Evaluation of Ecological Receptors

This assessment was undertaken in line with '*Guidelines on the Information to be contained in Environmental Impact Assessment Reports*' published by the Environmental Protection Agency (EPA) in 2022. It was informed by the correspondence on EIAR Scoping received from the EPA (see Section 2.4.1).

Furthermore, the evaluation and impact assessment within this report has been undertaken with reference to relevant parts of the 2018 *Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland. Terrestrial, Freshwater, Coastal and Marine* - developed by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018; updated April 2022).

The importance of an ecological feature should be considered within a defined geographical context. The following frame of reference has been used in this case, relying on known / published accounts of distribution and rarity where available, and professional experience:

- International (European);
- National (Ireland);
- Regional (Munster);
- County (Cork);
- Townland (Youghal Mudlands); and,
- Local (intermediate between the Site and Townland).

Ecological features can be important for a variety of reasons and the rationale used to identify them is explained in the text. Importance may relate, for example, to the quality or extent of the site or habitats therein; habitat and / or species rarity; the extent to which such habitats and / or species are threatened throughout their range, or to their rate of decline.

This assessment of effects was undertaken in line with *Guidelines on the Information to be contained in Environmental Impact Assessment Reports*' published by the Environmental Protection Agency (EPA) in 2022. For example, as set out in Table 3.6 effects can be Positive, Negative or Neutral. With respect to scale of effect, these can range from Imperceptible; Not Significant; Slight Effects; Moderate Effect; Significant Effects; Very Significant through to Profound Effects (for definitions see Table 3.6 of EPA, 2022). The likelihood of an effect as well as its duration are described in Table 3.6 of EPA, 2022); and have been considered in this assessment.

10.3. Receiving Environment

10.3.1. Desktop Study

10.3.1.1. Designated Sites

European Designated Sites

The Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora) forms the basis for the designation of Special Areas of Conservation. Similarly, Special Protection Areas are classified under the Birds Directive (Council Directive 2009/147/EEC on the Conservation of Wild Birds). The Habitats and Birds Directives are transposed into Irish law by the EC (Birds and Natural Habitats) Regulations 2011 (Statutory Instrument No. 477/2011). Collectively, Special Areas of Conservation (SAC) and Special Protection Areas (SPA) are referred to as the Natura 2000 network. In general terms, they are considered to be of exceptional importance for rare, endangered, or vulnerable habitats and species within the European Community.

The 'zone of influence' (ZoI) for a project is the area over which ecological features may be subject to significant effects as a result of the project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries. The ZoI will vary for different ecological features depending on their sensitivity to environmental change (CIEEM, 2018).

Guidance on the AA process was produced by the European Commission (EC, 2001; 2018), which was subsequently used to develop guidance for Ireland by the Department of Environment, Heritage, and Local Government in 2009 (DEHLG, 2009) (see also National Parks and Wildlife Service in 2018[23]; (NPWS 2018). More recently the Office of the Planning Regulator published Appropriate Assessment Screening for Development Management (OPR Practice Note PN01; OPR, 2021).

When considering the potential for effects to European sites National Parks and Wildlife Service guidance and OPR (2021) advises that this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, the sensitivities of the ecological receptors, and the potential for in-combination effects. This assessment is present in detail in the accompanying NIS prepared by Uisce Éireann (UÉ) - *Natura Impact Statement as part of the Youghal WwTP Discharge Licence Review D0139-03. June 2023*. Refer to Appendix 10.1.

Information is also presented here on those European sites adjoining and in the immediate environs of the project. On land the project site is not located within a European site. It does however directly adjoin the Blackwater River (Cork/Waterford) SAC (002170[24]) and the Blackwater Estuary SPA (004028[25]). The Dunn's Park outfall pipe currently in use by Youghal WwTP under a temporary licence, discharges into the Blackwater Estuary which as mentioned above is designated as both a SPA (004028) and a SAC (002170) ;the outfall is located with both of these European sites.

There are four additional European sites potentially within the zone of influence of the project which were considered; specifically, Ballymacoda (Clonpriest and Pillmore) SAC (000077[26]), Ballymacoda Bay SPA (004023[27]), Ardmore Head SAC (002123[28]) and Helvick Head to Ballyquinn SPA (004192[29]). None of these additional four European sites are included within the potential Zone of Influence due to their distance from the Dunn's Park outfall and intervening volume of estuarine and coastal waters (see Table 10.1).

The Blackwater Estuary is also designated as a Ramsar site (no. 836) as is Ballymacoda (no. 831)[30]. Ramsar sites are wetland sites designated to be of international importance under the Ramsar Convention an intergovernmental environmental treaty established by UNESCO.

The Blackwater Estuary is also listed as an Important Bird Area by BirdLife International; site number IE091[31].

Table 10.1 - European sites potentially within the zone of influence of the project

Site	Number	Distance from project
Special Areas of Conservation		
Blackwater River (Cork/Waterford) SAC (NPWS, 2012a)	002170	Within
Ballymacoda (Clonpriest and Pillmore SAC (NPWS, 2015a)	002123	SAC is 5.5km to the southwest
Special Protection Area for Birds		
Blackwater Estuary SPA (NPWS, 2012b)	004028	Within
Ballymacoda Bay SPA NPWS, 2015b)	004023	SAC is 4.29km to the southwest

[23] https://www.npws.ie/development-consultations
[24] https://www.npws.ie/protected-sites/sac/002170
[25] https://www.npws.ie/protected-sites/spa/004028
[26] https://www.npws.ie/protected-sites/sac/000077
[27] https://www.npws.ie/protected-sites/spa/004023
[28] https://www.npws.ie/protected-sites/sac/002123
[29] https://www.npws.ie/protected-sites/spa/004192
[30] Ramsar sites in Ireland - http://irishwetlands.ie/irish-sites/
[31] http://datazone.birdlife.org/site/factsheet/blackwater-estuary-iba-ireland

Site	Number	Distance from project
Helvick Head to Ballyquinn SPA (NPWS, 2022)	004192	SPA is 11km to the east

The outfall at Dunn's Park is located within the Blackwater River (Cork/Waterford) SAC (002170); otherwise, the landward parts of the project are between 0m and 415m from the SAC. The Blackwater River (Cork/Waterford) SAC is designated for the following habitats and species: -

- [1130] Estuaries
- [1140] Tidal Mudflats and Sandflats
- [1220] Perennial Vegetation of Stony Banks
- [1310] Salicornia Mud
- [1330] Atlantic Salt Meadows
- [1410] Mediterranean Salt Meadows
- [3260] Floating River Vegetation
- [91A0] Old Oak Woodlands [91E0] Alluvial Forests*
- [1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*)
- [1092] White-clawed Crayfish (*Austropotamobius pallipes*)
- [1095] Sea Lamprey (*Petromyzon marinus*)
- [1096] Brook Lamprey (*Lampetra planeri*)
- [1099] River Lamprey (*Lampetra fluviatilis*)
- [1103] Twaite Shad (*Alosa fallax*)
- [1106] Atlantic Salmon (*Salmo salar*)
- [1355] Otter (*Lutra lutra*)
- [1421] Killarney Fern (*Trichomanes speciosum*)

[* Denotes a priority habitat.]

The outfall at Dunn's Park is located within the Blackwater Estuary SPA (000077); otherwise, the landward parts of the project are between 0m and 415m from the SPA. The Blackwater Estuary SPA is designated for a range of waterbirds and the wetlands upon which they depend: -

- [A050] Wigeon (*Anas penelope*)
- [A140] Golden Plover (*Pluvialis apricaria*)
- [A142] Lapwing (*Vanellus vanellus*)
- [A149] Dunlin (*Calidris alpina*)
- [A156] Black-tailed Godwit (*Limosa limosa*)
- [A157] Bar-tailed Godwit (*Limosa lapponica*)
- [A160] Curlew (*Numenius arquata*)
- [A162] Redshank (*Tringa totanus*)
- [A999] Wetland and Waterbirds

The project site is hydrologically connected to the Blackwater Estuary SPA and the Blackwater River (Cork/Waterford) SAC via the existing temporary outfall pipe at Dunn's Park. As noted this potential for effects on these sites are discussed in full in the accompanying NIS (Volume 3, Appendix 10.1).

There are no watercourses within the project site noted on the EPA mapviewer. There are, however, a number of drainage ditches which are crossed by the WwTP access road. These are linked to the coastal lagoon located inside the seawall. The northern part of the lagoon is within the Blackwater River (Cork/Waterford) SAC; it is not, however, within the Blackwater Estuary SPA which lies outside the seawall.

The River Muckridge (EPA Ref: IE_SW_18M310560) flows through the Mudlands to the north of Youghal WwTP. It enters the coastal lagoon located inside the seawall from where it then discharges into the Lower Blackwater

M[32] Estuary/Youghal Harbour transitional waterbody (EPA Ref: IE_SW_020_0100). This then flows into Youghal Bay coastal waterbody (EPA Ref: IE_SW_020_0000).

Natural Heritage Areas

Natural Heritage Areas (NHAs) are nationally designated sites, which are considered important for the habitat, species, or geological heritage. NHAs are legally protected under the Wildlife Amendment Act 2000. Proposed Natural Heritage Areas (pNHAs) are sites that are of significance for wildlife and habitats, but which have not as yet been statutorily designated; however, their ecological value is recognised by Planning and Licencing Authorities. There are no NHAs located within 5km of the project. Only two pNHAs, the Blackwater River and Estuary pNHA (000072) and Ballyvergan Marsh pNHA (000078), are located within 5km of the project.

Blackwater River and Estuary pNHA (000072) is located immediately to the east and south of the project, the Dunn's Park outfall pipe lies within the pNHA. This pNHA covers an extensive area along the main channel of the River Blackwater as well as including the River Bride. In the context of the project, the estuary adjoining the works is within both the SAC and pNHA. There is a small difference in boundaries – the yard to the south of the public walk and outside our works area at Dunn's Park is within the pNHA boundaries, but not within the SAC.

This pNHA lies within the Blackwater River (Cork/Waterford) SAC and the Blackwater Estuary SPA. This estuary is therefore addressed in the accompanying NIS (UÉ, 2023). Other features of note mentioned in the NPWS site synopsis (NPWS, 1995), include areas for growing willows along the river, such as at Cappoquin; none of these areas are within the project area.

Ballyvergan Marsh pNHA (000078) is located ca. 2.55km to the southwest of the project. The NPWS site synopsis describes the site as follows (NPWS, 2009): -

> *"Ballyvergan Marsh is located on the south coast, about 3 km south-west of Youghal town. The site extends for over 2 km along its long axis and is on average 500 m in width. The main Cork road runs to the north of the site.*
>
> *The marsh comprises a large reed swamp, dominated by Common Reed (*Phragmites australis*). A variety of the larger sedges also occur (*Carex riparia, C. acuta, C. pseudocyperus *and* C. acutiformis*), whilst Water Dock (*Rumex hydrolapathum*), Purple-loosestrife (*Lythrum salicaria*) and Branched Bur-reed (*Sparganium erectum*) grow interspersed among the sedges. On muddier ground, which is flooded only in winter, Celery-leaved Buttercup (*Ranunculus sceleratus*) and Nodding Bur-Marigold (*Bidens cernua*) are found. There is also some scrub (*Salix *spp.) and marginal areas of fen and wet grassland. The marsh is separated from the sea by a shingle bank and sand hills. A nearby area of coastal clay/sand cliff is included in the site – the rare Red Data Book species Wild Clary (*Salvia verbenaca*) has been recorded growing here in abundance, along with such species as Kidney Vetch (*Anthyllis vulneraria*) and Red Fescue (*Festuca rubra*).*
>
> *The site supports an excellent diversity of bird species associated with swamp vegetation. During the 1990s, it had the largest population of Reed Warbler in Ireland, with an estimate of between 25 and 50 breeding pairs by 1995/96. Sedge Warbler also breeds throughout the site. Other breeding birds include Moorhen, Water Rail, Mallard, and Reed Bunting. Ballyvergan Marsh is a notable passage migration point for a range of passerine species in late summer and autumn. Regular ringing since 1989, which has involved the banding of over 15,000 birds, has shown the site to be of major importance for migrating Swallows and Sedge Warblers. Other species which are recorded regularly include Reed Warbler, Willow Warbler, Wren and Blue Tit. The high concentration of small birds regularly attracts birds of prey. Of particular note is that the site is a winter roost for Hen Harrier, with up to 5 individuals recorded in some years.*
>
> *Grazing is the main land use within the site, mainly in marginal areas. Owing to its proximity to Youghal town, the greatest threat comes from land reclamation. Largescale reed burning had occurred in the past though has not been noted in recent years. The site includes the largest freshwater coastal marsh in Co. Cork and supports a diversity of well-developed plant communities. It is of additional botanical importance as a site for the rare Wild Clary. Ballyvergan Marsh is also of ornithological importance, as a pre-migration stop-over point for various passerine species on their way to wintering grounds further south, and as a breeding site for Reed Warbler, still a very localised species in Ireland. The presence of Hen Harrier is of significance as this species is listed on Annex I of the E.U. Birds Directive."*

Given its location adjoining the outer part of the estuary, Ballyvergan Marsh pNHA is not hydrologically linked to the project site and is therefore considered outside the potential zone of influence of the project, given its distance,

[32] M denotes Munster

the absence of surface hydrological pathways, the absence of landscape connectivity, and the localised nature of the project.

Table 10.2 - Proposed Natural Heritage Areas relevant to the project

Site	Number	Distance
Blackwater River and Estuary	000072	Within
Ballyvergan Marsh	000078	2.55km Southwest over land

Nature Reserves

The closest designated nature reserve to the project is Capel Island and Knockadoon Head Nature Reserve[33] this is described by the NPWS as follows: - "*These reserves comprise all of Capel Island off the south coast near Youghal, Co. Cork, part of Knockadoon headland opposite the island and the intervening sea area. The reserve comprises 143.0 hectares, of which 126.9 are State-owned and 16.1 are privately owned.*" There are no other nature reserves located within 5km of the project.

There are no designated Wildfowl Sanctuaries by NPWS in the zone of influence of the project[34].

Other non-statutory designated sites of ecological value

Wetlands Survey Ireland (https://www.wetlandsurveys.ie/) hosts a Map of Irish Wetlands, wetland sites within the Blackwater estuary are listed below in Table 10.3. The Blackwater Estuary SPA (Cork) and Blackwater Estuary SPA (Waterford) are also listed (International importance). Overlap with designated sites for other wetlands is referenced below.

Table 10.3 - Map of Irish Wetlands sites in the vicinity of the project

Site name	Site code	Rating	Details
Blackbog – Blackwater River (Cork/Waterford) SAC	WMI_WD221	International	Artificial pond, wet grassland, salt marsh, scrub on the eastern side of the estuary, in the townland of Blackbog, Co. Waterford; within both the SAC and SPA (Waterford Wetland Survey, 2015). This site does not overlap with the project.
Ferry Point – Blackwater River (Cork/Waterford) SAC	WMI_WD240	International	Small brackish water lake separated from sea by road on northern side and shingle bank to the south. Occurs at eastern end of small peninsula that includes areas of grassland and scrub with shingle communities at Ferrypoint, Co. Waterford. Located <1km to the southeast of Dunn's Park, on the eastern side of the estuary; within the SAC and just outside the southern boundary of the SPA (Waterford Wetland Survey, 2015). This site does not overlap with the project.
Rincrew - Blackwater River (Cork/Waterford) SAC	WMI_WD276	International	Areas of saltmarsh and tidal river in the Tourig Estuary; within both the SAC and SPA (Waterford Wetland Survey, 2015). This site does not overlap with the project.
Muckridge Pond	WMI_CO264	Unknown	Lake, wet grassland and scrub within the old clay pits north of Youghal (to the northeast of Ballyvergan Marsh). This site does not overlap with the project.

[33] https://www.npws.ie/nature-reserves/cork/gearagh-nature-reserve
[34] https://www.npws.ie/protected-sites/wildfowl-sanctuaries

Site name	Site code	Rating	Details
Dysart Claycastle Ponds	WMI_CO266	Unknown	Area of lake, reedswamp, scrub and artificial pond in the townland of Claycastle, west of Youghal. This site does not overlap with the project.
Ballyvergan Marsh	WMI_CO44	National	Large area of fen, reedswamp, marsh and scrub. Overlaps with Ballyvergan Marsh pNHA. This site does not overlap with the project.
Blackwater Estuary SPA (Waterford)	WMI_WD178	International	Blackwater River estuary includes well-developed marsh communities, numerous dry woodlands, sedges and reedbeds. The site supports large numbers of various species of wintering waterbirds. RAMSAR site. The project areas adjoins but is not located within the SPA. [Blackwater Estuary SPA is also discussed in the accompanying NIS (UÉ, 2023)].
Blackwater Estuary SPA (Cork)	WMI_CO60	International	The site contains a moderately sized, sheltered south-facing river estuary. Salt marshes fringe the estuarine channels, especially in the sheltered creeks. The site is of high ornithological importance for waterfowl especially Black-tailed Godwit. Ramsar site. The project areas adjoins but is not located within the SPA. [Blackwater Estuary SPA is also discussed in the accompanying NIS (UÉ, 2023)].

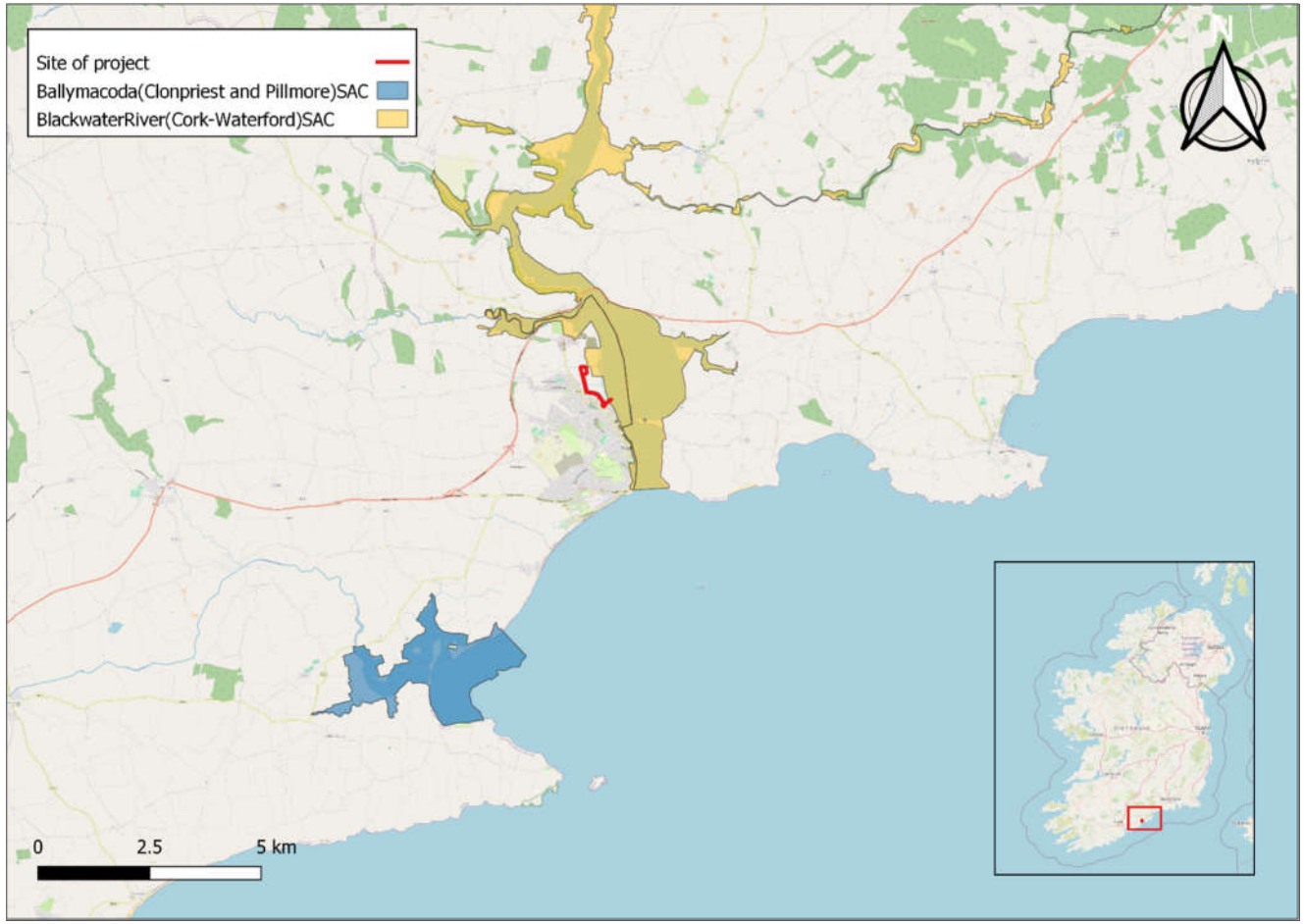


Figure 10.2 - Special Areas of Conservation (SACs) in relation to the project at Youghal, Co. Cork [BaseMap Source: QGIS Maps].

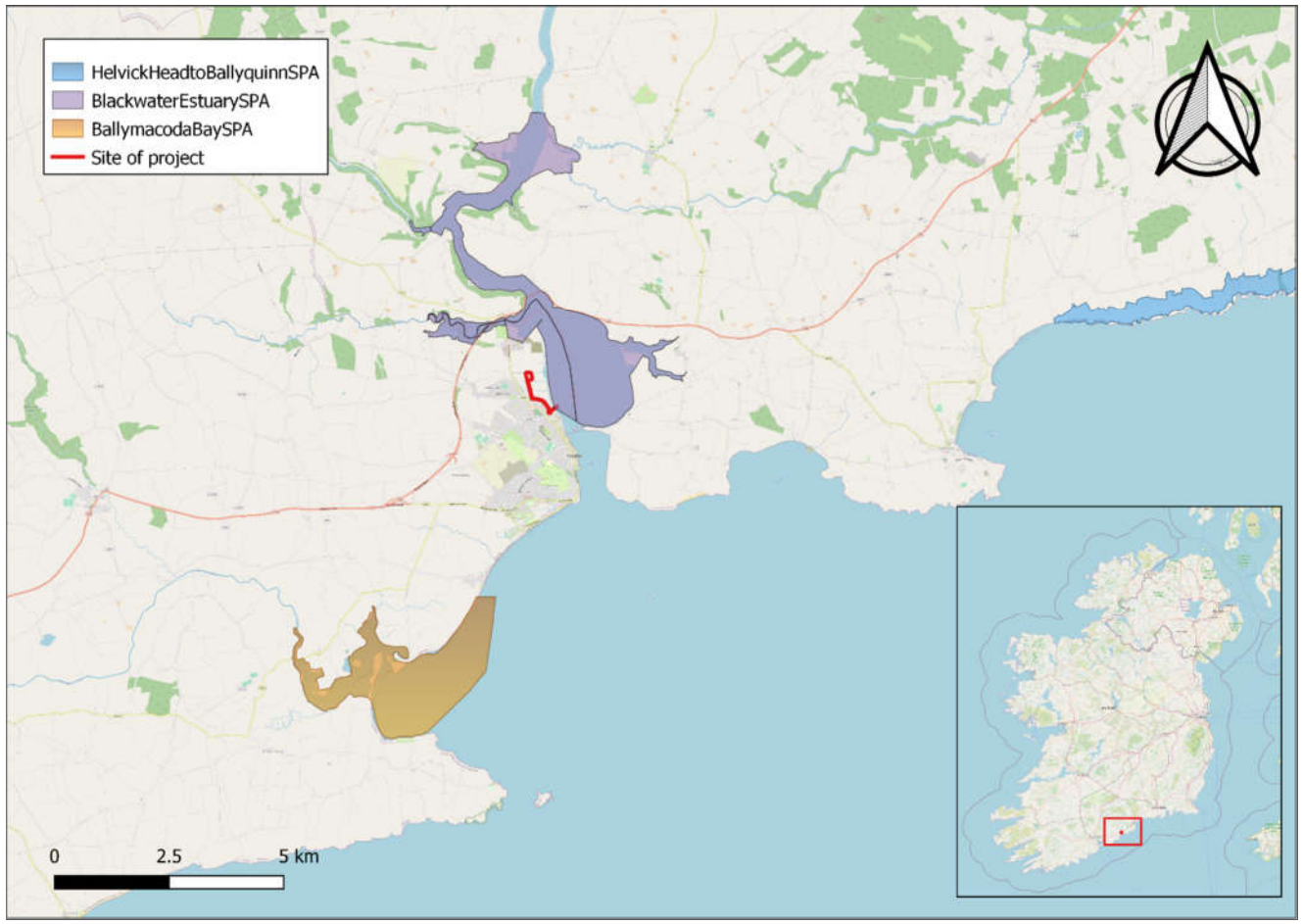


Figure 10.3 - Special Protection Areas for birds (SPAs) in relation to the project at Youghal, Co. Cork [Basemap Source: QGIS Maps]

10.3.1.2. Rare and Protected Flora and Fauna

In order to fully understand baseline ecology (as per EPA Guidance, EPA, 2022), the NBDC database was searched for records of note within the 1km grid squares within which the project boundary is located (X1078, X1079, X0978, X0979). The records are presented in Table 10.4 below.

X0978 - The records of water beetle all date to 1907; suitable habitat is not present within the project area. Large Red Tailed Bumble Bee was recorded from the environs of Mill Road to the southwest of the site; while the Hedgehog record is from Kenny's Lane ,Youghal (NBDC hosts a large number of hedgehog records from throughout Youghal and environs to the south of the works).

X0979 – Hedgehog – road kill on the R634, at Foxhole northwest of the site.

X1078 - Common broomrape, Corn marigold and Round-leaved Crane's-bill were recorded on the Youghal Mudlands Slob Bank, as was Slender thistle which was noted further north along the South Slob walk / embankment (X102787). Round-leaved Crane's-bill was recorded also in 2009 (X103784); in the area where the public path enters the slobs from the footpath. This is an area that is subject to significant and ongoing disturbance.

X1079 – Otters are frequently encountered using the lagoons alongside the South Slob walk / embankment to the north of the works area. Gipsy Cuckoo Bee was recorded in the Mudlands to the north and outside the works area.

Table 10.4 - NBDC - Rare and Protected Flora and Fauna

Species	Date of record	Protected Status	Source
X0978			
Agabus (Gaurodytes) conspersus	12/07/1907	Threatened Species: Endangered	Water Beetles of Ireland
Enochrus melanocephalus	12/07/1907	Threatened Species: Near Threatened	Water Beetles of Ireland
Ochthebius (Ochthebius) marinus	12/07/1907	Threatened Species: Near Threatened	Water Beetles of Ireland
Large Red Tailed Bumble Bee (Bombus (Melanobombus) lapidarius)	02/08/2022	Threatened Species: Near Threatened	Bees of Ireland
West European Hedgehog (Erinaceus europaeus)	18/02/2021	Protected Species: Wildlife Acts	Hedgehogs of Ireland
X0979			
West European Hedgehog (Erinaceus europaeus)	20/05/2010	Protected Species: Wildlife Acts	Roadkill Survey
X1078			
Corn marigold (Glebionis segetum)	16/06/2020	Threatened Species: Near Threatened	Community Foundation for Ireland Records
Round-leaved Crane's-bill (Geranium rotundifolium)	16/06/2020	Threatened species: Endangered	Community Foundation for Ireland Records
Slender Thistle (Carduus tenuiflorus)	13/07/2019	Threatened Species: Near threatened	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards

Species	Date of record	Protected Status	Source
Brown Long-eared Bat (Plecotus auritus)	04/10/2002	Protected Species: EU Habitats Directive || Annex IV || Protected Species: Wildlife Acts	National Bat Database of Ireland
European Otter (Lutra lutra)	23/12/2022	Protected Species: EU Habitats Directive || Annex II || Annex IV || Protected Species: Wildlife Acts	Mammals of Ireland 2016-2025
Pipistrelle (Pipistrellus pipistrellus sensu lato)	04/10/2002	Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts	National Bat Database of Ireland
X1079			
Gipsy Cuckoo Bee (Bombus (Psithyrus) bohemicus)	07/09/2012	Threatened Species: Near Threatened	Bees of Ireland

The current list of plant species protected by Section 21 of the Wildlife Act 1976 is set out in the Flora Protection Order 2022 (FPO) (https://www.irishstatutebook.ie/eli/2022/si/235/made/en/pdf), which gives legal protection to 65 species of bryophytes and 89 species of vascular plants in Ireland. According to the NPWS Flora Protection Order Bryophyte Map Viewer, protected bryophyte species (in accordance with the FPO) *Scleropodium touretii*, has been recorded within 400m of the project. *Scleropodium touretii* is classed as an Endangered on the FPO, however this record exists from 1951. There are no current records of this species on the NBDC database.

According to the NBDC database, Round-leaved Crane's-bill (*Geranium rotundifolium*) was recorded in 2020 within the 100m grid square X103784 at Youghal Mudlands Slob Bank, which lies within the project site. Round-leaved Crane's-bill is classed as an Endangered species. The Botanical Society of Britain and Ireland (BSBI) mapviewer was subsequently consulted, which confirmed the presence of Round-leaved Crane's-bill within the bounds of the project site. This is not listed on FPO, 2022.

Corn marigold was recorded within the 1km square X1078 in 2020 on the NBDC database. Records similarly exist on the BSBI mapviewer up to 2019. This plant species is listed as Near Threatened. Also listed as a Near Threatened species, slender thistle (*Carduus tenuiflorus*) has been recorded in 2019 within the X102787 100m grid square which lies directly east of the project site. This species was found inhabiting disturbed ground (NBDC, 2023). This is not listed on FPO, 2022.

The 2012 record of the Gipsy Cuckoo Bee (*Bombus (Psithyrus) bohemicus*) does not lie within the project site.

The site is located in an area with suitability for bats score of 29% (Lundy *et al*., 2011)[35]. Individual bat species which score the highest suitability percentages include Brown long-eared bat (*Plecotus auratus*), Soprano pipistrelle (*Pipistrellus pygmaeus*), and Common pipistrelle (*Pipistrellus pipistrellus*) which likely utilise the mature trees in the environs of the project.

A data request was also submitted to the NPWS for information on rare and protected plant and animal species within a 1km radius of the project; a response was received in May 2023. The majority of records while within the same 10km grid square are not located close to the project.

There are historic records of Common frog (*Rana temporaria*) from the Mudlands north of the site; frogs are likely to occur in wet habitat throughout the area where waters are not brackish,(many of the Mudland waterbodies are however brackish in character). Records of Sea-kale (*Crambe maritima*) are from Ferrypoint / Monatray on the Waterford side of the channel, with a single record along shoreline in Youghal over 500m south of the works area.

[35] http://maps.biodiversityireland.ie/metadata/Landscape_Conservation_for_Irish_Bats_metadata(v.3).pdf

10.3.1.3. Bats

The review of existing records of bat species in the area of the site indicates that two of the ten known Irish species of bat have been recorded within a 2km radius of the project (last checked May 2023). These two bat species are the common pipistrelle (*Pipistrellus pipistrellus*) and the long-eared bat (*Plecotus auritus*). None of these species have been recorded roosting in the environs of the project. As aforementioned, there is some roost potential in the mature trees identified in 2022 and 2001 ecological surveys.

The bat landscape association model (Lundy *et al*., 2011) suggests that the project site is part of a landscape that is of low suitability for bats (landscape suitability shown in %) including common pipistrelle (41%), soprano pipistrelle (*Pipistrellus pygmaeus*) (44%), brown long-eared (45%), Leisler's (*Nyctalus leisleri*) (38%), Daubenton's (*Myotis daubentonii*) (23%), natterer's (*Myotis nattereri*) (32%) and whiskered bat (*Myotis mystacinus*) (25%). The site and its environs are of low suitability for Nathusius' pipistrelle (*Pipistrellus nathusii*) and is outside of the core distribution range for lesser horseshoe bat (*Rhinolophus hipposideros*) (Roche *et al.*, 2015).

As part of an application for a solar farm on the Mudlands north of the WwTP Malone O'Regan (MOR, 2020) undertook bat surveys on behalf of the Applicant. (planning ref. No. 20/04407; Cork County Council). They recorded Common pipistrelle, Soprano pipistrelle and Lesser noctule (i.e. Leisler's bat) foraging and commuting along the hedges and treelines on their site. Common pipistrelle, Soprano pipistrelle were the most commonly encountered. These species are likely to occur more widely with the Mudlands.

10.3.1.4. Invasive Species

Records of invasive species hosted on NBDC are as set out in Table 10.5.

New Zealand Pigmyweed was recorded in 2021 from a drain alongside the WwTP access road (X098787).

Harlequin Ladybird was recorded in a housing estate on the western side of the R634 (Copperalley).

Common broomrape and Japanese knotweed were recorded from the South Slob walk / embankment.

Table 10.5 - NBDC – Invasive species records

Species	Date of record	Protected Status	Source
X0978			
New Zealand Pigmyweed (Crassula helmsii)	08/03/2021	High Impact Invasive Species || Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)	National Invasive Species Database
Sycamore (Acer pseudoplatanus)	16/06/2020	Medium Impact Invasive Species	Community Foundation for Ireland Records
Traveller's Joy (Clematis vitalba)	16/06/2020	Medium Impact Invasive Species	Community Foundation for Ireland Records
Harlequin Ladybird (Harmonia axyridis)	18/04/2015	High Impact Invasive Species || Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)	Ladybirds of Ireland
X1078			
Butterfly-bush (Buddleja davidii)	16/06/2020	Medium Impact Invasive Species	Community Foundation for Ireland Records
Common Broomrape (Orobanche minor)	16/06/2020	Medium Impact Invasive Species	Community Foundation for Ireland Records
Japanese Knotweed (Fallopia japonica)	16/06/2020	High Impact Invasive Species || Invasive Species >> Regulation S.I. 477 (Ireland)	Community Foundation for Ireland Records

Species	Date of record	Protected Status	Source
Sycamore (Acer pseudoplatanus)	16/06/2020	Medium Impact Invasive Species	Community Foundation for Ireland Records

10.3.1.5. Watercourses

There are no watercourses within the project site noted on the EPA mapviewer. There are, however, a number of drainage ditches which are crossed by the WwTP access road. These are linked to the coastal lagoon located inside the seawall. The northern part of the lagoon is within the Blackwater River (Cork/Waterford) SAC; it is not, however, within the Blackwater Estuary SPA which lies outside the seawall. The project does not include any works or changes to these drains or existing patterns of surface water drainage.

The River Muckridge (EPA Ref: IE_SW_18M310560) flows through the Mudlands to the north of Youghal WwTP. It enters the coastal lagoon located inside the seawall from where it then discharges into the Lower Blackwater M[36] Estuary/Youghal Harbour transitional waterbody (EPA Ref: IE_SW_020_0100). This then flows into Youghal Bay coastal waterbody (EPA Ref: IE_SW_020_0000) (see Figure 11.1). It lies outside the project and will not be altered.

A review of surface and groundwater quality is presented in Chapter 11 (for surface water see 11.4: hydrology; for groundwater see 11.5: hydrogeology); water quality is also addressed in the accompanying NIS (UÉ, 2023).

Section 11.4.2 further discusses EPA Registered Protected Areas, which includes Drinking Waters; Bathing Waters; Shellfish Areas and Nutrient Sensitive Areas (for a full discussion see section 11.4.2 and Appendix 11.1 and 11.2 for AECOM marine modelling reports (2020, 2023)).

10.3.1.6. Intertidal and Benthic Ecology

The discharge location was visited by UÉ ecologists on low Spring tide in January 2020 and May 2023. The discharge enters Youghal Harbour directly into sand/mudflat habitat. No evidence of pollution was observed during the site visits. The location of the discharge lies at the transition from '*Intertidal estuarine sandy mud community complex*' and '*Sand and mixed sediment with polychaetes community complex*' marine habitats. These two habitat types dominate inner Youghal harbour north of Ferry Point. A small area of *Zostera* dominated community habitat is located to the north of the Mudlands (as shown in Map 5 of NPWS, 2012 - Conservation Objectives: Blackwater River (Cork/Waterford) SAC 002170. Version 1.0). Outer Youghal Harbour south of Ferry point is dominated by Coarse sediment community complex. There are a number of areas of *Mytilus edulis* dominated communities mostly to the eastern half of inner Youghal Harbour. There is also one small area located just to the south of Ferry Point. Other habitat types with *Mytilus edulis* in a patchy distribution are located opposite the discharge point, mostly to the middle of the Harbour and south of the discharge (refer to the NIS (UÉ, 2023) for detailed assessment of marine habitats).

Modelling of the discharge by AECOM (2020;2023) found that the plumes of dispersing effluent do not result in formal mixing zones (within which nutrient EQS's are exceeded) for any modelled scenario. As such there will be no impact on marine habitats within Youghal Harbour as there is no impact on water quality (See Water Quality Chapter and NIS (UÉ, 2023) or further detail).

10.3.1.7. Marine Fauna

Cetaceans

Cetaceans are protected under Annex IV of the EU Habitats Directive and so it is an offence to deliberately capture, kill, injure or deliberately disturb them. Bottlenose dolphin (*Tursiops truncates*) and Harbour porpoise (*Phocoena phocoena*) are also listed under Annex II of the EU Habitats Directive requiring the designation of SACs for their conservation. There are no SACs designated for Bottlenose dolphins or Harbour Porpoise in Youghal or within 100km.

There are at least 24 species of cetacean which occur in Irish waters of which ten species are considered to be resident; Harbour porpoise, Atlantic white-sided dolphin (*Lagenorhynchus acutus*), White-beaked dolphin (*Lagenorhynchus albirostris*), Bottlenose dolphin, Common dolphin (*Delphinus delphis*), Risso's dolphin (*Grampus griseus*), Killer whale (*Orcinus orca*), Northern bottlenose whale (*Hyperoodon ampullatus*), Long-finned pilot whale (*Globicephala mela*) and Sperm whale (*Physeter macrocephalus*). Six species are considered seasonally present: Minke whale (*Balaenoptera acutorostrata*), Blue whale (*Balaenoptera musculus*), Fin whale (*Balaenoptera physalus*), Sei whale (*Balaenoptera borealis*), Humpback whale (*Megaptera novaeangliae*) and Striped dolphin (*Stenella coeruleoalba*). Species which have been recorded within Youghal Bay include Harbour

[36] M denotes Munster

porpoise, Bottlenose dolphin, Common dolphin, Risso's dolphin, Fin whale and Minke whale (IWDG, 2021). Bottlenose dolphin are the only species which have been recorded in Youghal harbour just south of Ferry Point.

Seals

There are two species of seal which are resident in Ireland Grey Seal (*Halichoerus grypus*) and Common/Harbour Seal (*Phoca vitulina*). Both species are listed under Annex II of the EU Habitats Directive. There are no designated sites for either species within 70km of Youghal Harbour.

Grey seals in Ireland generally breed between September and December on undisturbed islands of the coast. There are records of Grey Seal within Youghal Bay but not in the harbour or estuary (NBDC,2023). Common seals come to shore in June to give birth and mate. There are records of Common seal upstream of Youghal Bridge on the River Blackwater (NBDC,2023). As such they are present within inner Youghal Harbour.

Birds

For discussion of birds using the estuary / Blackwater Estuary SPA, please refer to the accompanying NIS (UÉ, 2023).

10.3.2. Field Survey Results

10.3.2.1. Baseline Ecology Survey

An ecological walkover survey was most recently undertaken by Atkins ecologist, Paul O'Donoghue on the 29th of September of 2022 and again on parts of the site on the 17th of June 2023. Photos of the most recent site visit are presented below.

The site of the WwTP is characterised by a central area of built land (BL1). This is in turn surrounded by amenity grassland (GA2), which grades into grassy embankments covered in dry meadow and grassy verges (GS2), often characterised by a mix of early successional species. Species encountered in the grassland areas were all common and included Yorkshire fog, dandelion, white clover, ribwort plantain, groundsel, winter heliotrope, broad-leaved dock, with occasional young gorse, soft rush, meadowsweet, hedge bindweed, common figwort and chickweed. In places the amenity grassland is quite bare, with species such as centaury noted, suggesting a more calcareous influence. There are some trees planted on the embankment which do not seem to be thriving (e.g. *Prunus* sp.; rowan); with in places young willow also becoming established on the embankment. *Montbretia* was also noted in a number of locations on the bank immediately surrounding the north side of the plant, which in places is also heavily overgrown by gorse.

Where the site grades into the western boundary there was a line of boundary planting dominated by hawthorn and blackthorn along the palisade fence, which blends into young alder in the north-western corner of the site. Gorse also begins to dominate in this corner of the site. Lower ground leading down to the boundary is dominated by young willow, as well as thistle, nettle, hedge woundwort and bindweed. Other species noted included gorse bramble, nettle, broad-leaved willowherb, comfrey,

A small area of thistle dominated grassland is located outside the berm at the south-eastern corner of the site. This is bordered by young gorse as well as a small patch of willow, with a small group of alder also developing (immature woodland, WS2). Young blackthorn and hazel dominate the southwestern boundary planting along the palisade fence.

The western side of the access road to the plant is lined by a mature treeline (WL2). Tree / shrub species present include an unusual and diverse mix of native and non-native species, including hawthorn, butterfly bush, *Griselenia*, blackthorn, sycamore, hazel, holm oak, grey willow, white willow, poplar spp, alder, guelder rose and crab apple and ash. The ash tree noted was showing signs of ash die-back. The understorey included meadow vetchling, great willowherb, mare's-tail, ivy, hedge bindweed, bramble, hogweed, young ash trees and nettle. In contrast the eastern side is lined by a palisade fence which separates the road from habitats such as wet grassland (GS4), recolonising bare ground (ED3; what looks like an old site compound) and a small pocket of alder / sycamore woodland (WD1) within the Mudlands. The area of ED3 included large areas of butterfly bush as well as other species often encountered on such bare ground, including teasel, ragwort, sycamore saplings and *Montbretia*.

The relief road is likewise defined as built land (BL1). It is lined on both sides by mature treelines (WL2) over amenity grassland (GA2). Species noted include white willow, sycamore, a purple maple sp., sweet chestnut, whitebeam, ash etc.

Dunn's Park is a mix of amenity grassland and built land. There was no evidence of Japanese knotweed at this location during either the visit on the 29th of September 2022 or 17th of June 2023. There was also no sign of mammals such as badger using any of the areas surveyed.

The last part of the study area is along the public path opposite Dunn's Park pumping station which runs out to the South Slob walk / embankment. This is characterised as spoil and bare ground (ED2), bordered by heavily

managed amenity grassland (GA1) and a band of scrubby vegetation which include winter heliotrope, broad-leaved dock, comfrey, nettle, thistle, bindweed and extensive mallow.

None of the habitats recorded are of more than **low local ecological value** (NRA, 2009); though they do adjoin areas such as within the Mudlands which can be of up to international importance. None of the latter, however, are within the project area.

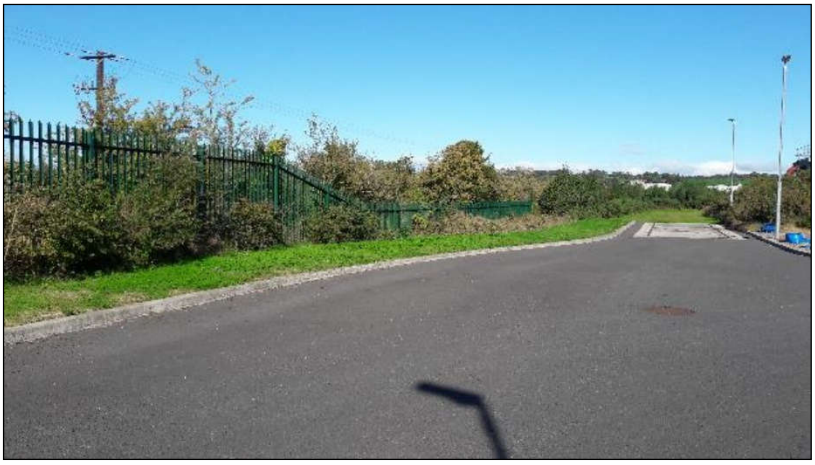


Plate 10-1 - Western boundary of the WWTP.

Plate 10-2 - Berm around the WWTP, heavily overgrown with gorse.

Plate 10-3 - Youghal WWTP.

Plate 10-4 - Grassy embankment on north side of the plant.

Plate 10-5 - Winter heliotrope and Montbretia.

Plate 10-6 - Open amenity grassland (GA2).

Plate 10-7 - Small group of willow / alder in southeast corner.

Plate 10-8 - Butterfly bush growing just outside plant boundary.

Plate 10-9 - Mudlands adjoining eastern side of access road.

Plate 10-10 - Area of ED3 adjoining eastern side of access road.

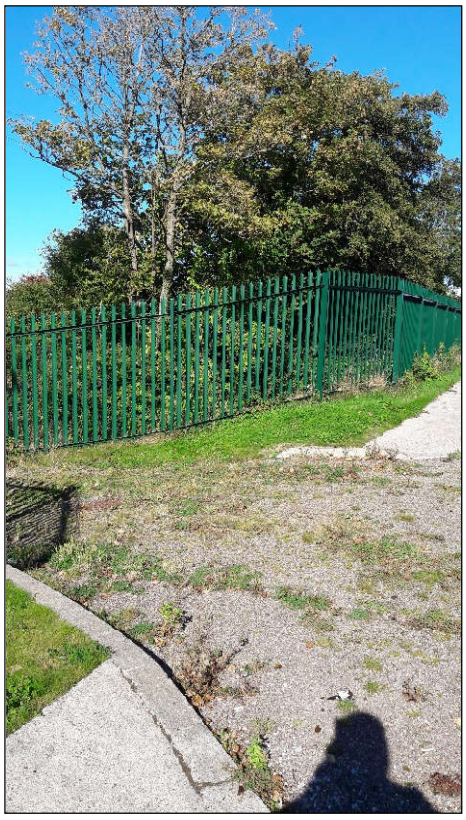


Plate 10-11 - Treeline on western side of the access road.

Plate 10-12 - Mudlands adjoining eastern side of access road.

Plate 10-13 - Treeline relief road (1) – looking east.

Plate 10-14 - Treeline relief road (2) – looking east.

Plate 10-15 - Treeline relief road – looking west.

Plate 10-16 - Dunn's Park pump station.

Plate 10-17 - Public path leading to the South Slob walk / embankment.

Plate 10-18 - Area of bare ground adjoining the public path.

Plate 10-19 - Dunn's Park outfall pipe.

Plate 10-20 - View from land of outfall pipe at Dunn's Park.

10.3.2.2. Fauna

There was no sign of mammals such as badger using the project site. Signs of badger have been recorded from north of the WwTP (MOR, 2023).

There are no watercourses within the project that would support Otter. The most suitable such watercourse is the Muckridge which is located north of the WwTP. Otherwise, areas of habitat that could be used by Otter all lie to the east of the WwTP; in the Mudlands; the coastal lagoon and in the Blackwater Estuary (as well as in the Tourig Estuary to the north). Otter are commonly recorded from these habitats.

As noted, there are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. No vegetation clearance is therefore proposed. The need for a targeted bat survey or breeding bird survey was therefore scoped out, as there will be no vegetation clearance and no alteration to areas of semi-natural that could be used by bats within or close to the project or which could be used by nesting birds.

As noted, UÉ are seeking to authorise the use of the Dunn's Park discharge outfall on a permanent basis. However, the project will not involve any construction, demolition, or removal of vegetation. There will therefore be no loss of vegetation that could be used by breeding or wintering bird populations. The need for targeted bird surveys was therefore scoped out as there will be no direct (e.g. habitat loss) or indirect (e.g. disturbance) negative impacts to bird species arising from the continuation of use of the outfall. The population impact on water quality was modelled by AECOM (2022, 2023) and is considered with respect to qualifying interests of Blackwater Estuary SPA in the accompanying NIS (UÉ, 2023).

10.3.2.3. Rare Plants / Invasive Species

The area at Dunn's Park and the walkway out to the South Slob walk / embankment was walked on the 17th of June 2023 to look for signs of rare plants, notable round-leaved crane's-bill, corn marigold and slender thistle (though as mentioned this was recorded further north from the project study area). No evidence of these species was recorded within the project site or immediately adjoining it.

In the case of round-leaved crane's-bill, no evidence was noted, instead small-flowered cranesbill was recorded along the pathway in a number of locations.

The area of bare ground adjoining the site showed signs of extensive storage of organic material, soil and garden waste (Plate 10.21). Garden flowers could be seen growing from some of this material. As corn marigold is frequently included in garden / wild flower seed mixes caution should be exercised in interpreting its record in this area.

The pathway was also heavily managed (Plate 10.22).

There was no evidence of Japanese knotweed at this location during either the visit on the 29th of September 2022 or 17th of June 2023.

Plate 10-21 - Storage of organic material, soil and garden waste near Dunn's Park.

Plate 10-22 - Public path at Dunn's Park.

10.4. Potential Effects on Biodiversity

10.4.1. Construction Effects

As noted, the project is for the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall at Youghal WwTP under Discharge Licence (Reg. No. D0139-03) in Co. Cork.

There are no physical changes occurring with Dunn's Park discharge outfall and there are no changes required to the existing infrastructure to facilitate the project, therefore no vegetation clearance, demolition, construction or decommissioning phases will occur (this is described in full in Section 2 of this EIAR). The existing WwDL (D0139-01) relates to the maximum design capacity of 16,000 P.E which will not be altered or changed as part of this EIAR. Furthermore, no alterations are proposed to any of the surface water overflows (SWO's) within Youghal agglomeration.

10.4.1.1. Designated Sites

The potential for effects on European sites are covered in the accompanying NIS prepared by Uisce Éireann (2023). The NIS Concluding Statement is as follows:-

"This NIS has been prepared following the EPA (2009) 'Note on Appropriate Assessments for the purposes of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007)'. The Department of the Environment, Heritage and Local Government guidance 'Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities' (DoEHLG, 2009) has also been taken into account. This NIS for the Waste Water Discharge Licence Review investigates the potential adverse effects on the aquatic qualifying interests of the Natura 2000 network arising from the plant discharge, in combination with other plans / projects affecting the aquatic environment. The assessment considers whether the discharge, alone or in combination with other projects or plans, will have adverse effects on the integrity of a European site, and includes consideration of any mitigation measures that may be necessary to avoid, reduce or offset negative effects. Its purpose is to assist the competent authority in carrying out its AA of the proposed licence review.

Based on the assessment herein it has been concluded that there will be no adverse effects on the integrity of Blackwater River (Cork/Waterford) SAC, Ballymacoda (Clonpriest and Pillmore)SAC, Blackwater Estuary SPA, Ballymacoda Bay SPA and Helvick Head to Ballyquin SPA or any European Site, in view of these site's conservation objectives and that the conservation status of the Annex I habitats, Annex II species or Annex I bird species, will not be compromised by the WwTP and agglomeration discharges either directly, indirectly or cumulatively.

It is therefore concluded that the Youghal WwTP and agglomeration discharges, alone or in-combination with other plans and / or projects will not give rise to adverse effects on the integrity of Blackwater River (Cork/Waterford) SAC, Ballymacoda (Clonpriest and Pillmore) SAC, Blackwater Estuary SPA, Ballymacoda Bay SPA and Helvick Head to Ballyquin SPA, or any European Site (UÉ, 2023)."

Within the project Dunn's Park outfall pipe is within the Blackwater River and Estuary (000072) pNHA. Apart from the inclusion of abandoned industrial lands south of Dunn's Park outfall, the boundaries of Blackwater River and Estuary pNHA are the same as those of Blackwater River (Cork/Waterford) SAC in the area adjoining the project / Dunn's Park. There is no direct overlap with Blackwater River and Estuary (000072) pNHA. There will be no loss of habitat within the pNHA. Furthermore, as there will be no vegetation clearance, demolition, construction or decommissioning phases to the project there will be no direct or indirect negative construction effects to Blackwater River and Estuary pNHA.

Ballyvergan Marsh pNHA (000078) is located ca. 2.55km south of the project. There will be no direct effects to this pNHA; furthermore, as there will be no vegetation clearance, demolition, construction or decommissioning phases to the project there will be no negative construction effects to Ballyvergan Marsh pNHA or indeed to any other pNHA's in the wider environment (as described in Section 10.3.1.1).

There will be no direct effects to any sites designated for ecological importance, including site designated as being of National Importance (as set out in section 10.3.1.1).

10.4.1.2. Flora & Fauna

Physical damage can include the degradation to, modification, fragmentation, or direct loss of habitats. Direct physical damage of habitats can occur within working areas of the project, site compounds, temporary works etc. Physical damage of habitats can also be an indirect effect. Physical damage may be temporary or permanent in nature. As per the EPA Guidelines (EPA, 2022) the level of effect is informed by the ecological value of those ecological features (e.g. habitats) recorded on site; their sensitivity to direct or indirect construction impacts; viewed in the context of the type, scale (magnitude) and duration of a potential effect. Within the red-line boundary none of the semi-natural habitats recorded were of more than local ecological value (see Section 10.3.2). Habitats within the adjoining SAC and SPA are of international ecological value (NPWS, 2012; UÉ, 2023). In the absence of any vegetation removal, demolition, construction, or decommissioning phases there will be no negative effects to any of the terrestrial semi-natural habitats noted above, nor to fauna using these habitats. There will also be no negative effects on plant species associated with these habitats.

As noted no rare or protected plant species were noted within the project area. There will be no negative effects arising from this project to rare or protected flora.

10.4.1.3. Disturbance

Disturbance can cause sensitive species to deviate from their normal and preferred behaviour, resulting in stress and increased energy expenditure. Disturbance can result in species being displaced from suitable habitat areas that provide areas for feeding and foraging, commuting routes, and resting and breeding sites. Physical disturbance of species can also result in direct mortalities of species and thus, disturbance effect can be both direct and indirect and may be temporary or permanent in nature. Examples of direct disturbance includes activities such as damage to a breeding or resting site of a protected species, e.g. a bat roost, badger sett or otter holt. Indirect disturbance may result from the presence of works crews and personnel on site during

construction, noise emanating from a construction site or artificial lighting of a bat foraging area, causing bats to avoid the area.

As noted above, in the absence of any vegetation removal, demolition, construction, or decommissioning phases there will be no disturbance on site construction activities and therefore no disturbance related negative effects to any protected or rare flora or fauna associated with project.

10.4.1.4. Changes in Water Quality

The release of pollutants to water during construction can impact upon the relevant waterbodies and the species they support. This can for example result in effects such as increased turbidity of the water column, a reduction in photosynthesis, contribution to eutrophication and changes to the species composition of the system. The degree of impact depends on the type of pollutant released and the nature and sensitivity of the receiving receptor. For example, the release of fine sediments to a stream or river is likely to cause siltation of the river bed and interrupt the functioning of species, from aquatic plants to macroinvertebrates to fish, and larger predators that depend on these biotic groups as a food supply (e.g. otter and kingfisher). Impacts to water quality could be temporary in the form of surface water runoff during construction, or permanent in the form of a continued discharge impacting negatively on the receiving environment during the operation of the project.

As noted there are no watercourses within the project site noted on the EPA mapviewer. Nearby waterbodies include a number of drains crossed by the access road to the WwTP, which are connected to the coastal lagoon inside the sea wall, and ultimately to the estuary which is designated as an SAC, SPA and pNHA. This is discussed in detail in the accompanying NIS (UÉ, 2023).

As there are no physical changes occurring with Dunn's Park discharge outfall and there are no changes required to the existing infrastructure to facilitate the project, no construction related effects to water quality are predicted.

10.4.1.5. Dispersal of Invasive Species

Non-native invasive species can have negative effects on biodiversity. Negative effects of non-native invasive species on native biota occur through competition, predation, herbivory, habitat alteration, disease and genetic effects such as hybridisation. In the cases of non-native invasive species such as Japanese knotweed, the main effects are a reduction in species diversity due to dense plant growth, heavy shading and disruption of trophic levels. These species can potentially be spread via plant fragments and soil containing plant material, and by vectors such as machinery and personnel. Strict biosecurity measures are therefore required on any site to prevent the introduction or spread of invasive plant species. The level of risk and control measures required will be informed by the invasive species found to be present on a site.

New Zealand Pigmyweed (*Crassula helmsii*) has been recorded from a drain adjoining the access road to the WwTP. This is listed in the 3rd Schedule of the Natural Habitats Regulations, 2011 (S.I. 477 of 2011); i.e. species to which Regulations 49 & 50 apply. There is no evidence of Japanese knotweed which was previously recorded at Dunn's Park PS.

In the absence of any vegetation clearance demolition, construction, or decommissioning phases there will be no negative effects arising from the introduction or spread of invasive species.

10.4.2. Operational Effects

The operational phase of the project will involve continued operation of the Dunn's Park discharge as a permanent outfall from Youghal's WwTP. There are no changes to existing operational plant items, buildings, or operational hours within the existing WwTP, hence no changes to the operational phase of the WwTP. There will also be no changes Dunn's Park discharge outfall pipe.

There will be no emissions or discharges to the terrestrial environment.

There will also be no operational alterations along the ring road or to the environs of Dunn's Park needed to facilitate ongoing use of the Dunn's Park outfall (refer to Figure 2-1 for the Youghal Agglomeration Boundary; refer to Figure 2-2 for the outline of Dunn's Park discharge outfall) .

Therefore, as there are no physical changes occurring with Dunn's Park discharge outfall and there are no changes required to the existing infrastructure to facilitate the project, no operational related effects to terrestrial biodiversity are predicted.

The potential impacts associated with WwTP discharges is related to Biological Oxygen Demand (BOD), nutrient and bacteriological loading. A model of the discharge based on these parameters was carried out by AECOM on behalf of Uisce Éireann. The model found that the discharge would not adversely impact on the WFD status, bathing water quality or aquaculture sites within Youghal Harbour or Youghal Bay. As such there will be no impact on marine mammals or on estuarine habitats as there is no impact on water quality (see Chapter 11.0 - Water Quality Chapter). Furthermore, the NIS concluded that "*the modelling undertaken (AECOM 2020 and 2023) demonstrates that the existing level of treatment at Youghal WwTP and the existing primary discharge location*

at Dunn's Park are sufficient to support the achievement of WFD objectives for receiving waters under current and future loading scenarios". Refer to Appendix 11.1. and 11.2 for the AECOM reports.

10.5. Mitigation Measures

No mitigation measures for terrestrial ecology are required.

10.6. Residual Effects

EPA (2022) define residual effects as "*The degree of environmental change that will occur after the proposed mitigation measures have taken effect*".

However, as noted no construction or operational effects to terrestrial biodiversity are predicted to arise from the project. No mitigation measures are proposed.

10.7. Do-Nothing

As noted, there are no physical changes occurring with Dunn's Park discharge outfall and there are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur (this is described in full in Section 2 of this EIAR). In the absence of the project, the site of the WwTP, Dunn's Park outfall, the access road and the public landscaped environs of the road are likely to be managed in the same way as at present. Apart from further maturation of landscape trees little change in terrestrial habitats is therefore envisaged in the short to medium term.

10.8. Monitoring Requirements

No monitoring of terrestrial ecology / biodiversity is required.

10.9. Cumulative Effects

Potential cumulative effects, defined as '*the addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects'* (EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports, 2022) have been considered within the biodiversity chapter. The potential for such effects with respect to Biodiversity are expanded on in Section 13.3.8 of the EIAR.

It is concluded that no residual effect to terrestrial ecology / biodiversity are predicted to result from the use of the Dunn's Park discharge outfall on a permanent basis. In the absence of any such impacts, no significant cumulative effects to terrestrial ecology / biodiversity are predicted to occur.

10.10. Difficulties encountered

No difficulties were encountered during the preparation of this assessment.

11. Water

11.1. Introduction

The water chapter was prepared by Deirdre Larkin a Technical Director with Atkins and has 20 years experience in Geology, Hydrogeology, Hydrology and Human Health Risk Assessment. Deirdre holds a BSc. Geology and MSc in Applied Hydrogeology. Deirdre is a chartered member of The Institute of Geologists of Ireland (IGI PGeo No. 223; EurGeol No 1064).

This chapter describes the existing surface water and groundwater regime likely to be encountered beneath and in the general vicinity of the project. It also addresses the potential impact of the project on hydrology (i.e. surface water) and hydrogeology (i.e. groundwater) together with any mitigation measures that may be employed to eliminate or reduce any potential impacts.

UÉ are seeking to authorise the use of the Dunn's Park discharge outfall as the primary outfall for Youghal WwTP, on a permanent basis. A detailed description of the project (hereafter referred to as the project / site) is presented in Chapter 2 – Project Description of the EIAR.

For the purpose of this impact assessment the study area comprises the current site (i.e. the boundary of Youghal WwTP including the extent of Dunn's Park discharge outfall), and where required, the approximate extent of the Youghal agglomeration. Refer to Figure 11.1.

11.2. Study Assessment and Methodology

The following desk-based scope of works was undertaken by Atkins in order to complete this assessment: -

- Review of available relevant information for the site and surrounding environment; and,
- Review of available relevant site specific assessments / reports including the Marine Modelling Study Addendum report (AECOM, 2023) and Natura Impact Statement (Uisce Eireann, 2023).

The purpose of the desk-based task is to characterise the current hydrological and hydrogeological setting of the project . Relevant background information was compiled, specifically from the following data sources;

- Bing Maps Aerial photography (consulted 01/06/23);
- Cork County Development Plan 2022-2028 (consulted 31/05/23);
- Environmental Protection Agency (EPA) web mapping (consulted 01/06/2023);
- Geological Survey of Ireland (GSI) Datasets Public Viewer and Groundwater web mapping (consulted 02/06/23);
- Google Maps Aerial photography (consulted 01/06/23);
- Ordinance Survey of Ireland (OSI) web mapping (consulted 01/06/23);
- Topographic-map.com (consulted 31/05/2023);
- Water Framework Directive (WFD) Ireland web mapping (consulted 02/06/23); and,
- EDEN Monitoring Data Systems, consulted for National Water Monitoring Stations (data period 2016-2022).

This assessment has been completed in accordance with relevant best practice guidance from the Institute of Geologists of Ireland (IGI), '*Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements'* (IGI, 2013). The IGI guidance document is an updated version of the 2002 guidelines, '*Geology in Environmental Impact Statements, A Guide'* (IGI, 2002), which was revised to take account of legislative changes, and the operational experience developed by geoscientists in the production of relevant environmental assessments. This assessment has also been prepared in accordance with the relevant Environmental Protection Agency (EPA) guidance, '*Guidelines on the information to be contained in Environmental Impact Assessment Reports'* published in May 2022.

No difficulties were encountered during the preparation of this assessment.

11.2.1. Marine Modelling Study

A Youghal Wastewater Treatment Works Marine Modelling Study Addendum (2023) has been undertaken by AECOM with the overall aim of assessing the discharges of treated wastewater from the Youghal WwTP to the tidal River Blackwater (also referred to as the Lower Blackwater M Estuary). The purpose of this study is to report

on an assessment of the discharges from Wastewater Treatment Plants (WwTPs at Lismore, Cappoquin and Youghal) and Storm Water Overflows (SWOs), including emergency overflows, to the Lower Blackwater M Estuary / Youghal Harbour to support the EIAR. The potential impact from the UÉ discharge location at Dunn's Park has been evaluated at the design capacity of the Youghal WwTP and predicted growth rates for the other two WwTPs.

As part of the modelling study the following analyses have been completed, in accordance with UÉ Technical Standards:

- Unit Impact Assessment (UIA) for Escherichia coli (EC) and Intestinal Enterococci (IE); and,
- A flow-weighted mass-balance based nutrient impact calculation using EPA/OSPAR/RID data for the Lower Blackwater M Estuary / Youghal Harbour waterbody.

The UIA utilised the rainfall record for a 10-year period and simulated flows in the combined drainage and sewer networks for Lismore, Cappoquin and Youghal. The model of the Youghal estuary used for the previous study was utilised to simulate the fate of the bacteria over the 10-year period. The resulting percentile concentrations were then calculated at 15 locations close to sensitive receptors including designated bathing waters, designated shellfish waters, classified production areas and licensed aquaculture sites. At each location the bacteria count has been assessed against the Bathing Water Directive criteria for Escherichia coli (EC) and Intestinal Enterococci (IE) and the criteria agreed with the Environment Protection Agency (EPA) for the 97th percentile and geomean.

The flow weighted mass balance calculation for ammonia, BOD (Biological Oxygen Demand), ortho-P (orthophosphate) and DIN (Dissolved Inorganic Nitrogen) has been undertaken for a seven year period (2016 to 2022). Water quality data was obtained from the EPA monitoring database. River flows were estimated based on observed river water levels converted to flow rates for the rivers Blackwater and Bride. Minor tributaries have used scaled river flows based on Hydrotool flow rates.

A copy of the Marine Modelling Study Addendum is presented in Appendix 11.1. Further details of the assessment and modelling methodology used can be found in this report (AECOM, 2023). A full copy of all reports (AECOM, 2019 – 2020) for the various phases of the modelling process are also available in Appendix 11, as follows:

- Appendix 11.2 AECOM (2020) Youghal Marine Modelling Study Modelling Report;
- Appendix 11.3 AECOM (2019) Youghal Wastewater Treatment Works Model Scoping Report;
- Appendix 11.4 AECOM (2020) Youghal Wastewater Treatment Works Survey Interpretive Report; and,
- Appendix 11.5 AECOM (2020) Youghal Marine Modelling Study Model Calibration Report.

11.3. Receiving Environment

11.3.1. Site Development

A review of historic maps (including available 6-inch historic maps, 25-inch historic maps, and aerial photographs (1995 to 2018) from the Ordnance Survey of Ireland (OSI, 2023) and current aerial photography (Bing Maps, 2023 shows that the Youghal WwTP has been operational since 2019. Historically the area is known as the Youghal Mudlands and these lands appear to have been reclaimed during the late 19th century. The reclamation works included the construction of the sea wall ca. 350m west of the site. The sea wall runs in a southerly direction, separating the Youghal Mudlands from the Lower Blackwater Estuary (also referred to as Youghal Harbour). Refer to the following chapters of this EIAR for further details and associated figures depicting the historic development of the area:

- Chapter 6 - Land, Soils and Geology, and
- Chapter 8 - Cultural Heritage.

11.3.2. Current Site Setting and Topography

The site comprises the Youghal WwTP (operational from 2018), greenfield lands and the edge of Youghal estuary. The topography of the site ranges between 0m and 5m above ordnance datum (mOD). In general, the surrounding areas do not exceed the 10mOD (with occasional localised depressions noted to have an elevation of ca. -4mOD) (OSI, 2023)[37].

The site is generally bounded by greenfield lands, used primarily for grazing, and is immediately bounded by:

[37] https://webapps.geohive.ie/mapviewer/index.html

- Muckridge Stream, which wraps around the western and northern boundaries of the site. The steam connects to the northern field drain running along the northern site boundary; and,
- Minor field drain, located 15m south of the southern border of the site.

The nearest residential area is located 170m west to southwest of the site. The following features are also located within 0.5km of the site:

- Egans Funeral Directors – 300m northwest of site;
- Foxhole Industrial Estate – 470m directly north of site; and,
- Youghal Landfill – 427m north of site.

The nearest designated European Sites are as follows (EPA, 2023):

- Blackwater River (Cork / Waterford) SAC (Ref: 002170);
- Blackwater Estuary SPA (Ref: (004028); and,
- Blackwater River and Estuary pNHA (Ref: 000072).

Dunn's Park discharge outfalls into the Blackwater River and Estuary, and directly into the above designated European Sites.

11.3.2.1. Potential Contamination Sources

On a regional scale there are 3no. EPA licenced facilities within 5km of the Site (refer to Chapter 6 – Land, Soils and Geology for further details). Land use / activities within the Youghal WwTP itself and surrounding industrial lands would also be considered as potential contamination sources. The key potential offsite contamination source would be Youghal Landfill Facility (IE licence Ref: W0068-03) located ca. 427m north of the WwTP and ca. 1.5km north (and upstream) of Dunn's Park outfall pipe.

11.3.3. Flood Risk

Atkins (2023) completed a Stage 1 – Flood Risk Assessment. The following conclusions were drawn:

- *'There are no physical changes occurring.*
- *There is no historic risk of existing flooding at the site.*
- *In accordance with the OPW 'The Planning System and Flood Risk Management' guidelines, Section 5.28, such minor development that do not have any impact on flood risk or flow paths will not need a justification test. As there is no construction or demolition, a Stage 2 – Flood Risk Assessment is deemed not required'* (Atkins, 2023).

Stage 1 – Flood Risk Identification is concluded and a Stage 2 – Flood Risk Assessment is deemed not required.

Refer to Appendix 11.8 for the Atkins (2023) Stage 1 - Flood Risk Assessment.

11.4. Hydrology

The River Muckridge (EPA Ref: IE_SW_18M310560) flows through the northern region of the site into the Lower Blackwater M[38] Estuary/Youghal Harbour transitional waterbody (EPA Ref: IE_SW_020_0100), which flows into Youghal Bay coastal waterbody (EPA Ref: IE_SW_020_0000).

The East Ballyvergan (EPA Ref: IE_SW_19E040700) river is located ca. 200m south of the Youghal Agglomeration area (EPA, 2023). Refer to Figure 11.1 below. Key hydrological features in the general vicinity of the site are presented in the figure below. The East Ballyvergan river discharges into Youghal Harbour ca. 550m south west of the Youghal Agglomeration area.

[38] M denotes Munster

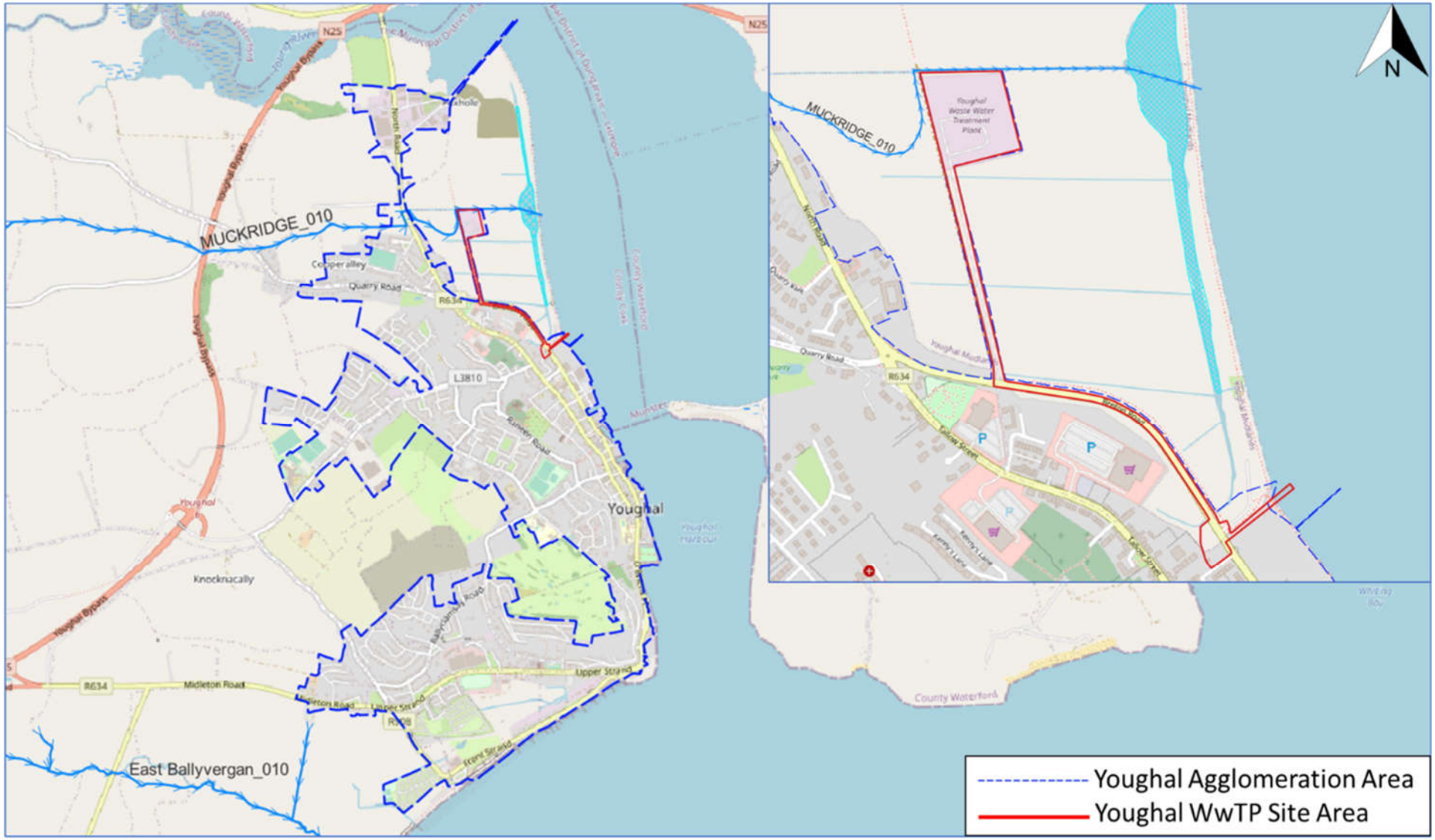


Figure 11.1 - Hydrological Setting Youghal WwTP

There are no audited geological heritage sites within 500m of the site but there is 1no. unaudited heritage site situated ca. 1.7km south of Dunn's Park discharge outfall. The geological heritage area is named "Youghal (under lighthouse)" and has been assigned a County Geological Site (CGS) designation (GSI, 2023).The closest audited geological heritage site is Whiting Bay and Goat Island (WD055), located ca. 3.2km east of the site. This geological heritage site is described by the GSI (2023) as '*Coastal cliffs, beach and foreshore, displaying a variety of rocks and glacial sediments'.*

11.4.1. Surface Water Quality

The EPA maintains a database of surface water features including rivers and lakes as well as water quality and risk status in accordance with the requirements of the EU Water Framework Directive (2000/60/EC) (WFD). The purpose of the WFD is to protect and improve water quality in all waters (including rivers, lakes, estuaries, coastal waters and groundwater). This involves improving or maintaining current water quality status with the aim of achieving '*Good'* ecological status for all waters by 2027; and mitigating against the risk of a decline in the water body quality status.

The area is located within the Blackwater (Munster 18) catchment area. Refer to Figure 11.2. This catchment is further broken down into sub catchments, the site is located within a sub-catchment (WFD ref: Tourig_SC_010 WFD) of the Lee, Cork Harbour and Youghal Bay WFD catchment.

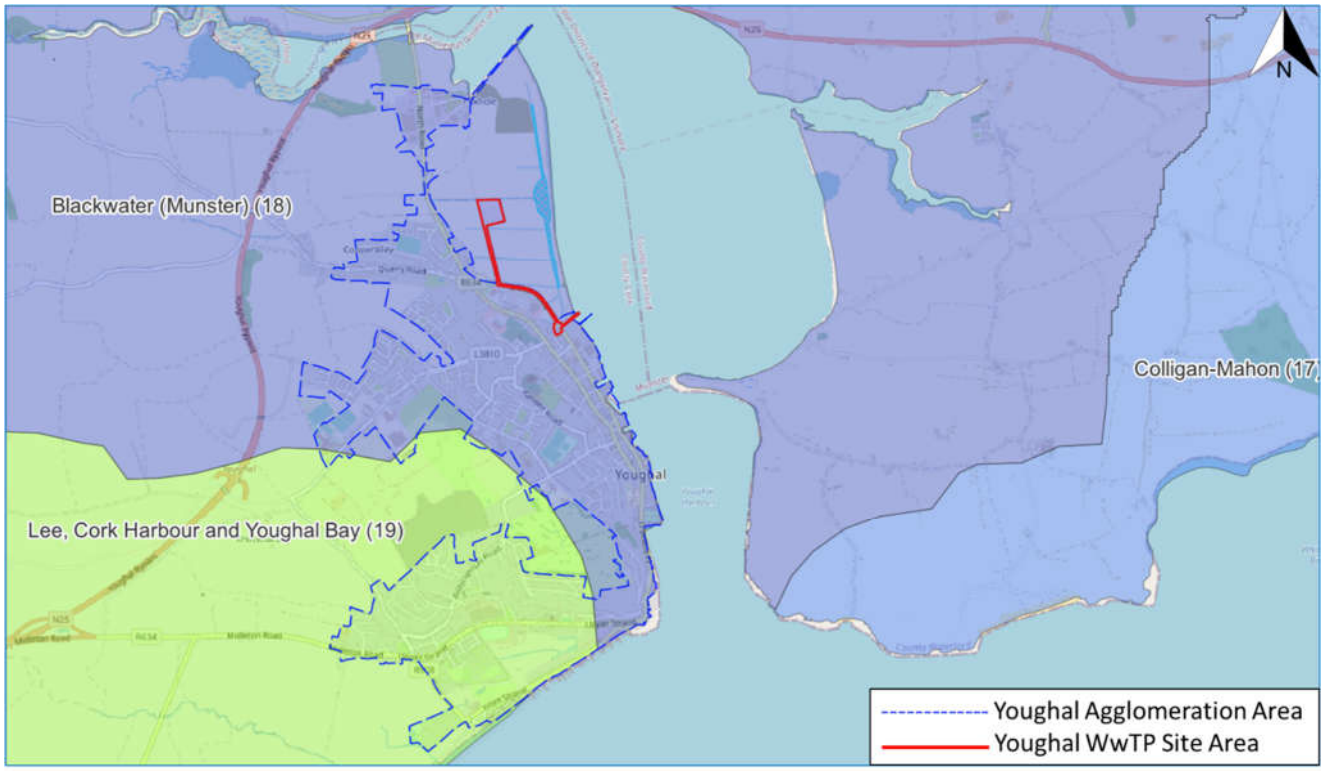


Figure 11.2 - Youghal Surface Water WFD Catchments (EPA, 2023)

The Youghal Agglomeration Area is within Blackwater (Munster 18) catchment and Lee, Cork Harbour and Youghal Bay (19) catchments, as presented in the figure above. This area is further categorized into two sub catchments (WFD ref: Tourig_SC_010(18_8); Womanagh_SC_010(19_16)), as presented in the figure below.

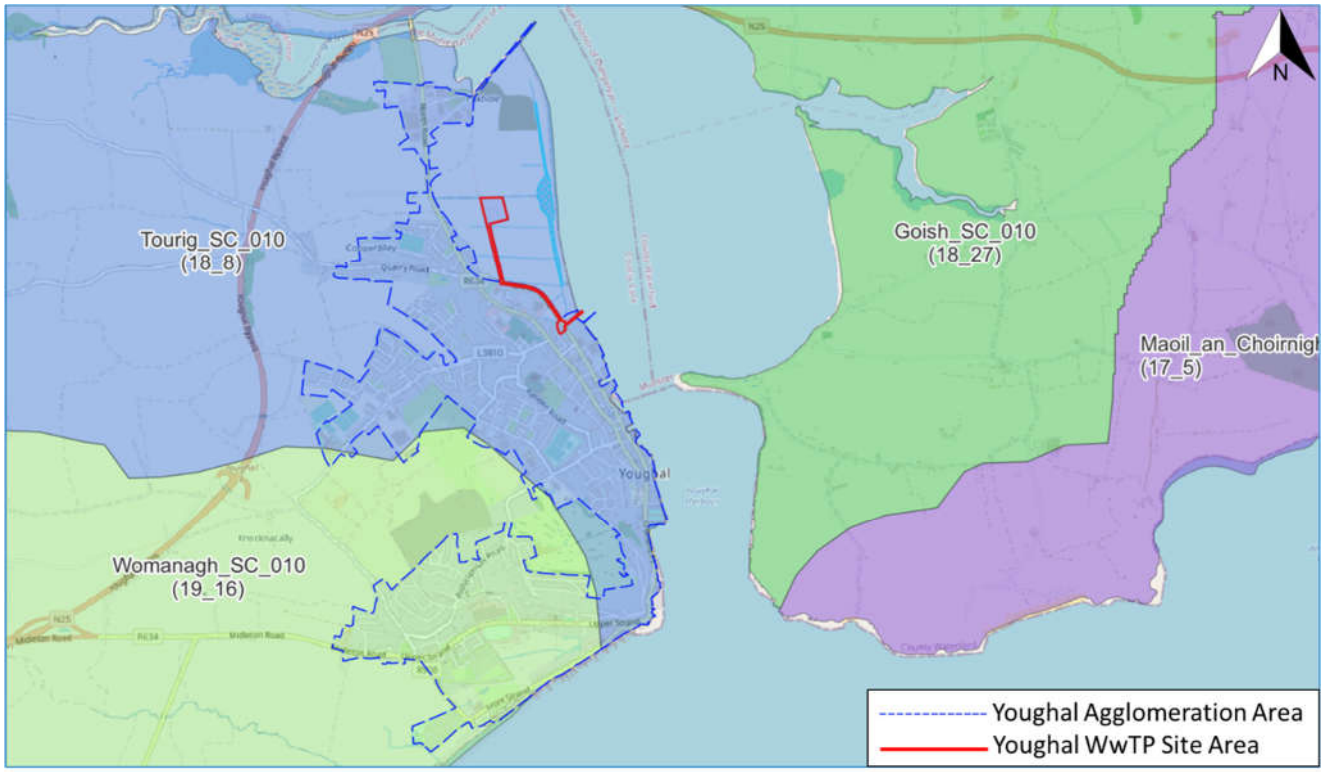


Figure 11.3 - Youghal Surface Water WFD Sub catchments (EPA, 2023)

WFD Water Quality Status (2016 – 2021)

The River Muckridge has been assigned *'moderate'* river water quality status by the EPA for the 2016 to 2021 monitoring period, while the status of the East Ballyvergan river is assigned as '*good'* for the same monitoring period (EPA, 2023). Refer to the figure below.

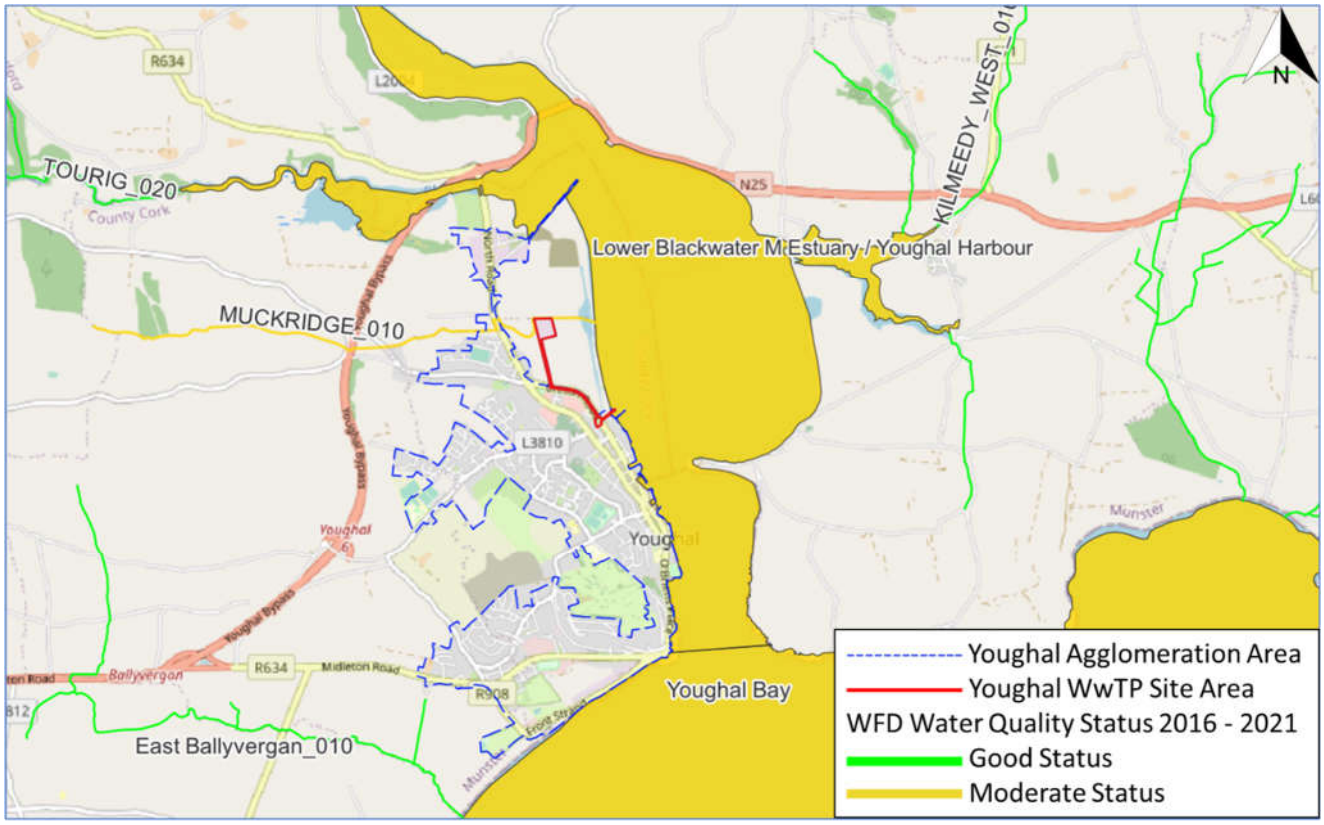


Figure 11.4 - WFD Water Quality Status (2016-2021)- Rivers, Transitional and Coastal Waters (EPA, 2023)

The River Muckridge discharges to the Lower Blackwater M [Munster] Estuary/Youghal Harbour transitional waterbody which runs along the eastern edge of the site. The Lower Blackwater M Estuary/Youghal Harbour waterbody is classified as having '*moderate'* transitional waterbody status by the EPA for the 2016 to 2021 monitoring period (EPA, 2023). The Youghal Bay (IE_SW_020_0000) is a coastal waterbody south of site and has been assigned *'moderate'* water quality status for the 2016 to 2021 period (EPA, 2023). Refer to the above figure.

WFD Water Quality Status Risk (3rd Cycle)

Both the Lower Blackwater M Estuary (ref: IE_SW_020_0100) transitional waterbody, and the Youghal Bay (ref: IE_SW_020_0000) coastal waterbody are considered to be *'At Risk'* of failing to meet the relevant WFD objectives by 2027.

Both the River Muckridge and East Ballyvergan river are currently under *'Review'* with regards to meeting the relevant WFD objectives by 2027.

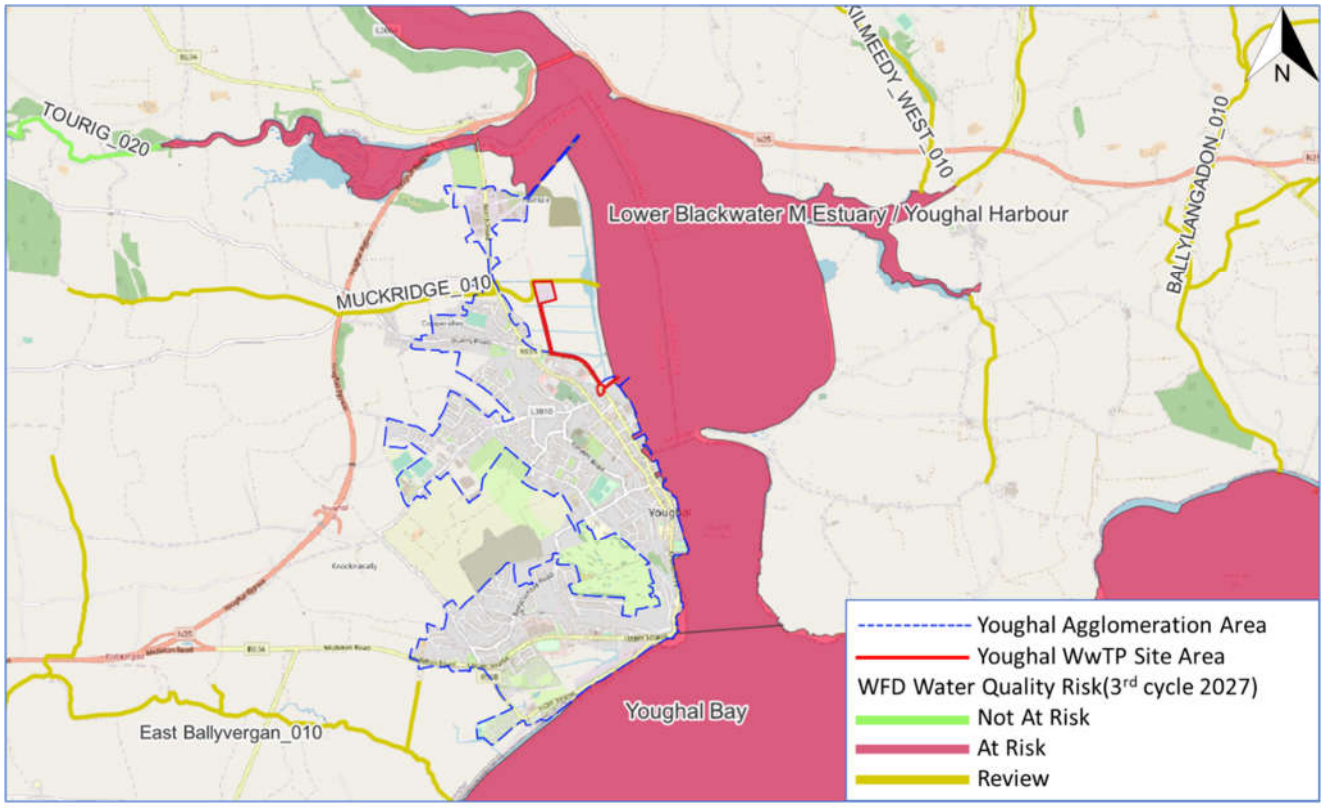


Figure 11.5 - WFD Water Quality Risk Status (3rd cycle) - Rivers, Transitional and Coastal Waters (EPA, 2023)

Surface Water Quality Monitoring

The EPA maintains a record of locations and water quality values collected for the National Water Monitoring by the EPA and Local Authorities. Locations are categorised by waterbody type – river, transitional and coastal waterbodies. The locations of the National Water Monitoring Stations in the vicinity of the site are shown in the figure below. The following 2no. monitoring locations are considered to be most relevant to this assessment:

- **EPA Monitoring Station: TW31003144BR2012** – located upstream of Dunn's Park discharge point; and,
- **EPA Monitoring Station: TW31003144BR2013** - located downstream of Dunn's Park discharge point.

A review of available surface water quality data has been undertaken for both of these sample locations. A copy of all relevant supporting analytical data is presented in Appendix 11.6 and Appendix 11.7 respectively.

Figure 11.6 - National Water Monitoring Stations in the vicinity of Youghal WwTP Site (EPA, 2023)

Lower Blackwater M Estuary / Youghal Harbour (TW31003144BR2012)

The Lower Blackwater M Estuary station is also referred to as BR220 - d/s Old Bridge / Youghal Landfill station. It is located ca. 850m north (and upstream) of the Dunn's Park discharge point. Water monitoring at this location is managed by Waterford City and County Council (WCC). According to the EPA, monitoring has been undertaken here since 2016, with varying frequency. Typically, a winter and a summer water sample are taken to account for seasonal variation.

For the purposes of this baseline assessment a review of key indicator surface water parameters, Ammonia, BOD and Orthophosphate, for a six year period (2016 – 2022) has been undertaken. The selected monitoring period includes three years pre-operation, and three years during the operational phase of the Youghal WWTP.

Annual trends in concentrations for Ammonia, BOD and Orthophosphate between 2016 and 2022 are presented in the graphs below. The data also shows the minimum, maximum and average annual values for each parameter. Refer to Appendix 11.6.

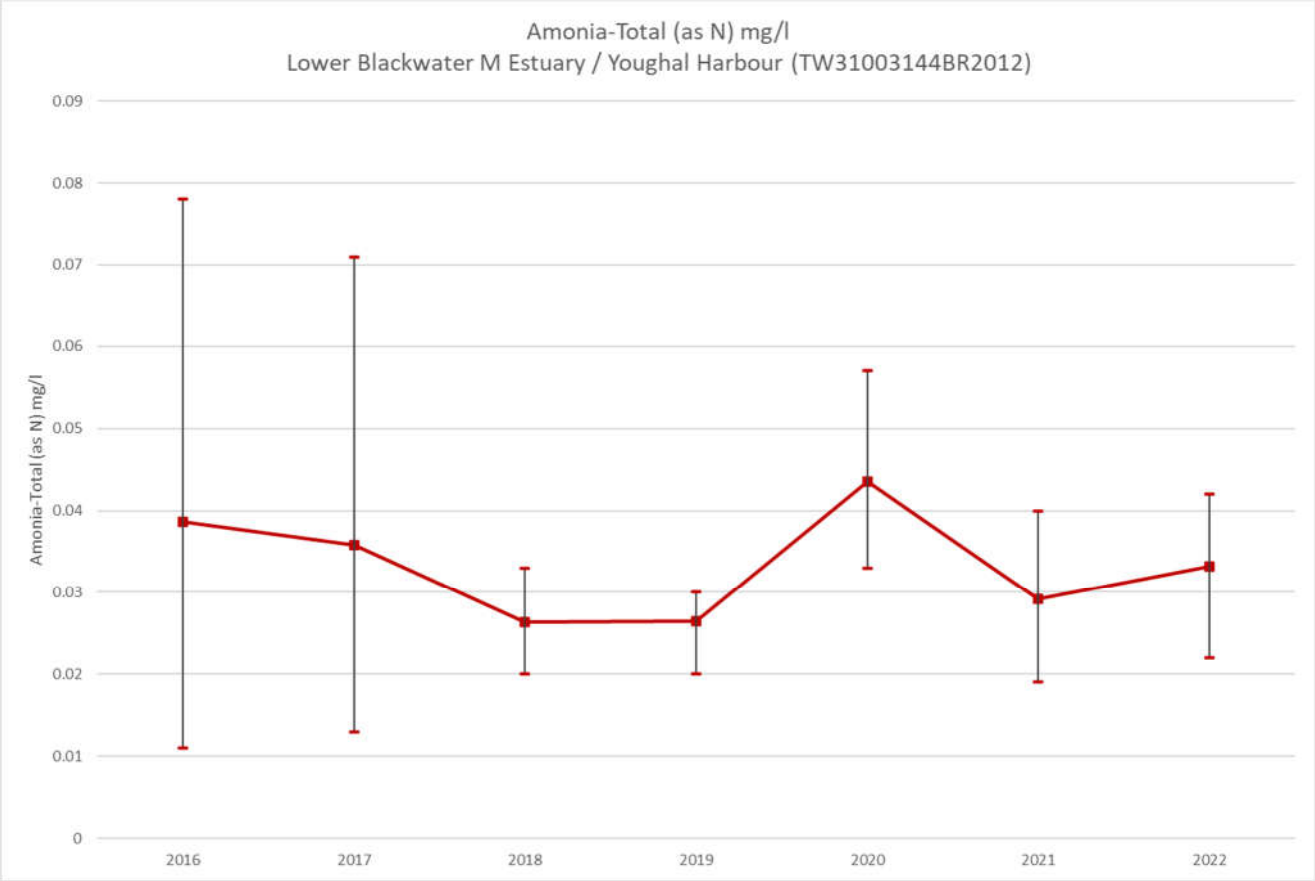


Figure 11.7 – Average Annual Ammonia Concentrations BR220 - Old Bridge Station

Figure 11.8 – Average Annual BOD Concentrations BR220 - Old Bridge Station (note relevant surface water regulation values are also presented)

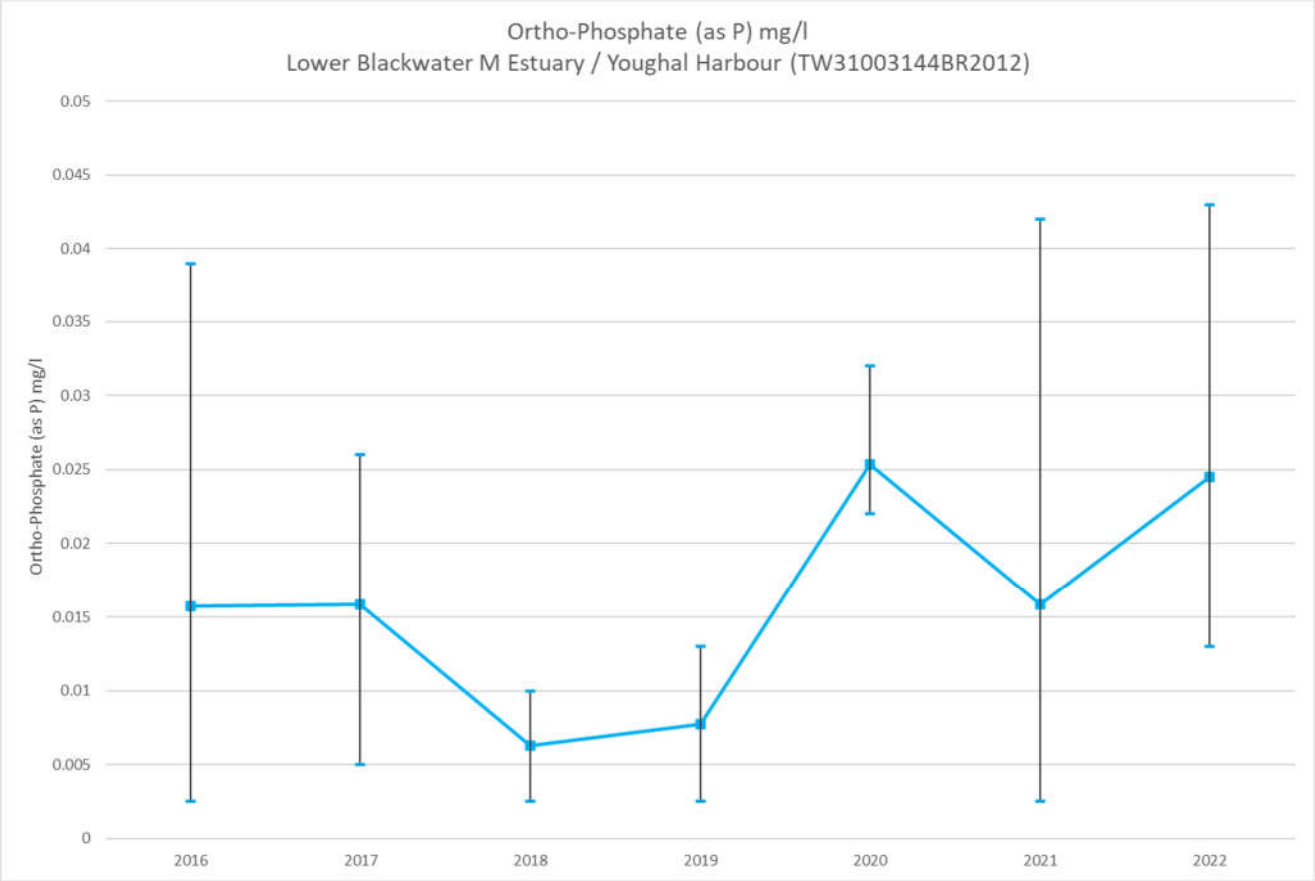


Figure 11.9 – Average Annual Ortho-Phosphate Concentrations BR220 - Old Bridge Station

Accounting for seasonal changes and natural variation of the water quality of the Youghal Bay transitional waters, no significant effects on receiving water quality at the upstream monitoring location, with respect to Ammonia and BOD, are observed as a result of the ongoing operation of Youghal WwTP with associated discharge via. Dunn's Park discharge point (which commenced in 2018).

It is noted that there is a general increasing, albeit fluctuating, trend in average annual ortho-phosphate (as P) concentrations at this monitoring location. However this monitoring point is located ca. 850m upstream of the Dunn's Park discharge outfall, and downstream of the Youghal Landfill. Based on the findings from a report prepared by Fehily Timoney and Co. (2015) entitled '*Hydrological Review/Technical Assessment Report On Youghal Landfill For The Environmental Protection Agency'*, a groundwater ortho-phosphate (as P) concentration of 0.089 mg/l was reported at MW4 (located within the landfill site and adjacent to Youghal Harbour) in 2011. The report also states that '*as the waste is broken down over time a low residual flow rate of leachate is likely to remain for years to come. Therefore, the groundwater below the unlined section of the landfill is at risk of being polluted from residual leachate'* (Fehily Timoney and Co., 2015). Groundwater beneath the Youghal landfill discharges to the receiving transitional waters of Youghal Harbour.

It is therefore considered that the source of the increasing, albeit fluctuating, trend in average annual ortho-phosphate (as P) at the Old Bridge Station within Youghal Harbour, is likely to be the Youghal landfill. Furthermore, the location of this monitoring point, ca. 850m upstream of Dunn's Park discharge outfall, suggests that the source of the increasing, albeit fluctuating, trend in average annual ortho-phosphate (as P) is unlikely to be Dunn's Park discharge.

Lower Blackwater M Estuary / Youghal Bay (TW31003144BR2013)

The Lower Blackwater M Estuary -Bay station is also referred to as BR230 - Coastguard station. It is located ca. 1200m south (and downstream) of the Dunn's Park discharge point. Water monitoring at this location is also managed by Waterford City and County Council. According to the EPA, monitoring at this location has been undertaken since 2016, with varying frequency. Typically, a winter and a summer water sample are taken to account for seasonal variation.

Annual trends in concentration for Ammonia, BOD and Orthophosphate between 2016 and 2022 are presented in the graphs below. The data also shows the minimum, maximum and average annual values for each parameter. Refer to Appendix 11.7.

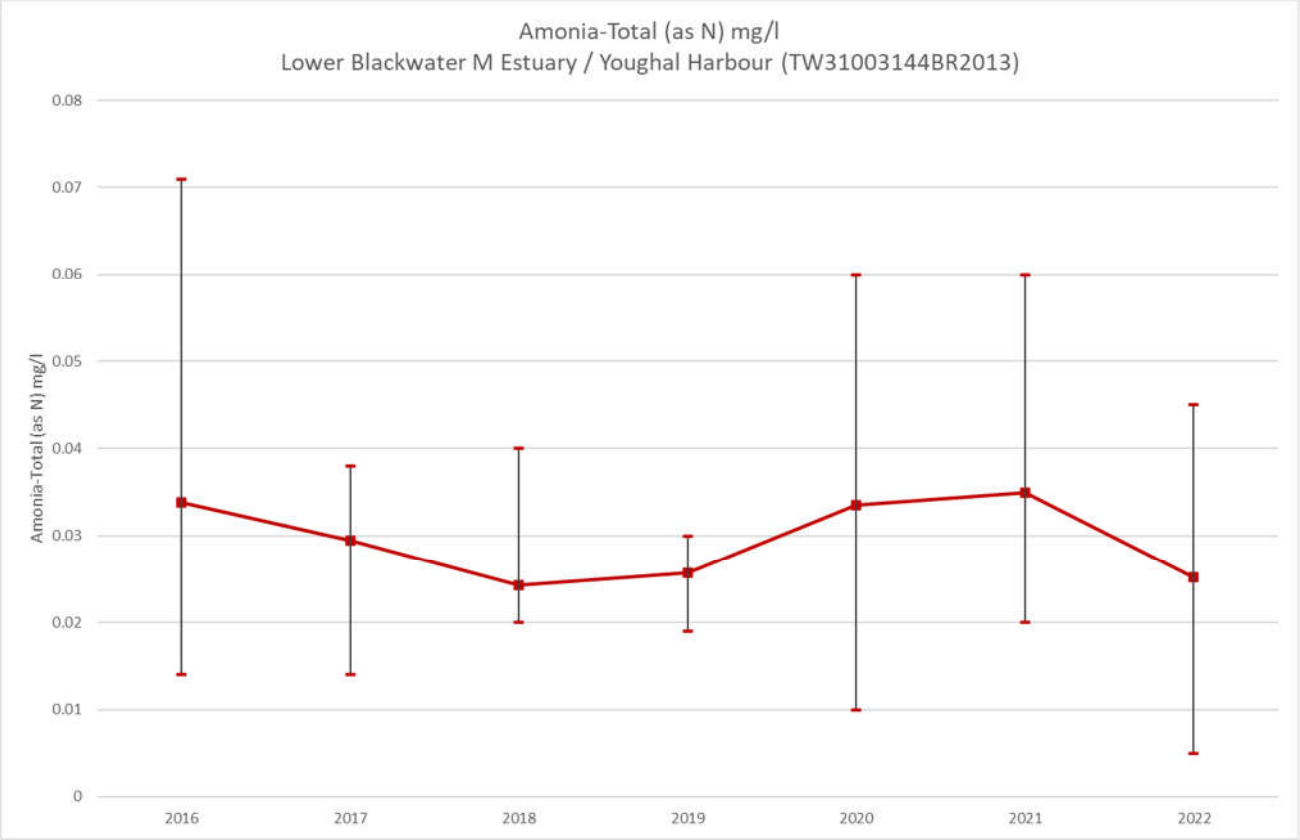


Figure 11.10 – Average Annual Ammonia Concentrations BR230 - Coastguard Station

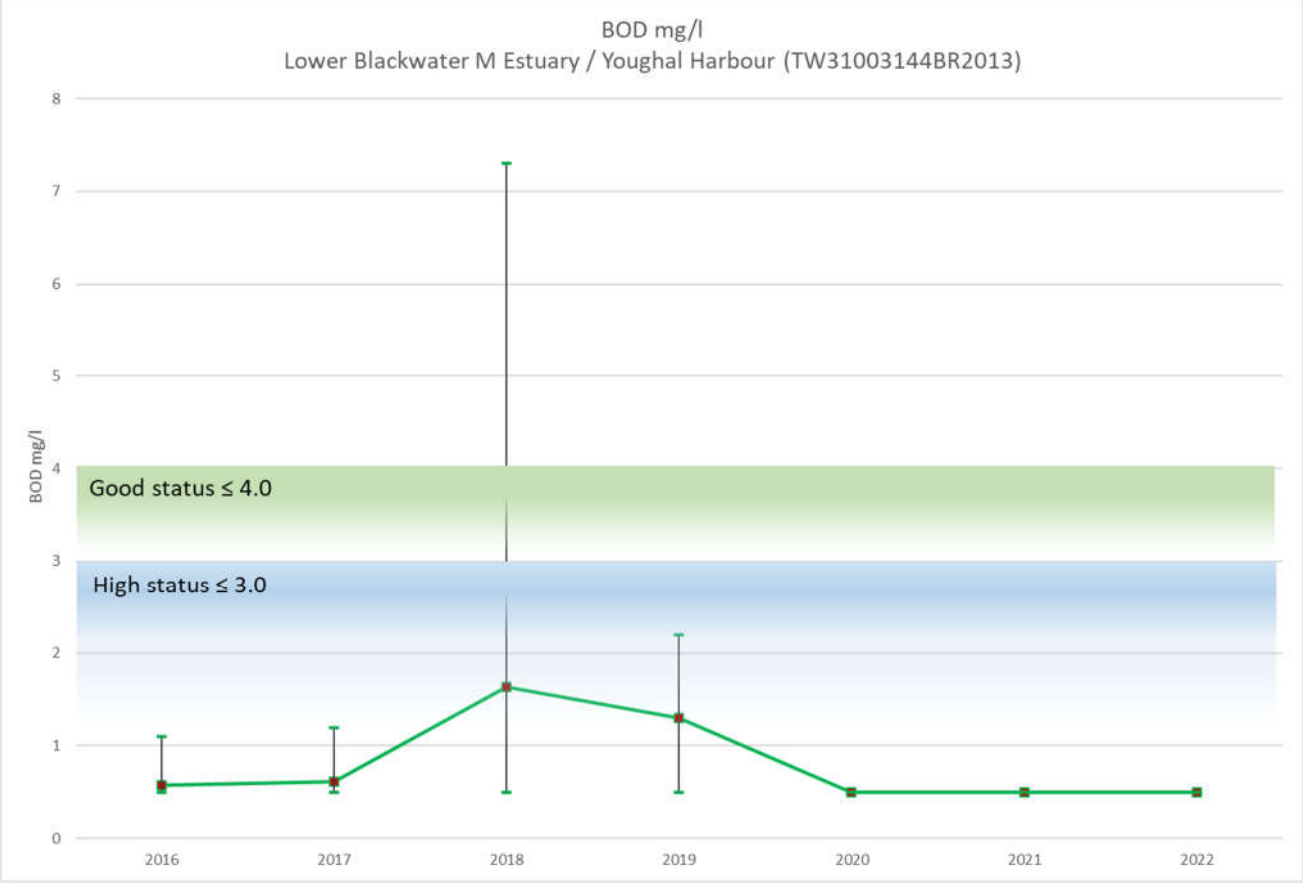


Figure 11.11 – Average Annual BOD Concentrations BR230 - Coastguard Station (note relevant surface water regulation values are also presented)

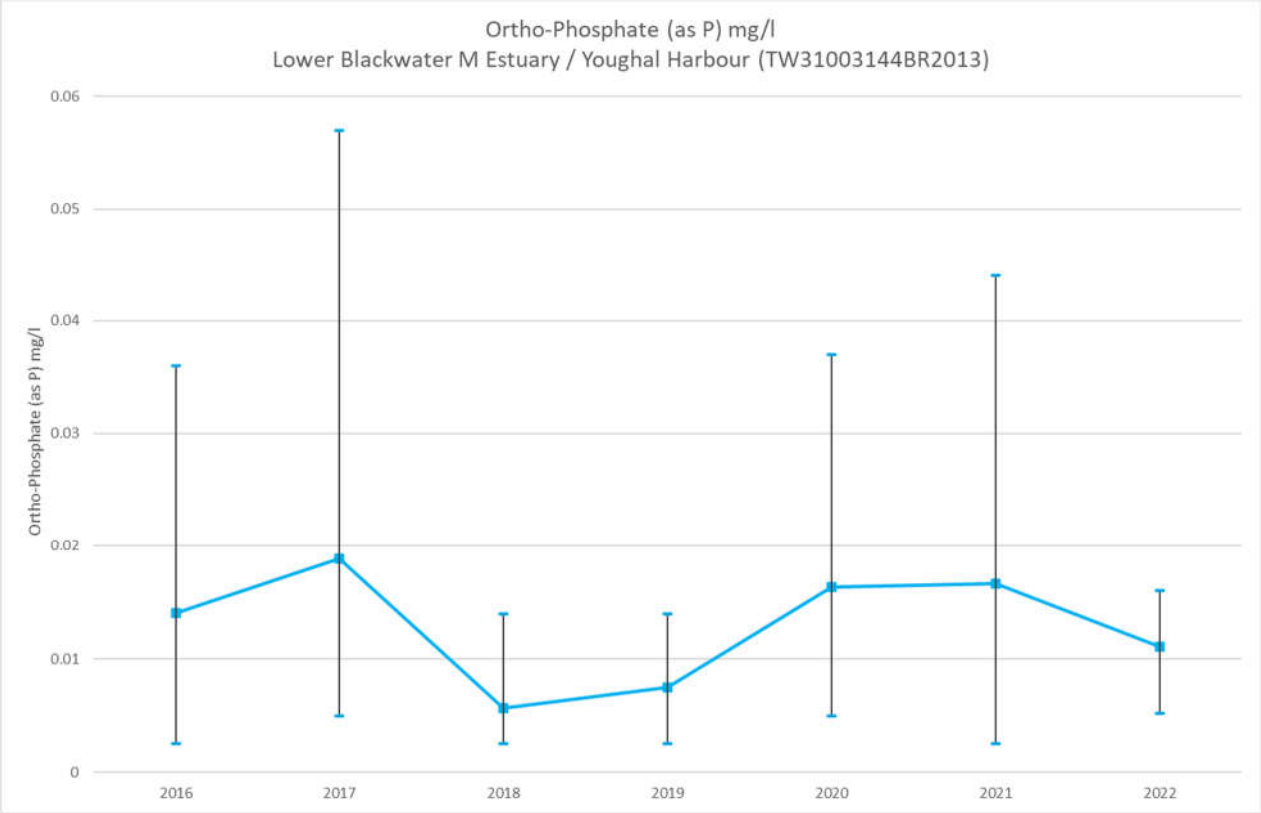


Figure 11.12 – Average Annual Ortho-Phosphate Concentrations BR230 - Coastguard Station

Accounting for seasonal changes and natural variation of the water quality of the Youghal Bay transitional waters, no significant effects on receiving water quality at the downstream monitoring location, with respect to Ammonia, BOD and Orthophosphate (as P), are observed as a result of the ongoing operation of Youghal WwTP with associated discharge via. Dunn's Park discharge point (which commenced in 2018).

Based on the examined parameters, there is no observed net negative effect on baseline water quality downstream of Dunn's Park discharge point, since the WwTP commenced operations in 2018 throughout the monitoring period to 2022.

11.4.2. EPA Register of Protected Areas

The EPA maintains a WFD Register of Protected Areas within Ireland. With respect to the location of the project, the following protected areas have been considered (and are presented in the figure below):

- Drinking Waters - S.I. No. 278/2007 - European Communities (Drinking Water) (No. 2) Regulations 2007:
    - River Glandine (Balckwater_010) (Ref: IE_SW_18G070300) protected under Article 7 Abstraction for Drinking Water; Located 3.7km north of the Youghal WwTP.
    - River Tourig (Tourig_020) (Ref: IE_SW_18T030700) protected under Article 7 Abstraction for Drinking Water; Located 3.1km north west of the Youghal WwTP.
- Bathing Water - S.I. No. 79/2008 - Bathing Water Quality Regulations 2008 and S.I. No. 351/2011 - Bathing Water Quality (Amendment) Regulations 2011.
    - Youghal Front Strand Beach (Ref: IESWBWC020_0000_0300); bordering Youghal Agglomeration.
    - Youghal Claycastle (Ref: IESWBWC020_0000_0200); bordering Youghal Agglomeration.
    - Redbarn (Ref: IESWBWC020_0000_0100); 1km south of the Youghal Agglomeration.
- Shellfish - S.I. No. 464/2009 - European Communities (Quality of Shellfish Waters) (Amendment) (No. 2) Regulations 2009:
    - Ballymacoda Bay (Ref: IE_SW_020_0000) located ca. 6.5km south west of Youghal WwTP;
- Nutrient Sensitive Areas in accordance with the Urban Waste Water Treatment (UWWT) Directive 91/271/EEC on Urban Waste Water Treatment and S.I. 254 / 2001, S.I. 440/2004 and S.I. 48/2010:
    - Lower Blackwater M Estuary / Youghal Harbour (Ref: IE_SW_020_0100)

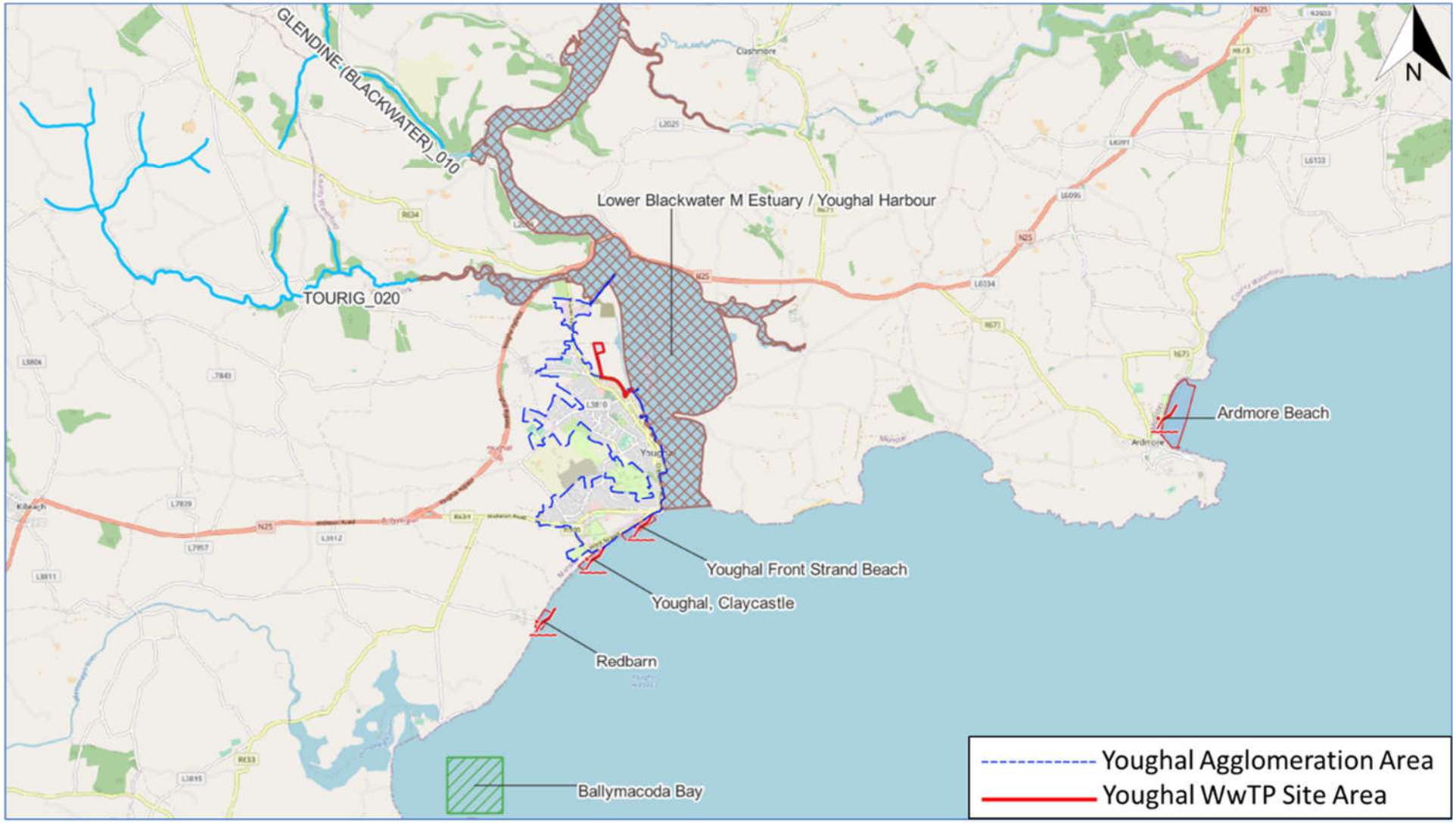


Figure 11.13 - EPA Register of Protected Areas (2023)

11.5. Hydrogeology

11.5.1. Aquifer Characteristics

The GSI provides a methodology for aquifer classification based on resource value (regionally important, locally important and poor) and vulnerability (extreme, high, moderate or low). Resource value refers to the scale and production potential of the aquifer whilst vulnerability refers to the ease with which groundwater may be contaminated by human activities (vulnerability classification is primarily based on the permeability and thickness of subsoils), as presented in table below.

Table 11-1 - GSI Vulnerability Classification Table

Vulnerability Rating	Hydrogeological Conditions				
	Subsoil Permeability (Type) and Thickness			Unsaturated Zone	Karst Features
	High permeability (sand/gravel)	Moderate permeability (e.g. Sandy subsoil)	Low permeability (e.g. Clayey subsoil, clay, peat)	(Sand/gravel aquifers only)	(<30 m radius)
Extreme (E)	0 - 3.0m	0 - 3.0m	0 - 3.0m	0 - 3.0m	-
High (H)	>3.0m	3.0 - 10.0m	3.0 - 5.0m	>3.0m	N/A
Moderate (M)	N/A	>10.0m	5.0 - 10.0m	N/A	N/A
Low (L)	N/A	N/A	>10.0m	N/A	N/A

Notes: (1) N/A = not applicable.
(2) Precise permeability values cannot be given at present.
(3) Release point of contaminants is assumed to be 1-2 m below ground surface.

Groundwater vulnerability is an indication of how easily the aquifer can become contaminated by human activity. It is dependent on the thickness and permeability of the overlying soils and depth to the water table. For example, a bedrock aquifer with minimal thickness of overburden or with a thin layer of permeable overburden will be more vulnerable to contamination than a bedrock aquifer which has a thick layer of low permeability overburden. Extreme groundwater vulnerability is also associated with karst landforms as these are a direct pathway for water and contaminants to enter the aquifer from the surface.

Groundwater vulnerability (in the bedrock aquifer) beneath the site ranges between '*High(H)'* to *'Moderate(M)*'. The vulnerability within the Youghal Agglomeration is predominantly '*High(H)'* to *'Extreme(E)*' with some areas of *'Rock at or Near Surface'*, as presented in the figure below (GSI, 2023).

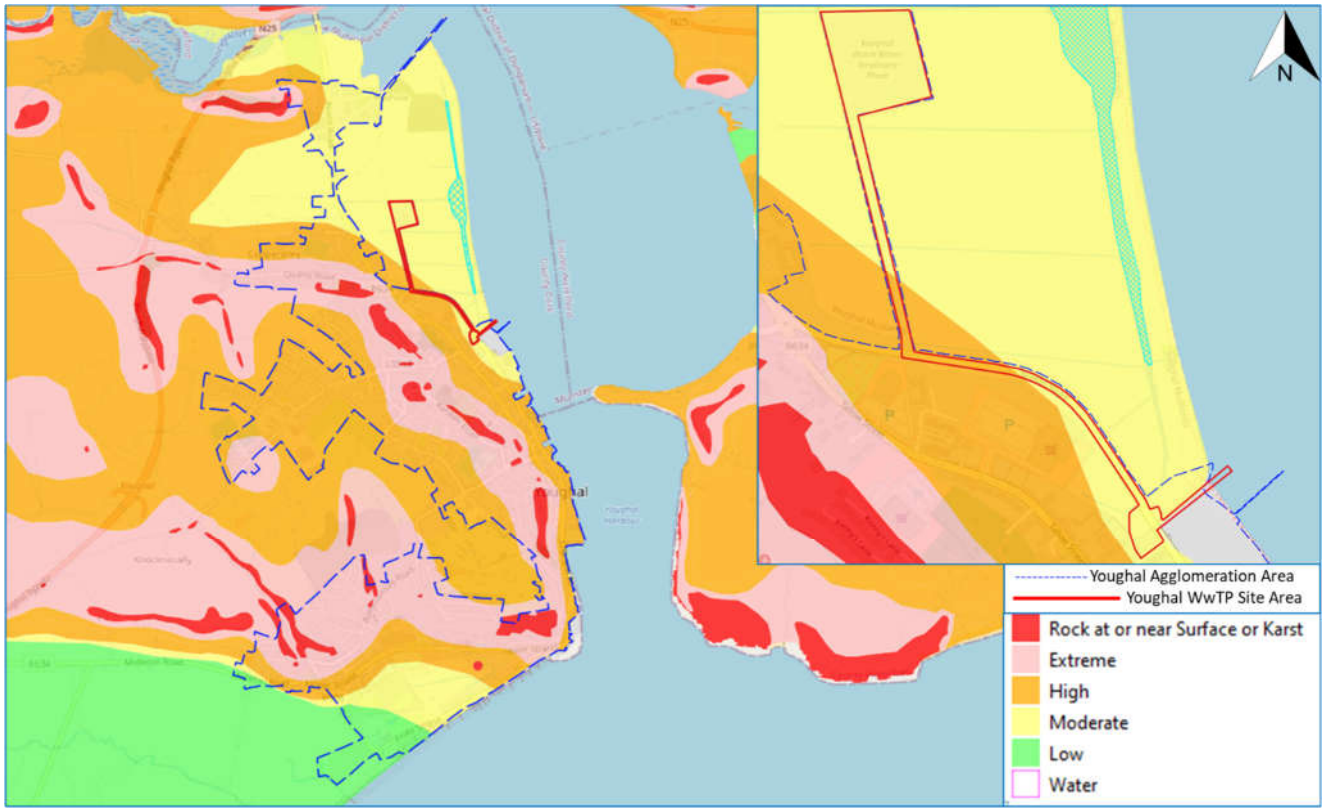


Figure 11.14 - Groundwater Vulnerability (GSI, 2023)

The GSI has devised a system for classifying bedrock aquifers and gravel aquifers in Ireland based on the size and hydrogeological characteristics of these aquifers. The bedrock aquifer beneath the site is generally classified as Poor (P) (which is generally unproductive except for local zone), with the northern portion underlain by a Locally Important Karstified (Lk) bedrock aquifer. There are no gravel aquifers beneath the site or the Youghal Agglomeration. The closest gravel aquifer is located ca.18.6km southwest of the site, the Middleton Gravels (classified as locally important) (GSI, 2023).

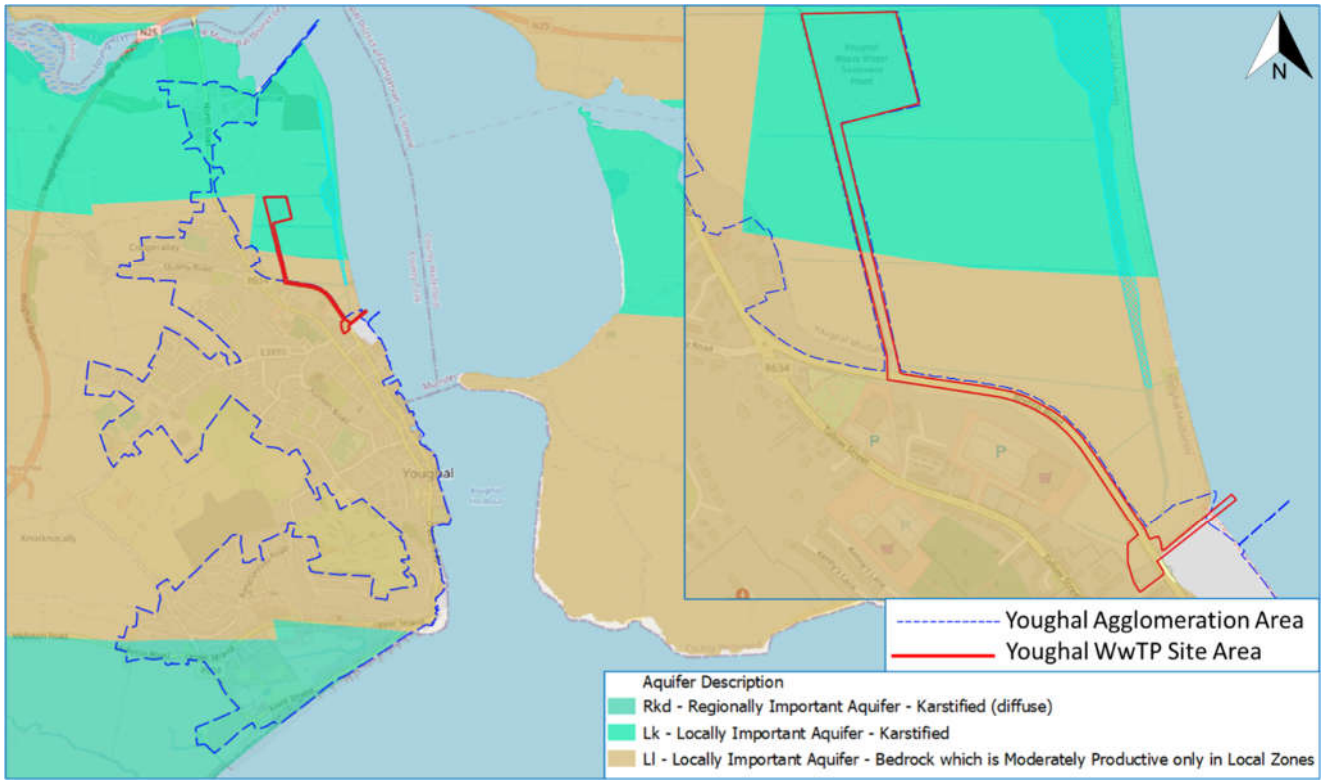


Figure 11.15 - Bedrock Aquifer Classification (GSI, 2023)

The site is within the Glenville Groundwater Body (GWB). The Groundwater Body (GWB) is the relevant management unit under the WFD (EPA, 2023). Groundwater bodies are subdivisions of large geographical areas of aquifers so that they can be effectively managed in order to protect the groundwater and linked surface waters (GSI, 2021).

There is 1no. karst feature, a 'spring' located within Youghal Agglomeration area. There is also a 'cave' lying ca.0.480km southwest of the Youghal Agglomeration boundary (GSI, 2023).

11.5.2. Groundwater Recharge

Recharge is the amount of rainfall which infiltrates to ground and replenishes groundwater levels in bedrock and gravel aquifers. It is dependent on the following key factors: effective rainfall (i.e. total rainfall less evaporation and surface water run-off), transpiration (i.e. uptake by vegetation) and aquifer characteristics (i.e. how easily the aquifer can accept water and store it). Additionally, not all effective rainfall will contribute to recharge due to impermeable materials in urbanised areas and associated drainage and water management infrastructure. The average recharge rate of the locally important bedrock aquifer beneath the site, and the Youghal Agglomeration area ranges between ca. 100 to 400 mm/yr (GSI, 2023), as presented in the figure below.

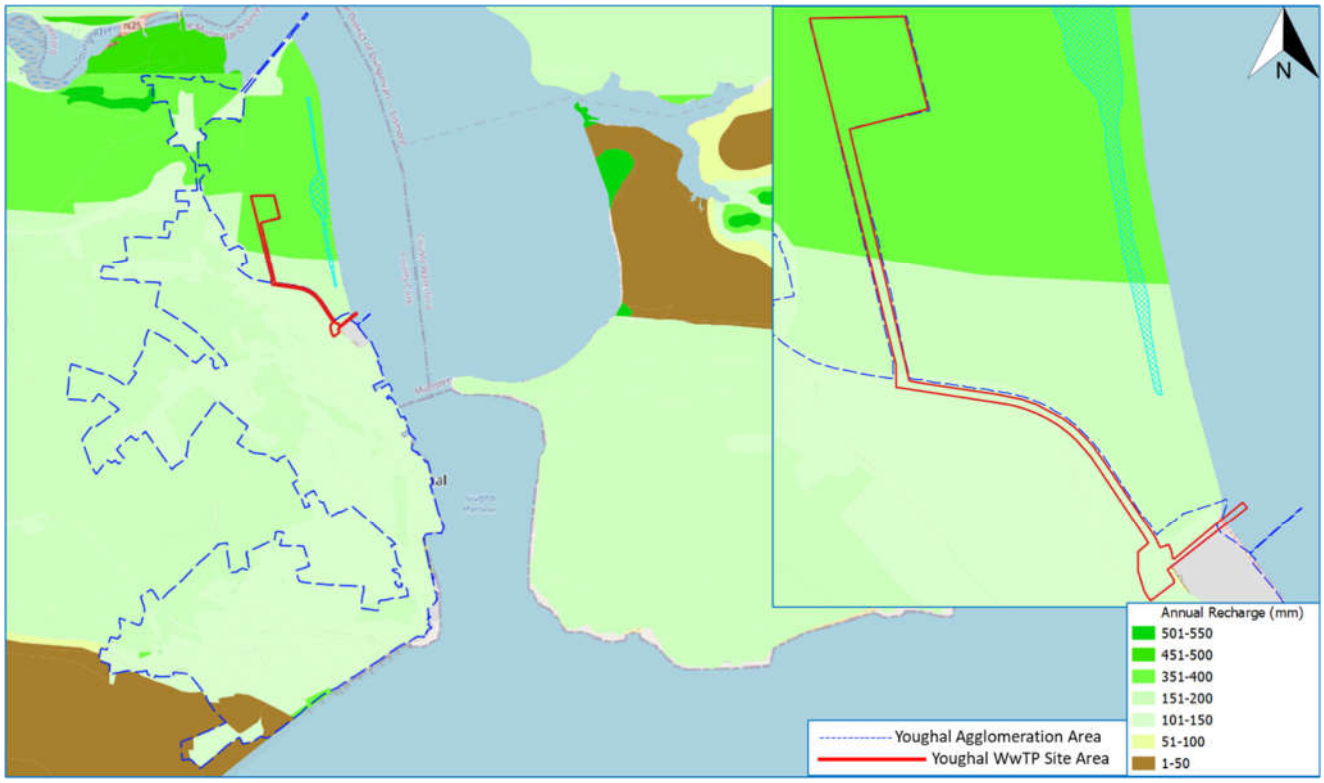


Figure 11.16 - Annual Groundwater Recharge Rate (GSI, 2023)

11.5.3. Groundwater Levels and Flow Direction

The soil deposits underlying the site and the Youghal Agglomeration area comprise soft thinly laminated organic silts and very silty clays with frequent thin sand layers and layers of partially decomposed organic material overlying dense gravel (Atkins McCarthy, 2001). Based on site specific data, these dense gravels were encountered at depths of 9.2m (BH1, located within the western portion of the Youghal WwTP footprint) and 14m (BH2, located within the eastern portion of the Youghal WwTP footprint) beneath the site, and the depth of this stratum increases towards the harbour. The gravel layer is saturated, with groundwater encountered within these deposits, rising to ground level during the site investigation (Atkins McCarthy, 2001).

Therefore, conceptually, groundwater is likely to be encountered at the same depth as the gravel deposits beneath the site i.e. at depths of ca. 9mbgl and deeper, as presented in the figure below. Groundwater flow within the saturated gravel layer is likely to follow topography in an easterly direction before discharging to Youghal Estuary / Harbour.

According to the '*Glenville GWB: Summary of Initial Characterisation'* document (GSI, 2004), the majority of groundwater flow in the general region of the waterbody is in the upper shallow weathered zone, along with a

zone of interconnected fissures, no deeper than 15-30m from the top of the rock. Groundwater discharges to springs within the GWB and to rivers and streams crossing the GWB.[39]

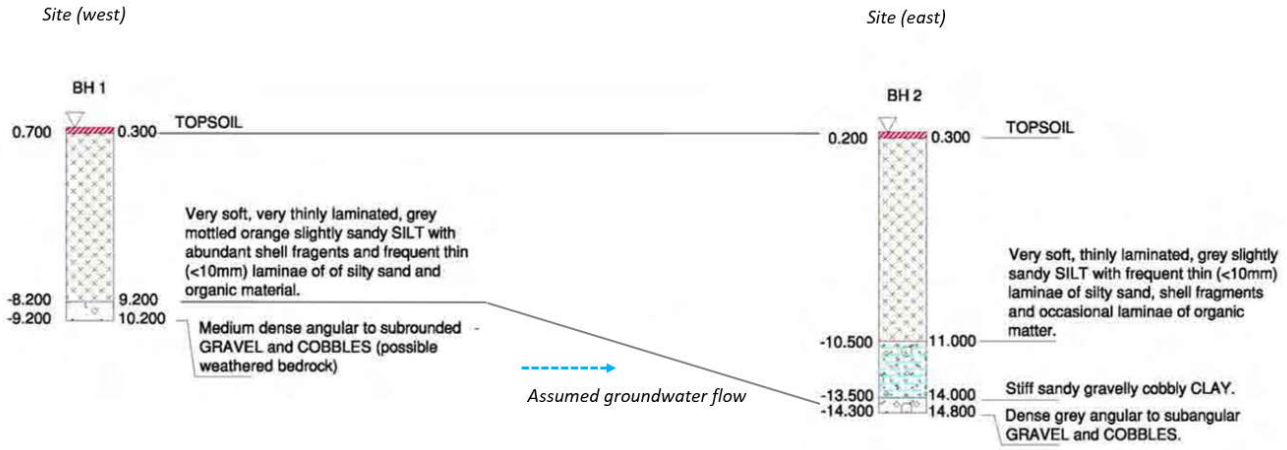


Figure 11.17 – Site specific geology showing depth of saturated gravels (Atkins McCarthy, 2001)

11.5.4. Groundwater Use & Available Resource

The GSI maintains a record of groundwater abstractions consisting of wells and springs, in addition to designated drinking water protection zones (referred to as Source Protection Areas). Based on the GSI database, there are no public water supply or group water scheme abstraction points, or source protection areas, beneath or adjacent to the site (GSI, 2023).

There are 8no. wells and springs located within 100m of the site, as summarised in the following table and presented in the figure below.

Table 11-2 - GSI Groundwater Abstractions Youghal Agglomeration Area (GSI, 2023)

Abstraction ID	Abstraction Type	Location Accuracy (m)	Depth (m)	Yield (m^3/d)	Use
2007SWW046	Borehole	100m	Unknown	Unknown	Public supply
2007SWW108	Borehole	50m	34.5	Unknown	Unknown
2007SWW109	Borehole	50m	23.5	Unknown	Unknown
2007SWW110	Borehole	50m	23	Unknown	Unknown
2007SWW111	Borehole	50m	23	Unknown	Unknown
2007SWW112	Borehole	50m	20	Unknown	Unknown
2007SWW113	Borehole	50m	20	Unknown	Unknown
2007SWW114	Borehole	50m	20.8	Unknown	Unknown

[39] https://gsi.geodata.gov.ie/downloads/Groundwater/Reports/GWB/GlenvilleGWB.pdf

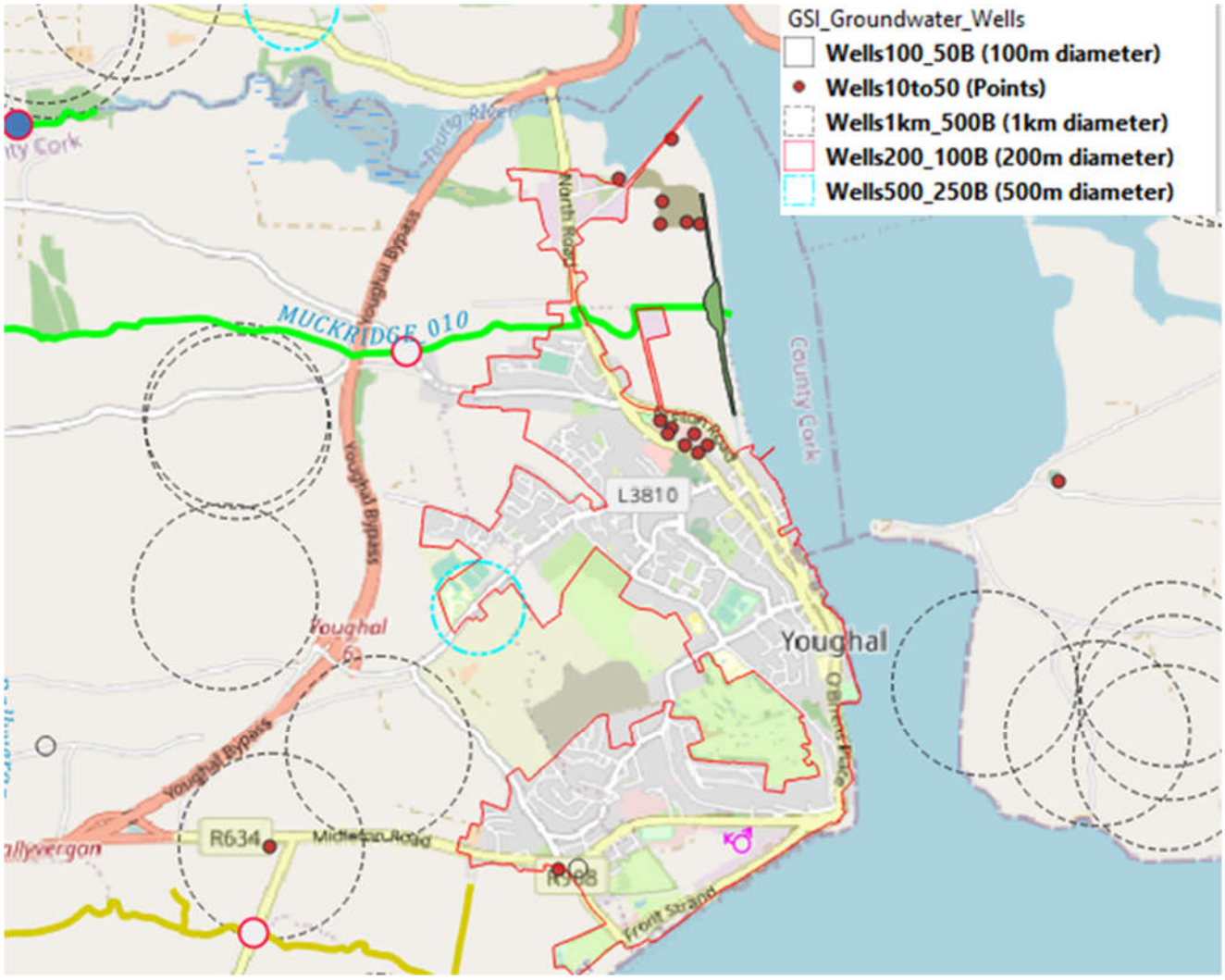


Figure 11.18 – Reported Groundwater Wells (GSI, 2023)

11.5.5. Groundwater Quality

The European Communities Environmental Objectives (Groundwater) Regulations, (S.I. 9 of 2010) came into effect on 27th January 2010. The aim of the Regulations is to achieve the environmental objectives established for groundwater by Article 4 (1) (b) of the Water Framework Directive (2000/60/EC), as amended. The 2010 Regulations, as amended, set down groundwater quality standards for nitrate (50mg/L) and active substances in pesticides in Schedule 4 and also established threshold values for pollutants or indicators of pollutants in Schedule 5. Under these regulations the EPA must assign a status of '*Good*' or '*Poor*' to those bodies of groundwater where available data and knowledge allows.

Regional groundwater quality status for the 2016 to 2021 monitoring period (EPA, 2023) is classified under the WFD as '*Good*' beneath the site and the Youghal Agglomeration area, as presented in the figure below. The site and the vast majority of the Youghal Agglomeration area is classified as '*not at risk*' of failing to meet the relevant WFD objectives by 2027 (EPA, 2023). A minor portion of land in the southern portion of the Youghal Agglomeration area is noted to be *'under review',* as presented in the figure below.

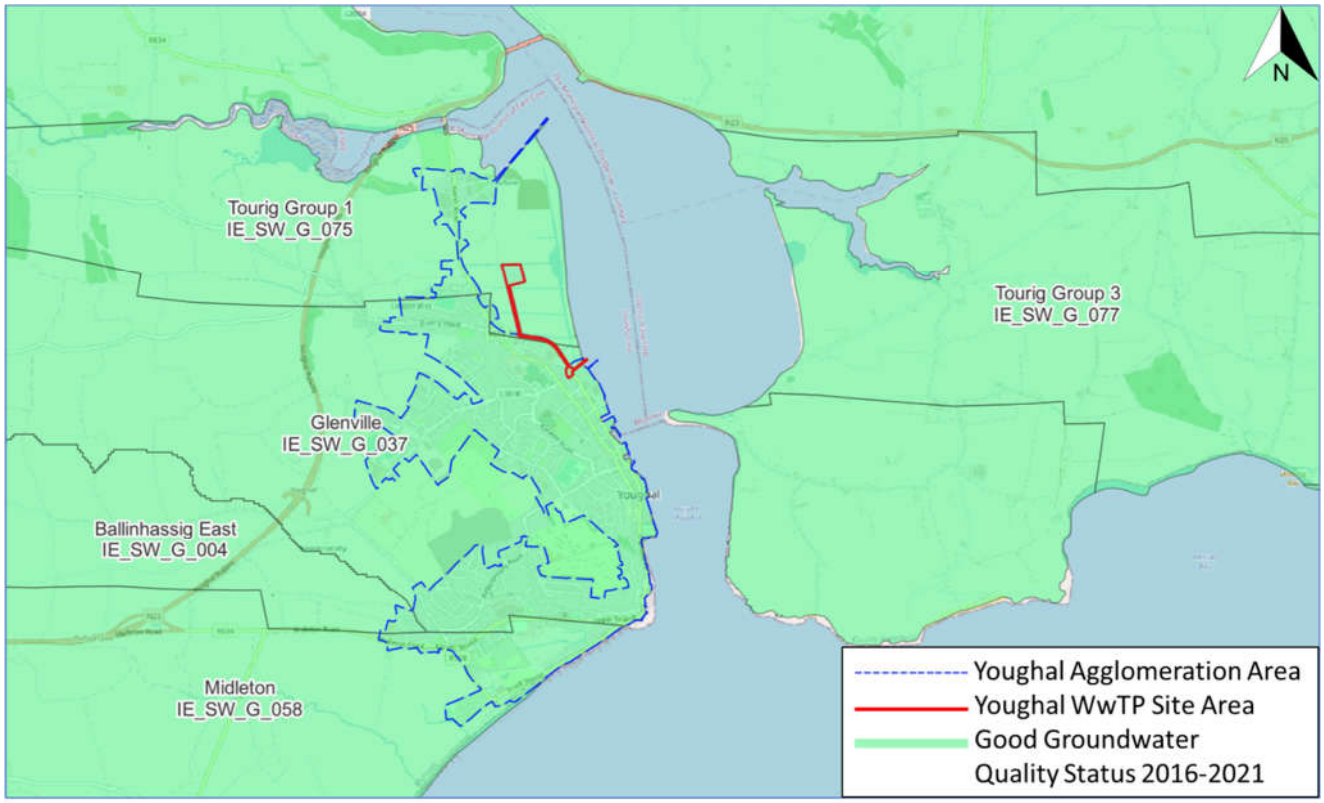


Figure 11.19 - Regional Groundwater Quality Status 2016-2021 (EPA, 2023)

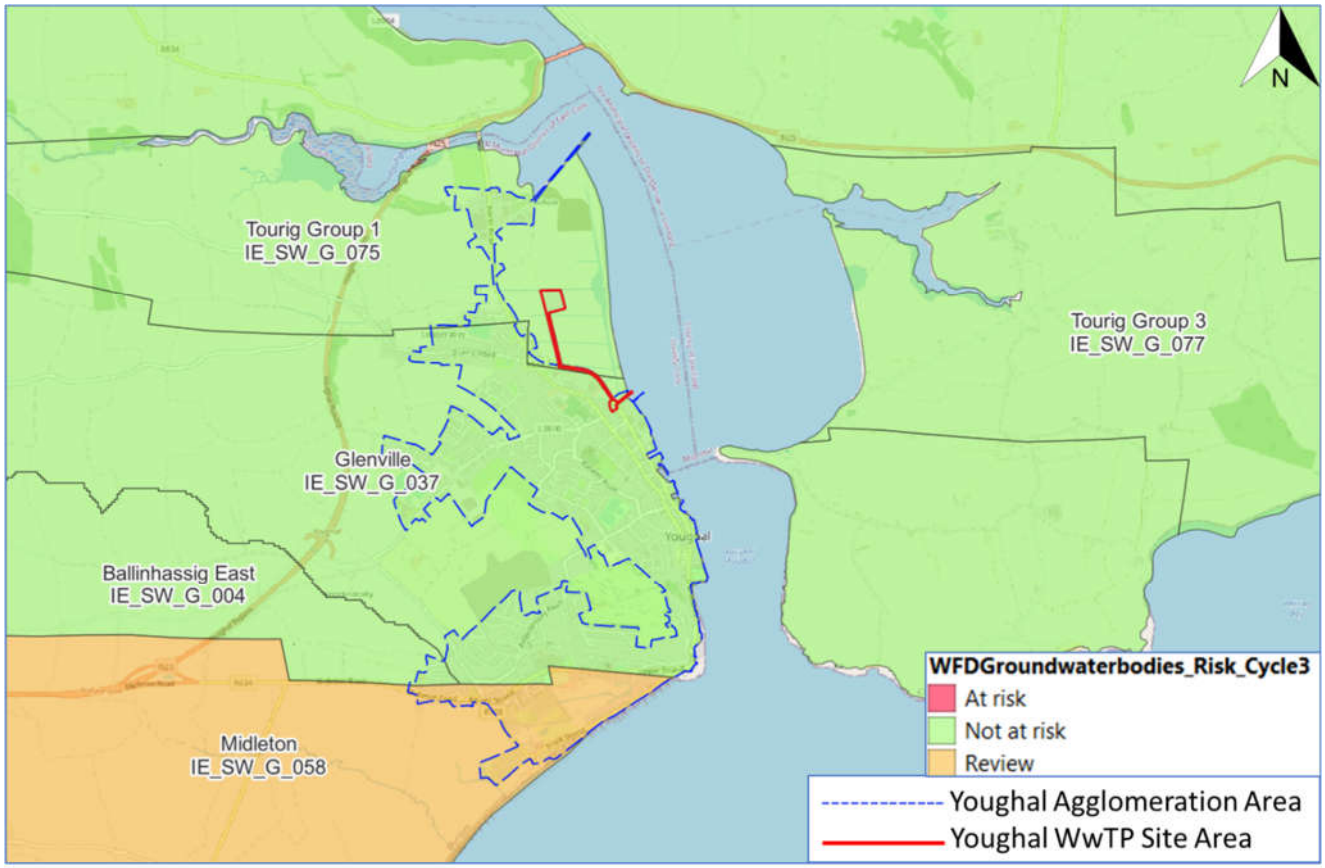


Figure 11.20 - WFD Groundwater Risk Status (3rd Cycle) (EPA, 2023)

11.6. Potential Effects of the Project

11.6.1. Hydrogeological Conceptual Site Model

The following criteria are typically applied when evaluating potential impacts to the water environment:

- Effects to surface water / groundwater quality; and,
- Effects to surface water flows / groundwater resources.

In terms of surface water /transitional water flows and groundwater resources, no significant effects are likely to arise from the project based on the following considerations:

- There are no demolition, construction or decommissioning phases associated with the project. No works are required to facilitate the proposed change of use of Dunn's Park discharge outfall from a temporary to a permanent basis.
- The WwTP, which has been fully operational since 2018, is consented and licenced. Dunn's Park discharge outfall currently operates on a temporary basis, in accordance with the relevant environmental management and monitoring requirements of the wastewater licence. UÉ are seeking to authorise the use of the Dunn's Park discharge outfall as the primary outfall for Youghal WwTP, on a permanent basis. There will be no change to the consented and licenced operational limit of 16,000 PE. The current maximum operational hydraulic load (of ca. 11,338 PE in 2021 [40]) is well below this limit.
- There are 8no. groundwater wells located within the general vicinity of the Site. In addition 2no. rivers, River Glandine and River Tourig, are reported to be abstracted for use as Drinking Water; however both abstractions are located >3km upstream of the project. There are no demolition, construction or decommissioning phases associated with the project. Accordingly due to the nature, scale and location of the project, any offsite groundwater abstraction wells, or upstream surface water abstractions (including the River Glandine and River Tourig) are unlikely to be impacted by the project.
- There are no demolition, construction or decommissioning phases associated with the project. Therefore, there will be no change to rainfall recharge rates at the project, as a result of the project.

Therefore, given the nature of the project there will be no impact to regional or local groundwater resources or surface water / transitional water levels / flows in the receiving Lower Blackwater Estuary / Youghal Harbour. Similarly there will be no impact to drinking waters. Accordingly, potential effects on groundwater resources, groundwater levels or surface water / transitional water levels/ flows do not warrant further consideration.

The type of Geological / Hydrogeological Environment in which the site is located, is described as '*Type A – Passive geological / hydrogeological environments e.g. areas of thick low permeability subsoil, areas underlain by poor aquifers, recharge areas, historically stable geological environments'*, as per the relevant GSI (2013) guidelines.

Based on the current conceptual site model for the site, the use of Dunn's Park discharge outfall on a permanent rather than a temporary basis, and any potential associated surface water / transitional water / coastal water quality effects to identified receptors require further consideration as part of this assessment.

11.6.2. Potential Effects on Water during the Construction phase

There are no demolition, construction or decommissioning phases associated with the project. Therefore there are no associated effects.

11.6.3. Potential Effects on Water during the Operational Phase

During the operational phase of the development, there could be a potential impact on receiving surface water / transitional water quality, which could result in the following effects on identified potential receptors:

- Surface waters:
  - The River Muckridge located adjacent to the site;
  - The East Ballyvergan river, located downstream of the site and the Youghal agglomeration area.
- Bathing Waters (coastal waters):
  - Youghal Front Strand Beach (Ref: IESWBWC020_0000_0300), located downstream of the site and adjacent to the Youghal Agglomeration area;
  - Youghal Claycastle (Ref: IESWBWC020_0000_0200); located downstream of the site and adjacent to the Youghal Agglomeration area, and,

[40] Based on 2021 period for licence Ref: D0139-01 as noted in the supporting NIS report (Uisce Eireann, 2023)

  - Redbarn (Ref: IESWBWC020_0000_0100), located downstream of both the site and the Youghal Agglomeration area.
- Shellfish Waters:
  - Ballymacoda Bay (Ref: IE_SW_020_0000) located ca. 6.5km south west of the Youghal Agglomeration area;
- Nutrient Sensitive Waters:
  - Lower Blackwater M Estuary / Youghal Harbour (Ref: IE_SW_020_0100) transitional waters; and,
- Designated European Sites:
  - Blackwater River (Cork / Waterford) SAC (Ref: 002170);
  - Blackwater Estuary SPA (Ref: (004028); and,
  - Blackwater River and Estuary pNHA (Ref: 000072).

Marine Modelling Study to determine Water Quality Effects

Between 2020 to 2023, a Marine Modelling Study was undertaken by AECOM on behalf of the applicant, UÉ. AECOM was commissioned by UÉ in 2019 to complete a Marine Modelling Study to help in the assessment of discharges of treated wastewater from the Youghal WwTP to the tidal River Blackwater.

A licence review application of the existing Licence (D0139-01), which was granted under the European Union (Waste Water Discharge) Regulations, 2007 - 2020, was submitted in June 2021 to EPA and was supported with an assessment of the potential impacts on environmental water quality. The Marine Modelling Study provided the details of the modelling work completed to assess the significance of the discharges, to support the determination of the environmental impact (if any) of the discharges and to inform the licence Review.

The Marine Modelling Study was undertaken in four phases as follows:

- Phase 1: Model Scoping Report (AECOM, 2020a);
- Phase 2: Survey Interpretive Report (AECOM, 2020b);
- Phase 3: Calibration and validation Report (AECOM, 2020c); and,
- Phase 4: Modelling Report (AECOM, 2020d).

An addendum to the Modelling Report has been prepared (AECOM, 2023). The purpose of this addendum is to report on an assessment of the discharges from Wastewater Treatment Plants (WwTPs at Lismore, Cappoquin and Youghal) and Storm Water Overflows (SWOs) (including emergency overflows) to the Lower Blackwater M Estuary / Youghal Harbour to support the EIAR. Refer to Appendix 11.1.

The potential impact from the UÉ discharge location at Dunn's Park has been evaluated at the design capacity of the Youghal WwTP and predicted growth rates for the other two WwTPs. The updated modelling assessment (AECOM, 2023) has been prepared specifically to assess the following key potential impacts;

1. Unit Impact Assessment (UIA) for Escherichia coli (EC) and Intestinal Enterococci (IE); and,
2. A flow-weighted mass-balance based nutrient impact calculation using EPA/OSPAR/RID data for the Lower Blackwater M Estuary / Youghal Harbour waterbody.

Refer to Appendix 11.1 to 11.5 for a copy of all of the reporting phases of the Marine Modelling Study (2019-2023) including the Marine Modelling Study Addendum (AECOM, 2023), in Appendix 11.1, which has been prepared specifically for this project and EIAR.

The detailed and comprehensive modelling 2023 exercise has used the two alternative approaches (i.e. UIA and Annual Mass Balance approach), as outlined above, to assess any potential impacts of the Youghal WwTP and SWOs (including emergency overflows) on sensitive receptors.

Taking the UIA approach, AECOM (2023) have confirmed the following:

- **Impact on Bathing Waters**
  - '*The assessments show that all bathing waters (and types of shellfish and aquaculture areas) achieve an indicative quality of "Excellent" bathing water status for both EC and IE. This is in line with the sampling reported on www.Beaches.ie for the past four years (2019 to 2022) at each of the beaches*.'
- **Impact on Shellfish Waters**

- ‘*The assessment against the criteria agreed with the EPA shows that the designated shellfish waters, classified production areas and aquaculture sites all meet both the target of 97th percentile < 110cfu/100ml for all receptors and geomean < 110cfu/100ml for all receptors.’*
- ‘*The results show that for Future loads (section 2.2) all receptors “meet the target” for both criteria and therefore all receptors “meet the targets” for the overall assessment which requires both targets to be met’.*

- **Source Apportionment**
  - ‘*For the purposes of source apportionment, extraction points have been established for all sensitive receptors. Extraction points labelled -4 to +4 are along the western edge of the Youghal Harbour aquaculture area approximately 50m apart, and extraction point 0 is 60m from the Dunn’s Park outfall location’.*
  - *‘The UIA demonstrates that none of the extraction points have a concentration that is higher than the assessment thresholds for the bathing water or shellfish water assessments, and therefore the discharges from Youghal Wastewater works and SWOs (and EOs) are compatible with the achievement of the water framework directive’.*

Relevant results are presented in the following tables.

Table 11-3 – List of receptors with co-ordinates and references Identified Receptors (Ref: R001 – R015) (AECOM, 2023)

No	Name	Easting	Northing
R001	-4	210439	78665
R002	-3	210457	78619
R003	-2	210476	78572
R004	-1	210494	78526
R005	0	210513	78479
R006	+1	210531	78433
R007	+2	210549	78386
R008	+3	210568	78340
R009	+4	210586	78293

No	Name	Easting	Northing
R010	Youghal Front Strand Beach	210550	76200
R011	Youghal Clay Castle Beach	209750	75660
R012	Ballymacoda Des. Shellfishery	208263	72378
R013	Classified Production Area	210832	76245
R014	NE corner of aquaculture areas	208702	72772
R015	Youghal SW002	210996	77419

Table 11-4 – Summary of Source Apportionment Modelling Results for Identified Receptors (Ref: R001 - R015) (AECOM, 2023)

No	EC	IE		No	EC	IE
R001	70	27		R009	96	33
R002	153	48		R010	36	14
R003	150	47		R011	18	8
R004	116	38		R012	5	3
R005	133	43		R013	56	21
R006	109	36		R014	5	3
R007	95	33		R015	64	24
R008	116	38				

Notes

1. Statutory thresholds for 'Good' Status are: EC <=500 cfu/100ml; IE<=200 cfu/100ml. All predicted EC and IE counts are well below these thresholds.
2. Receptor Ref: R005 is the closest modelled point to Dunn's Park outfall and is located 60m from the outfall location.

Taking the Annual Mass Balance approach, AECOM (2023) have confirmed the following:

- **Contribution to Blackwater Estuary:**
  - *'The percentage contribution of the WwTPs and SWOs in 2022 to the Blackwater estuary is less than 3% for all parameters, of which the Youghal WwTP is a fraction.'*
  - *'The number of water quality samples for the main rivers (Blackwater and Bride) represents a wide range of flow conditions and is considered sufficient to demonstrate that the WwTPs and SWOs do not contribute more than approximately 3% of the annual load of ammonia, BOD, DIN or ortho-P to the Blackwater estuary.'*

The Marine Modelling Study Addendum (AECOM, 2023) has made the following key conclusions:

- The Marine Modelling Study for Youghal has been updated to include a Unit Impact Assessment and a Flow Weighted Mass Balance calculation.
- The conclusions of the unit impact assessment and flow weighted mass balance calculations are:
  1. The count of EC and IE bacteria at the designated bathing beaches (95th percentile for the summer) is such that the indicative quality is Excellent.
  2. The count of EC bacteria in the designated shellfish waters, classified production areas and aquaculture sites (annual 97th percentile and geomean) are such that all areas Meet the Targets agreed with the EPA.
  3. The source apportionment plots for all extraction locations demonstrate that the discharge from the Youghal WwTP is not a significant contributor to the total concentration for the 5% of the time that the 95th percentile is exceeded.
  4. The Youghal WwTP and associated SWOs account for less than ca. 2.5% of the ammonia, 0.2% of the BOD, 2.75% of ortho-P and 0.05% of DIN discharged to the Blackwater River (M) waterbody each year.
- Based on the findings above it is concluded that the Youghal WwTP, operating at the design capacity of 16,000PE and discharging through the Dunn's Park outfall, will not have a significant effect on the following:
  - The current WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies.
  - The bathing water quality at the beaches (Youghal Front Strand and Claycastle).

- The water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay.

The above conclusions from the detailed modelling report are verified by available monitoring data for key indicator parameters at monitoring locations upstream and downstream of the site, for the assessment period of 2019-2022, when the WwTP was fully operational, as discussed in detail in Section 11.4 of this assessment. Therefore, based on the findings of this assessment, the project will have a not-significant long-term negative effect on surface water / transitional water quality. Accordingly likely effects (with respect to water quality impacts) to the following identified receptors will be not significant;

- The River Muckridge located adjacent to the site, or the East Ballyvergan river, located downstream of the site and the Youghal agglomeration area.
- Lower Blackwater M Estuary and Youghal Harbour transitional waterbodies;
- Identified Bathing waters at Youghal Front Strand Beach, Youghal Claycastle and Redbarn; and,
- Identified Shellfish Waters at Ballymacoda Bay, the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay.
- Designated European Sites: Blackwater River (Cork / Waterford) SAC (Ref: 002170); Blackwater Estuary SPA (Ref: (004028); and Blackwater River and Estuary pNHA (Ref: 000072).

11.7. Mitigation Measures

11.7.1. Construction Phase

There are no demolition, construction or decommissioning phases associated with the project. Therefore there are no associated mitigation measures.

11.7.2. Operational Phase

Based on the findings of this assessment no mitigation measures associated with the operational phase of the project are required.

Standard measures / monitoring requirements will be adhered to during the operational phase.

11.8. Monitoring Requirements

Based on the findings of this assessment no monitoring requirements associated with the operational phase of the project are required.

Standard measures / monitoring requirements will be adhered to during the operational phase.

11.9. Residual Effects

The project as proposed will not result in any negative effects to the existing hydrogeological regime of the area.

The residual effect to surface water / transitional water quality resulting from the use of the Dunn's Park discharge outfall as the primary outfall, on a permanent basis, will be negative, not significant and long-term.

Effects (with respect to water quality impacts) are likely to be not significant, and long-term, with regards to the following identified receptors;

- The River Muckridge or the East Ballyvergan river.
- Lower Blackwater M Estuary and Youghal Harbour transitional waterbodies;
- Identified Bathing waters at Youghal Front Strand Beach, Youghal Claycastle and Redbarn; and,
- Identified Shellfish Waters at Ballymacoda Bay, the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay.
- Designated European Sites: Blackwater River (Cork / Waterford) SAC (Ref: 002170); Blackwater Estuary SPA (Ref: (004028); and Blackwater River and Estuary pNHA (Ref: 000072).

Therefore, no significant negative effects are likely to occur within the receiving water environment arising from the project during the operational phase.

On a regional scale, the project is not likely to affect the current *'moderate'* water quality status of both the Lower Blackwater M Estuary / Youghal Harbour transitional waterbody at the discharge point of the site, and the Youghal Bay coastal waterbody downstream of the site, and is not likely to affect the current *moderate'* surface water quality status of the River Muckridge, or the '*good'* surface water quality status of the East Ballyvergan river, as required under the European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (as amended).

Similarly, the project will not affect the current '*good'* groundwater quality status of the Glenville Groundwater Body, as required under the European Communities Environmental Objectives (Groundwater) Regulations, 2010, as amended. The project will not be likely to cause a deterioration in surface / transitional / coastal water or groundwater status or compromise the ability of any identified waterbodies to comply with the objectives of the Water Framework Directive.

No significant effects to receiving surface waters / transitional / coastal waters or groundwater are likely as a result of the project.

11.10. Do Nothing Scenario

If the project is not undertaken the baseline water environment would remain unchanged. The 'do-nothing' scenario would result in likely neutral effects with regards to hydrology and hydrogeology.

11.11. Reinstatement

There are no demolition, construction or decommissioning phases associated with the project. Therefore no reinstatement is required.

11.12. Cumulative Effects

The residual effect to surface water / transitional water quality resulting from the use of the Dunn's Park discharge outfall as the primary outfall, on a permanent basis, will be not significant and long-term. Any effects to surface water receptors identified as part of the water assessment will be not significant. A review of all relevant projects (committed developments, consented projects, granted / approved developments, and projects applied for relevant consents, and licensed and permitted projects) listed within Table 13.1 (Cumulative Impacts Assessment of Projects) of Chapter 13 has been undertaken. No significant cumulative effects are likely.

11.13. Difficulties encountered

There were no specific difficulties encountered when carrying out this assessment.

12. Material Assets

12.1. Introduction

The Material Assets EIAR chapter has been co-authored by Avril McCollom and Julie Larkin.

Avril McCollom is an Environmental Consultant with Atkins and has 5 years' experience in environmental assessments. Avril holds bachelor's degree in Freshwater and Marine Biology and is an associated member of Institute of Environmental Management & Assessment.

Julie Larkin is a Senior Environmental Consultant with Atkins and has 8 years' experience in environmental assessments. Julie holds a bachelor's degree in Environmental Science and a Masters degree in Environmental Management and Protection. Julie is a chartered member of the Chartered Institute of Water and Environmental Manager.

According to relevant EPA guidance (EPA, 2022) the following topics warrant consideration under material assets:

- Built Services;
- Roads and Traffic; and
- Waste Management.

Roads and traffic have been assessed separately as part of this EIAR. Refer to Chapter 7 – Traffic. Therefore, this chapter identifies describes and assesses the likely significant effects on material assets serving the project specifically in relation to existing and proposed built services (i.e., foul sewerage, surface water drainage, water supply, gas, electricity, and telecommunications utilities), and waste management; both of which are assessed separately within this section.

There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. On this basis, there are no potential effects of the existing built services and waste management in the vicinity associated with any construction phase and hence this phase has been scoped out of further assessment.

12.2. Built Services

12.2.1. Assessment Methodology

The methodology and terminology used to prepare this section of the EIAR is in accordance with the EPA '*Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)'* (2022), specifically Table 3.4 Descriptions of Effects. The following sources have been used to collate information on built services within the general area of the Site;

- Available utility information and maps received from UÉ;
- Eir Telecoms;
- Gas Utilities; and,
- ESB Network Utility Plans.

The project entails the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall. The Dunn's Park discharge outfall is currently operational as a temporary discharge location. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur.

12.2.2. Receiving Environment

The site is located ca. 1.3km north of the town centre, in an area called the Mudlands. The site is generally bounded to the north by mudlands and greenfields, to the east by mudlands and River Blackwater Estuary and to the south and west by mudlands, greenfields and residential properties. The site is primarily zoned as '*YL-GC-06 (Green Conservation')* in the Cork County Development Plan 2022-2028, which states that:

'This area, consisting predominantly of woodland and agricultural land, forms an important visual part of the setting to Youghal particularly when seen from the north. The site forms part of a significant ecological green infrastructure corridor adjoining the estuary and supports wetland habitats including salt marshes, reed beds, marshes and lagoons. The existing pattern of land uses will remain largely unchanged. Parts of this area are

important for overwintering wetland birds associated with the estuary. There may be opportunities for biodiversity enhancement of this area which should be encouraged' (Cork County Council (CCC), 2022).

A small section of the project site is zoned '*Existing residential/mixed residential and other uses'*. Section 18.3.5 of the Plan states that '*These areas generally have a primary or strong residential component but which also provide for non-residential uses which protect and improve the primary use of these areas'* (CCC, 2022).

12.2.2.1. Storm Water Drainage

There is existing storm water drainage infrastructure within the WwTP and the Dunn's Park discharge outfall. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. There will be no change to the existing storm water drainage system.

12.2.2.2. Foul Water Drainage

The Youghal WwTP has a biological treatment capacity of 16,000 PE. The current treatment process is described within Chapter 2 – project description.

Foul water drainage generated on site is treated at the WwTP. Dunn's Park (SW000) is currently operating as a temporary discharge outfall location for Youghal's WwTP under discharge licence Reg No. D0139-01. The final treated effluent currently outfalls to the existing sea outfall (Dunn's Park) which comprises of a 750mm diameter outfall, discharging to the Blackwater Estuary (210464E 78504N).

Stormwater and Emergency Overflows associated with Yougahl WwTP:

- SW002 - Storm Water Overflow from Greenpark Pumping Station;
- SW005 - Storm Water Overflow from Front Strand Pumping Station;
- SW006 - Storm Water Overflow from Greenpark Pumping Station;
- SW007 - Storm Water Overflow from Dunnes Park Pumping Station;
- SW008 - Emergency Overflow from Foxhole Pumping Station;
- SW010 - Storm Water Overflow from Summerfield Pumping Station; and,
- SW011 - Storm Water Overflow from Dunnes Park Pumping Station.

There are no changes required to the existing foul water drainage infrastructure to facilitate the project. There will be no change to the existing foul water drainage system.

12.2.2.3. Water Supply & Distribution

The WwTP is currently serviced by a public water supply.

12.2.2.4. ESB Supply

There is an existing underground ESB service running into the existing WwTP. There is an existing overhead ESB services running along the access road to the WwTP and to the west of Dunn's Park discharge pipe.

12.2.2.5. Gas and Telecoms

There are no gas or telecoms within the WwTP.

12.2.3. Impact Assessment

12.2.3.1. Potential Effects during the Construction phase

Youghal WwTP is currently using the Dunn's Park discharge outfall as a temporary discharge location. There are no demolition, construction or decommissioning phases as part of the project and characteristics of the project are the same as those included above, therefore no changes are required to the existing built services / utilities to facilitate the project. Therefore there are no associated effects.

12.2.3.2. Potential Effects during the Operational Phase

There will be no changes to the existing built services / utilities as part of the operation phase of the project. Hence the effect is neutral, imperceptible and long term. There will be no likely significant effects regarding built services during the operational phase.

12.2.4. Do Nothing Scenario

The material assets assessment assumes that under the 'Do-Nothing' scenario the project no changes would be made to the existing infrastructure and / or discharge rates, similar to what is proposed under the project. Thus, there would be a neutral effect on built assets within the vicinity of the project. There will be no likely significant effects regarding built services under the 'Do-Nothing' scenario.

12.2.5. Cumulative Effects

A review of all projects (committed developments, consented projects, granted / approved developments, and projects applied for relevant consents, and licensed and permitted projects) listed within Table 13.1 (Cumulative Impacts Assessment of Projects) of Chapter 13 has been undertaken. No significant cumulative effects are likely. The proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall will not act in combination with other project (listed in Table 13.1.) to result in any predicted cumulative effects on the built services are predicted. Therefore no significant cumulative effects are likely.

12.2.6. Mitigation Measures

There are no required mitigation measures associated with the operational phase of the project.

12.2.7. Residual Effects

There will be no residual effects associated with built services.

12.2.8. Monitoring Requirements

As the project will not require any mitigation measures for the material assets it will also have no requirements for monitoring of any measures.

12.3. Waste Management

12.3.1. Assessment Methodology

This section of the EIAR has been prepared in accordance with the EPA '*Guidelines on the information to be contained in Environmental Impact Assessment Reports'* (2022), *'*and '*Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects*' (EPA 2021).

This assessment has also been informed by findings of the Chapter 6 – Land, Soils and Geology section of this EIAR.

12.3.2. Receiving Environment

Based on a review of historic maps (including available 6-inch historic maps (1829-41), 25-inch historic maps (1897-1913), Cassini 6-inch historic maps (1830-1930) and aerial photographs (1995 to 2012) from the Ordnance Survey of Ireland) (OSI, 2023) and current aerial photography (Bing Maps, 2023) the site was primarily vacant area of slob lands and agricultural land until the construction of the Youghal WwTP in 2017. The site is within the Mudlands of Youghal and is underlined with marine beach sands.

The site is currently operating as per the requirements of the existing Wastewater Discharge Licence (EPA Ref: D0139-01) and discharge via Dunn's Park outfall to the Blackwater Estuary.

12.3.3. Impact Assessment

12.3.3.1. Potential Effects during Construction phase

Youghal WwTP is currently using the Dunn's Park discharge outfall as a temporary discharge location. There are no demolition, construction or decommissioning phases as part of the project, hence there is no proposed works, and no waste will be generated. Therefore there are no associated effects.

12.3.3.2. Potential Effects during Operation

Youghal WwTP has a design capacity of 16,000 P.E and Dunn's Park discharge outfall has capacity to meet the maximum design discharge of16,000 P.E. There are ca. 1-2 vehicle movement per week for sludge and 1 vehicle movement per week for non-sludge and one operator per day. This equates to 1 to 2 vehicles per week accessing the site and one car per day entering and exiting the site during the operation phase. The sludge is collected by ENVA and delivered to one of their facilities in Cork.

There will be no changes to the design or process of the current WwTP or Dunn's Park outfall pipe. The project is currently discharging the final treated effluent at Dunn's Park discharge outfall which is currently operational as a temporary discharge location. This application is seeking consent to make the discharge outfall, Dunn's Park, permanent for the final effluent at the current location; (210464E 78504N).

Currently during the operational phase the treated effluent is discharging via Dunn's Park discharge outfall to the Blackwater Estuary, which gives rise to waste. There will be no changes to the existing WwTP process, operations and/or discharge hence there will be no change to the discharge at Dunn's Park.

The site is currently operating as per the requirements of the existing Wastewater Discharge Licence (EPA Ref: D0139-01) and will continue to operate to the conditions of the reviewed licence. The existing infrastructure within

the WwTP and the existing Dunn's Park outfall infrastructure have already been constructed and are currently operating and are maintained in accordance with all UÉ requirements and standard best practice guidelines.

There are no changes to the current operations of the site, hence the effect is neutral, imperceptible and long term. There will be no likely significant effects regarding waste during the operational phase.

12.3.4. Do Nothing Scenario

There would be a neutral effect on waste within the vicinity of the project. There will be no likely significant effects regarding waste under the 'Do-Nothing' scenario.

12.3.5. Cumulative Effects

The cumulative effects consider the impacts of other projects, listed in Table 13.1 (committed developments, consented projects, granted / approved developments, and projects applied for relevant consents, and licensed and permitted projects) which have been cumulatively assessed. The proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall will not act in combination with other project (listed in Table 13.1.) to result in any predicted cumulative effects on the waste management are predicted. Therefore no significant cumulative effects are likely.

With regard to proposed built services and waste management strategies, no potential cumulative effects are anticipated for the project as there are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. There will be no likely significant effects associated with built services and waste management.

12.3.6. Mitigation Measures

There are no required mitigation measures associated with the operational phase of the project.

12.3.7. Residual Effects

There are no residual built services and waste management effects associated with this project.

The operational phase will have no residual effects on the built services and waste management. The effects of the operational phase are determined to be neutral, imperceptible and long term.

12.3.8. Monitoring Requirements

No monitoring is required for this project.

12.3.9. Difficulties encountered

There were no specific difficulties encountered when carrying out this assessment.

13. Cumulative Effects

13.1. Introduction

This chapter assesses the potential for the project to act in combination with committed developments, consented projects, granted / approved developments, and projects applied for relevant consents, and licensed and permitted projects within the vicinity to result in cumulative impacts on the environment. Each of the technical chapters within this EIAR (i.e. Chapters 3 to 12) have considered the potential for cumulative impacts with committed developments in the vicinity of the project.

The EIA Directive states that at EIAR should contain cumulative effects, which are defined as:

'A description of the likely significant effects of the project on the environment resulting from…the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources.'

The cumulative effects assessment considers developments which have potential for cumulative effects with the project and which have planning permission. The assessments of interactions and cumulative effects presented in this chapter draw on the method of assessment and assessment findings reported in Chapters 3 to 12 and information available in the public domain relating to other known schemes within the study area.

13.2. Methodology

Potential cumulative impacts are defined as '*the addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects'* (EPA 2022) and have been considered for each environmental topic within this EIAR.

A summary of all committed development in the immediate environs of the project, which have been approved by CCC and an Bord Pleanála (ABP) within the last 5 years have been reviewed as part of the preparation of this EIAR. The majority of these developments have already been constructed or are of small scale in nature (i.e. extension works, or property retention works) or are considered to be a reasonable distance from the project and do not warrant further consideration as part of this assessment.

EPA licenced facilities within 5km of the project have been reviewed as part of the preparation of this EIAR.

A review has also been carried out of any relevant discharge licences and aquaculture licences (applied for relevant consents, permits and / or licences, and licensed and permitted projects).

Based on a review of planning records, EPA licenced facilities, relevant discharge licences, aquaculture licences and applying for consent licences a list of committed developments has been compiled (and is presented in Chapter 13, Volume 2 EIAR) which require further consideration in relation to potential cumulative effects with the project, as part of this assessment.

13.3. Cumulative Impact Assessment

Cumulative effects consider the impacts of other schemes which have potential for cumulative effects with the project. As explained above, this chapter focuses on developments which have planning permission. Refer to Table 13.1.

Table 13.1 - Cumulative Impacts Assessment of Projects

Reference No.	Projects	Project Summary	Cumulative Impacts Assessment
226368 – RFI Stage, submitted on 20/10/2022	T&M Fitzgerald Limited	(i) The construction of 17 no. dwellings (4 no. two storey semi-detached dwellings, 3 no. two storey terraced dwellings and 10 no. two & three storey detached dwellings); each dwelling is served by a rear garden private amenity space, on site and or street side car parking. (ii) provision of public open space to serve the development (shared with the existing Ard Caladh Estate), street lighting, internal roadways with connection to Upper Cork Hill via the existing road network within the completed Ard Caladh, Cnoc Aoibhinn & Gort Aoibhinn estates, footpaths, foul and SUD's surface drainage, landscaping & boundary treatments and all ancillary infrastructure and engineering works necessary to facilitate the development.	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the proposed T&M Fitzgerald Limited) are not likely to occur.
175245 - Granted 19/12/2027	Power Capital Renewable Energy Limited	Construction of an up to 5MW solar PV farm, with an export capacity of 4MW, comprising approximately 14,000 no. photovoltaic panels on ground mounted galvanized steel frames within a site of 5.44ha and all associated development including; 4 no. transformer stations, 4 no. auxiliary transformer stations, 4 no inverters, 1 no. client side substation, 1 no. single storey storage building, 1 no. single storey communications building, 1 no. single storey DNO substation building, 3 no. CCTV security cameras mounted on 4m high poles, upgraded vehicular access from the public road, site access gate, perimeter security fencing (2m high).	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the proposed Power Capital Renewable Energy Limited) are not likely to occur.

Reference No.	Projects	Project Summary	Cumulative Impacts Assessment
204407 – Granted 26/11/2020	Power Capital Renewable Energy Limited	Construction of a 10 year planning consent for a 2.57ha extension to the solar PV farm permitted under Cork County Council planning consent reference number 17/05245 and will involve the incorporation of a 2.2 ha portion of the field to the north east of the permitted site on which approximately 5,016 additional photovoltaic panels on ground mounted galvanised steel frames will be installed. Associated works proposed include; 1 no CCTV security camera mounted on 4m high pole, internal access roads and perimeter security fencing (2m high). In addition, an alternative grid connection to the previously permitted on-site grid connection is proposed involving a connection to the existing Foxhall ESB substation and associated works via the R634 and private lands. A Natura Impact Statement will be submitted to the planning authority with the application.	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the proposed Power Capital Renewable Energy Limited) are not likely to occur.
VA04.310798 – (ABP-310798-21) Granted 19/05/2022 (Portal ID: 2021130)	Eirgrid Plc - Electricity Development Application	Proposed development of that portion of an electricity transmission interconnector (Celtic Interconnector) to be constructed onshore in Ireland to the mean high water mark, including a connection to the Irish National Grid, an electricity converter station and all associated and ancillary works.	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the proposed EirGrid Plc) are not likely to occur.

Reference No.	Projects	Project Summary	Cumulative Impacts Assessment
FS006916 (Portal ID: 2021131)	EirGrid Celtic Interconnector Electricity Cable, Co. Cork	Foreshore application for the installation of a submarine High Voltage Direct Current (HVDC) electricity cable EirGrid PLC are applying for a licence for the Celtic Interconnector project. The Celtic Interconnector is a proposed electrical link, consisting primarily of a subsea cable, which will enable the movement of electricity between Ireland and France and will be the first direct energy link between the two countries, running from the south coast of Ireland to the north-west coast of France. This proposed international development will constitute high technology infrastructure that is approximately 575km in length across both terrestrial and marine environments. It will have a capacity of 700 MW (equivalent to the power used by 450,000 homes).	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the proposed EirGrid Plc) are not likely to occur.
Youghal Landfill (W0068-03)	Cork County Council	Youghal Landfill at Youghal Mudlands, Youghal Landfill is operated by Cork County Council and is authorised to accept up to 170,000 tonnes of waste per annum, including 128,000 tonnes of municipal waste. Youghal, Cork (W0068-03) is an Industrial Emissions (IE) licensed landfill facility located 427m north of the WwTP and ca. 1.5km north (and upstream) of Dunn's Park outfall pipe.	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to Youghal Landfill) are not likely to occur.
ERAS ECO Ltd (W0211-02)	ERAS ECO Limited	Eras Em Limited facility is licenced to carry on the following activities:- 11.1 The recovery or disposal of waste m a facility, within the meaning of the Act	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at

Reference No.	Projects	Project Summary	Cumulative Impacts Assessment
		of 1996, which facility is connected or associated with another activity specified in this Schedule in respect of which a licence or revised licence under Part IV is in force or in respect of which a licence under the said Part is or will be required, & 11.4 (b) Recovery, or a mix of recovery and disposal, of non-hazardous waste with a capacity exceeding 75 tonnes per day involving one or more of the following activities, (other than activities to which the Urban Waste Water Treatment Regulations 2001 (SI No.254 of 2001) apply): (i) biological treatment; (ii) pre-treatment of waste for incineration or co-incineration. (c) Notwithstanding clause (b), when the only waste treatment activity carried out is anaerobic digestion, the capacity threshold for that activity shall be 100 tonnes per day. ERAS ECO Ltd. at Foxhole, Youghal, Cork (W0211-02) is an IE licensed industrial facility, located 480m north of the WwTP and 1.40km south (and upstream) of Dunn's Park outfall pipe	Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the ERAS ECO Limited facility) are not likely to occur.
Technicolour Home Entertainment Services Ireland Limited (P0151-02)	**Kodak Cork Limited**	Technicolour Home Entertainment Services Ireland Limited is an Integrated Pollution Control (IPC) licence facility located at Foxhole Industrial Estate, Youghal, Cork (P0151-02) which is licensed for Surface Coatings. This facility is located 620m north of the WwTP and 1.6km south (and upstream) of Dunn's Park outfall pipe.	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the

Reference No.	Projects	Project Summary	Cumulative Impacts Assessment
			Technicolour Home Entertainment Services Ireland Limited facility) are not likely to occur.
Ashleigh Farms (Waterford) Limited (P0651-01-)	**Ashleigh Farms (Waterford) Limited**	Ashleigh Farms (Waterford) Limited is located in Waterford and is an IPC licence facility which carries out the following activity; the rearing of pigs in installations, whether within the same complex or within 100 metres of that complex, where the capacity exceeds 1,000 units on gley soils or 3,000 units on other soils and where units have the following equivalents: 1 pig = 1 unit, 1 sow = 10 units. Ashleigh Farms (Waterford) Limited is located in Waterford and is 3.7km southeast of the WwTP and 3km southeast of Dunn's Park outfall pipe.	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the Ashleigh Farms (Waterford) Limited) are not likely to occur.
D0176 Lismore SW001	Lismore Agglomeration Wastewater Treatment	Primary discharge	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the Lismore SW001) are not likely to occur. The AECOM (2023) Youghal Marine Modelling Study Addendum considered this discharge and concluded that '*the Youghal*

Reference No.	Projects	Project Summary	Cumulative Impacts Assessment
			WwTP, operating at the design capacity of 16,000 PE and discharging through the Dunn's Park outfall, will not adversely impact: • *The current WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies.* • *The bathing water quality at the beaches (Youghal Front Strand and Claycastle).* • *The water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay'.*
D0176 Lismore SW002	Lismore Agglomeration Wastewater Treatment	Storm Water Overflow	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the Lismore SW002) are not likely to occur. The AECOM (2023) Youghal Marine Modelling Study Addendum considered this discharge and concluded that '*the Youghal WwTP, operating at the design capacity of 16,000 PE and discharging through the Dunn's Park outfall, will not adversely impact:* • *The current WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies.*

Reference No.	Projects	Project Summary	Cumulative Impacts Assessment
			• *The bathing water quality at the beaches (Youghal Front Strand and Claycastle).* • *The water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay'.*
D0272 Cappoquin SW001	Cappoquin Agglomeration Wastewater Treatment	Primary discharge	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the Cappoquin SW001) are not likely to occur. The AECOM (2023) Youghal Marine Modelling Study Addendum considered this discharge and concluded that '*the Youghal WwTP, operating at the design capacity of 16,000 PE and discharging through the Dunn's Park outfall, will not adversely impact:* • *The current WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies.* • *The bathing water quality at the beaches (Youghal Front Strand and Claycastle).* • *The water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay'.*

Reference No.	Projects	Project Summary	Cumulative Impacts Assessment
D0272 Cappoquin SW004	Cappoquin Agglomeration WasteWater Treatment	Discharge from the IDA Park	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the Cappoquin SW004) are not likely to occur. The AECOM (2023) Youghal Marine Modelling Study Addendum considered this discharge and concluded that '*the Youghal WwTP, operating at the design capacity of 16,000 PE and discharging through the Dunn's Park outfall, will not adversely impact:* • *The current WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies.* • *The bathing water quality at the beaches (Youghal Front Strand and Claycastle).* • *The water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay'.*
D0272 Cappoquin SW005	Cappoquin Agglomeration Wastewater Treatment	Storm Water Overflow	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases

Reference No.	Projects	Project Summary	Cumulative Impacts Assessment
			will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the Cappoquin SW005) are not likely to occur. The AECOM (2023) Youghal Marine Modelling Study Addendum considered this discharge and concluded that '*the Youghal WwTP, operating at the design capacity of 16,000 PE and discharging through the Dunn's Park outfall, will not adversely impact:* • *The current WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies.* • *The bathing water quality at the beaches (Youghal Front Strand and Claycastle).* • *The water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay'.*
D0272 Cappoquin SW006	Cappoquin Agglomeration Wastewater Treatment	Storm Water Overflow	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP.

Reference No.	Projects	Project Summary	Cumulative Impacts Assessment
			Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the Cappoquin SW006) are not likely to occur. The AECOM (2023) Youghal Marine Modelling Study Addendum considered this discharge and concluded that '*the Youghal WwTP, operating at the design capacity of 16,000 PE and discharging through the Dunn's Park outfall, will not adversely impact:* • *The current WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies.* • *The bathing water quality at the beaches (Youghal Front Strand and Claycastle).* • *The water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay'.*
D0139 Youghal SW002	Youghal Agglomeration Wastewater Treatment	Storm Water Overflow from Greenpark Pumping Station	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the Youghal SW002) are not likely to occur. The AECOM (2023) Youghal Marine Modelling Study Addendum considered this discharge and concluded that '*the Youghal WwTP, operating at the design capacity of 16,000 PE and*

Reference No.	Projects	Project Summary	Cumulative Impacts Assessment
			discharging through the Dunn's Park outfall, will not adversely impact: • *The current WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies.* • *The bathing water quality at the beaches (Youghal Front Strand and Claycastle).* • *The water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay'.*
D0139 Youghal SW005	Youghal Agglomeration WasteWater Treatment	Storm Water Overflow from Front Strand Pumping Station	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the Youghal SW005) are not likely to occur. The AECOM (2023) Youghal Marine Modelling Study Addendum considered this discharge and concluded that '*the Youghal WwTP, operating at the design capacity of 16,000 PE and discharging through the Dunn's Park outfall, will not adversely impact:* • *The current WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies.* • *The bathing water quality at the beaches (Youghal Front Strand and Claycastle).*

Reference No.	Projects	Project Summary	Cumulative Impacts Assessment
			• *The water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay'.*
D0139 Youghal SW006	Youghal Agglomeration WasteWater Treatment	Storm Water Overflow from Greenpark Pumping Station	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the Youghal SW006) are not likely to occur. The AECOM (2023) Youghal Marine Modelling Study Addendum considered this discharge and concluded that '*the Youghal WwTP, operating at the design capacity of 16,000 PE and discharging through the Dunn's Park outfall, will not adversely impact:* • *The current WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies.* • *The bathing water quality at the beaches (Youghal Front Strand and Claycastle).* • *The water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay'.*
D0139 Youghal SW008	Youghal Agglomeration	Emergency Overflow from Foxhole Pumping Station	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under

Reference No.	Projects	Project Summary	Cumulative Impacts Assessment
	WasteWater Treatment		discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the Youghal SW008) are not likely to occur. The AECOM (2023) Youghal Marine Modelling Study Addendum considered this discharge and concluded that '*the Youghal WwTP, operating at the design capacity of 16,000 PE and discharging through the Dunn's Park outfall, will not adversely impact:* • *The current WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies.* • *The bathing water quality at the beaches (Youghal Front Strand and Claycastle).* • *The water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay'.*

Reference No.	Projects	Project Summary	Cumulative Impacts Assessment
D0139 Youghal SW010	Youghal Agglomeration WasteWater Treatment	Storm Water Overflow from Summerfield Pumping Station	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the Youghal SW010) are not likely to occur. The AECOM (2023) Youghal Marine Modelling Study Addendum considered this discharge and concluded that '*the Youghal WwTP, operating at the design capacity of 16,000 PE and discharging through the Dunn's Park outfall, will not adversely impact:* • *The current WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies.* • *The bathing water quality at the beaches (Youghal Front Strand and Claycastle).* • *The water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay'.*
Aquaculture Site ID T05-482A	Aquaculture Licence	7.47 ha Farm for Pacific Oysters	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases

Reference No.	Projects	Project Summary	Cumulative Impacts Assessment
			will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the Aquaculture Site ID T05-482A) are not likely to occur. Based on the findings of the Marine Modelling Study prepared by AECOM Youghal WwTP, operating at the design capacity of 16,000PE and discharging through the Dunnes Park outfall, will not adversely impact the '*WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies, the bathing water quality at the beaches (Youghal Front Strand and Claycastle) and the water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay*' (AECOM, 2023).
Aquaculture Site ID T05-395	Aquaculture Licence	11.24 ha Farm for Pacific Oysters and Manila Clams	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the Aquaculture Site ID T05-395) are not likely to occur. Based on the findings of the Marine Modelling Study prepared by AECOM Youghal WwTP, operating at the design capacity

Reference No.	Projects	Project Summary	Cumulative Impacts Assessment
			of 16,000PE and discharging through the Dunnes Park outfall, will not adversely impact the '*WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies, the bathing water quality at the beaches (Youghal Front Strand and Claycastle) and the water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay'* (AECOM, 2023).
Aquaculture Site ID T05-491A	Aquaculture Licence	13.97 ha Farm for Pacific Oysters and Blue Mussels	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the Aquaculture Site ID T05-491A) are not likely to occur. Based on the findings of the Marine Modelling Study prepared by AECOM Youghal WwTP, operating at the design capacity of 16,000PE and discharging through the Dunnes Park outfall, will not adversely impact the '*WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies, the bathing water quality at the beaches (Youghal Front Strand and Claycastle) and the water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay'* (AECOM, 2023).

Reference No.	Projects	Project Summary	Cumulative Impacts Assessment
Aquaculture Site ID T05-517A	Aquaculture Licence	Application for an Oysters, Mussels and Shellfish farm.	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the Aquaculture Site ID T05-517A) are not likely to occur. Based on the findings of the Marine Modelling Study prepared by AECOM Youghal WwTP, operating at the design capacity of 16,000PE and discharging through the Dunnes Park outfall, will not adversely impact the '*WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies, the bathing water quality at the beaches (Youghal Front Strand and Claycastle) and the water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay'* (AECOM, 2023).
Aquaculture Site ID T05-517B	Aquaculture Licence	Application for an Oysters, Mussels and Shellfish farm.	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational

Reference No.	Projects	Project Summary	Cumulative Impacts Assessment
			plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the Aquaculture Site ID T05-517B) are not likely to occur. Based on the findings of the Marine Modelling Study prepared by AECOM Youghal WwTP, operating at the design capacity of 16,000PE and discharging through the Dunnes Park outfall, will not adversely impact the '*WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies, the bathing water quality at the beaches (Youghal Front Strand and Claycastle) and the water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay*' (AECOM, 2023).
Aquaculture Site ID T05-468A	Aquaculture Licence	Application for a Mussels and Shellfish farm.	The Dunn's Park discharge outfall is currently operational as a temporary discharge location from Youghal's WwTP under discharge licence Reg No. D0139-01. The existing outfall at Dunn's Park, discharges treated effluent into the Lower Blackwater Estuary / Youghal Harbour. There are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. The operational phase of the project will involve continued operation of the Dunn's Park discharge outfall from Youghal's WWTP. There are no changes to existing operational plant items, buildings or operational hours within the existing WwTP. Taking into account the location, nature and scale of the project, significant cumulative environmental effects (with respect to the Aquaculture Site ID T05-468A) are not likely to occur. Based on the findings of the Marine Modelling Study prepared by AECOM Youghal WwTP, operating at the design capacity of 16,000PE and discharging through the Dunnes Park outfall, will not adversely impact the '*WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies, the bathing water*

Reference No.	Projects	Project Summary	Cumulative Impacts Assessment
			quality at the beaches (Youghal Front Strand and Claycastle) and the water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay or the aquaculture sites within Youghal Harbour and Youghal Bay' (AECOM, 2023).

13.3.1. Landscape and Visual

The list of possible projects as detailed in Chapter 13 of this report which could have potential cumulative effects has been considered. There would be no significant cumulative landscape or visual effects resulting solely from the interaction of the project with other recent or proposed developments as detailed in Chapter 13 of this report.

13.3.2. Air Quality, Odour and Climate

The cumulative effects of the project in conjunction with current and future developments in the vicinity of the subject site are considered in this section.

Air, Odour, and Climate were assessed against the projects listed in Table 13.1 of Section 13. This table contains relevant projects that have planning permissions as well as nearby EPA licence sites and developments.

The most relevant nearby sites are the Waste Transfer Station (Licence Reg W0211-02) and Youghal Landfill (Licence Reg W0068-03). These sites are located north of the site approximately 427m from the closest site boundary. These sites may emit odour into the environment; however, these facilities are located predominantly downwind of the WwTP and at a distance which is unlikely to lead to measurable cumulative impacts.

The construction of dwellings, a solar farm, and electricity developments will not have a measurable cumulative impact on air and climate. The combined emissions and effects from these activities are expected to be minimal and not significantly contribute to changes in air quality or climate.

The construction of dwellings, a solar farm, and electricity developments do not contribute to odour emissions, so these additional developments will not have any cumulative impact on odour associated with the WwTP.

There will be no significant adverse air quality, climate, or odour impacts on the receiving environment as a result of the project or in conjunction with other local developments that are planned for the area.

13.3.3. Noise & Vibration

13.3.3.1. Construction Phase

There is no construction phase associated with the project, hence the effect is neutral. In the event that construction works are occurring at other permitted or proposed developments in the area, any construction noise levels at NSLs will be specific to the project at hand and will not result in any cumulative noise effect with the project.

13.3.3.2. Operational Phase

The operational phase of the project is determined to be of neutral, imperceptible and long term noise effect. The baseline noise survey has measured the cumulative noise levels associated with the operation of the existing Youghal WwTP and Dunn's Park discharge outfall in addition to the surrounding noise sources which include road traffic, existing retail, industrial and commercial activities and environmental noise sources including bird song, leaf rustle etc. As discussed in previous sections, there are no planned changes to the existing operations of the WwTP or Dunn's Park discharge outfall, hence no change in the existing noise environment will occur.

Table 13.1 is Section 13 includes all identified projects with potential for cumulative effects. These projects have been reviewed for noise and it is confirmed there are no cumulative noise effects with the proposed project. The following project in the immediate vicinity that has been granted consent but has not yet been built have been reviewed and the potential for cumulative effects commented on.

Application	Description	Status	Distance from the project	Potential for cumulative effect
Ref: 204407 Power Capital Renewable Energy Limited	A 10 year planning consent for a 2.57ha extension to the solar PV farm permitted under Cork County Council planning consent reference number 17/05245 and will involve the incorporation of a 2.2 ha portion of the field to the north east of the permitted site on which	Granted	~300m to WwTP ~1.2km to Dunn's Park Discharge Outfall	Operation of WwTP and Dunn's Park Discharge Outfall inaudible at closest NSLs and operational noise level <20 dB at closest NSLs does not affect the background noise environment. Specific noise level from solar farm development at common NSLs will not

	approximately 5,016 additional photovoltaic panels			result in any significant cumulative noise level.

13.3.4. Land, Soils & Geology

A review of all relevant projects (committed developments, consented projects, granted / approved developments, and projects applied for relevant consents, and licensed and permitted projects), as listed within Table 13.1 (Cumulative Impacts Assessment of Projects) of Chapter 13 has been undertaken. No significant cumulative effects are likely. The proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall will not act in combination with other project (listed in Table 13.1.) to result in any predicted cumulative effects on the land, soils and geology are predicted. Therefore no significant cumulative effects are likely.

13.3.5. Traffic

Based on the review conducted on the relevant projects (committed developments, consented projects, granted / approved developments, and projects applied for relevant consents, and licensed and permitted projects) listed within Table 13.1 (Cumulative Impacts Assessment of Projects) of Chapter 13, it has been observed that no significant cumulative effects are expected. The analysis suggests that the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall will not combine with other projects listed in Table 13.1 to result in any predicted cumulative effects on the local road network. As a result, it is concluded that no significant cumulative effects are likely to occur.

13.3.6. Cultural Heritage

A review of all relevant projects (committed developments, consented projects, granted / approved developments, and projects applied for relevant consents, and licensed and permitted projects), as listed within Table 13.1 (Cumulative Impacts Assessment of Projects) of Chapter 13 has been undertaken. It is concluded that the proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge location outfall will not have the potential to act in combination with other project (listed in Table 13.1) to result in any likely cumulative effects on the cultural heritage resource. Therefore, no significant cumulative effects are likely.

13.3.7. Population and Human Health

A review of all relevant projects (committed developments, consented projects, granted / approved developments, and projects applied for relevant consents, and licensed and permitted projects), as listed within Table 13.1 (Cumulative Impacts Assessment of Projects) of Chapter 13 has been undertaken. No significant cumulative effects are likely. The proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall will not act in combination with other project (listed in Table 13.1.) to result in any predicted cumulative effects on the population and human health are predicted. Therefore no significant cumulative effects are likely.

13.3.8. Biodiversity

A summary of all committed development in the immediate environs of the project, which have been approved by Cork County Council and an Bord Pleanála (ABP) within the last 5 years have been reviewed as part of the preparation of this EIAR, along with committed developments, consented projects, granted / approved developments, and projects applied for relevant consents, and licensed and permitted projects. Table 13.1 presents a summary of cumulative effects that might arise from Consented Projects.

From a biodiversity perspective, the most relevant project are applications for a solar farm in the Mudland immediately to the north of the WwTP: -

1. 175245; "*Construction of an up to 5MW solar PV farm, with an export capacity of 4MW, comprising approximately 14,000 no. photovoltaic panels on ground mounted galvanized steel frames within a site of 5.44ha and all associated development including; 4 no. transformer stations, 4 no. auxiliary transformer stations, 4 no inverters, 1 no. client side substation, 1 no. single storey storage building, 1 no. single storey communications building, 1 no. single storey DNO substation building, 3 no. CCTV security*

cameras mounted on 4m high poles, upgraded vehicular access from the public road, site access gate, perimeter security fencing (2m high)".
This was granted permission in February 2018 and is located to the north of the WwTP.

2. 204407; "*A 10 year planning permission for a 2.57ha extension to the solar PV farm permitted under Cork County Council planning permission reference number 17/05245 and will involve the incorporation of a 2.2 ha portion of the field to the north east of the permitted site on which approximately 5,016 additional photovoltaic panels on ground mounted galvanised steel frames will be installed. Associated works proposed include; 1 no CCTV security camera mounted on 4m high pole, internal access roads and perimeter security fencing (2m high). In addition, an alternative grid connection to the previously permitted on-site grid connection is proposed involving a connection to the existing Foxhall ESB substation and associated works via the R634 and private lands. A Natura Impact Statement will be submitted to the planning authority with the application*".
This was granted permission in January 2021.

There is no spatial overlap between the proposed solar farm and the current project. No residual effect to terrestrial ecology / biodiversity are predicted to result from the use of the Dunn's Park discharge outfall on a permanent basis. In the absence of any such impacts, no significant cumulative effects are likely to terrestrial ecology / biodiversity are predicted to occur.

13.3.9. Water

The residual effect to surface water / transitional water quality resulting from the use of the Dunn's Park discharge outfall as the primary outfall, on a permanent basis, will be negative, not significant and long-term. Any effects to surface water receptors identified as part of the water assessment will likely be not significant and long-term. A review of all relevant consented projects, as listed within Table 13.1 (Cumulative Impacts Assessment of Projects) of Chapter 13 has been undertaken. Further, based on the findings from the AECOM Youghal Marine Modelling Study Addendum 2023 it is concluded that the Youghal WwTP, operating at the design capacity of 16 000PE and discharging through the Dunns Park outfall, will not adversely impact:

- The current WFD status of the Lower Blackwater M Estuary or Youghal Harbour waterbodies.
- The bathing water quality at the beaches (Youghal Front Strand and Claycastle).
- The water quality of the Designated Shellfish Water (Ballymacoda), the SPFA Classified Production area in Youghal Bay; or the aquaculture sites within Youghal Harbour and Youghal Bay.

No significant cumulative effects are likely.

13.3.10. Material Assets

The cumulative effects consider the impacts of other projects, listed in Table 13.1, which have been cumulatively assessed. The proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge outfall will not act in combination with other project (listed in Table 13.1.) to result in any predicted cumulative effects on the built services and waste management are predicted. Therefore no significant cumulative effects are likely.

With regard to proposed built services and waste management strategies, no potential cumulative effects are anticipated for the project as there are no changes required to the existing infrastructure to facilitate the project, therefore no demolition, construction or decommissioning phases will occur. Therefore the cumulative impacts will have a Neutral and Imperceptible effect.

13.1. Summary

No likely significant effects have been identified as a result of potential cumulative effects between effects identified in the technical chapters of the EIAR and other developments.

Furthermore, in most cases such interactions are unlikely to occur.

No significant cumulative effects are likely to arise from the project.

14. Interactions

14.1. Introduction

This chapter describes interactions between effects on different environmental factors. All potential interactions have been addressed as required throughout the EIAR. During the scoping, baseline assessment and impact assessment stages of this report, contributors (as set out in Section 1.4 of the EIAR) have liaised with each other where relevant to ensure that all such potential interactions have been robustly addressed.

14.2. Summary of Interactions

The interactions between each of the topics as discussed within Chapter 3 to Chapter 12 of this EIAR have been considered in order to determine the potential direct and indirect environmental effects, via. various pathways, which could arise as a result of the project. This section of the EIAR has been prepared in accordance with EPA '*Guidelines on the Information to be contained in Environmental Impact Assessment Reports'* (2022) which states the following;

> *'Some topics could be placed under more than one heading, for example, where hydrogeology is a relevant topic it may be relevant under the heading of 'Aquatic Ecology' as well as under 'Water' or 'Ground Water'. Another example would be amenity which may be relevant under 'Population and Human Health' and 'Landscape'. The requirement for the EIAR to consider 'Interactions' addresses this issue by ensuring that effects are cross-referenced between topics, thus avoiding the need to duplicate coverage of such topics'.*

A summary matrix showing significant interaction and interdependencies between environmental attributes specifically in relation to the project is presented in Table 14-1.

Table 14.1 - Summary Interactions Matrix

	Chapter 3 – Landscape and Visual		Chapter 4 – Air Quality, Odour and Climate		Chapter 5 – Noise and Vibration		Chapter 6 – Land, Soil and Geology		Chapter 7 - Traffic		Chapter 8 - Cultural Heritage		Chapter 9 – Population and Human Health		Chapter 10 - Biodiversity		Chapter 11 - Water		Chapter 12 - Material Assets	
	Con.	*Op.*	*Con.*	*Op.*	*Con.*	*Op.*	*Con.*	*Op.*	*Con.*	*Op.*	*Con.*	*Op.*	*Con.*	*Op.*	*Con.*	*Op.*	*Con.*	*Op.*	*Con.*	*Op.*
Chapter 3 – Landscape and Visual			✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗	✗
Chapter 4 – Air Quality, Odour and Climate					✗	✗	✗	✗	✗	✓	✗	✗	✗	✓	✗	✓	✗	✗	✗	✗
Chapter 5 – Noise and Vibration	✗	✗	✗	✗			✗	✗	✗	✓	✗	✗	✗	✓	✗	✓	✗	✗	✗	✗
Chapter 6 – Land, Soil and Geology	✗	✗	✗	✗	✗	✗			✗	✗	✗	✗	✗	✓	✗	✗	✗	✓	✗	✗
Chapter 7 - Traffic	✗	✗	✗	✓	✗	✓	✗	✗			✗	✗	✗	✓	✗	✗	✗	✗	✗	✗
Chapter 8 - Cultural Heritage	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗			✗	✗	✗	✗	✗	✗	✗	✗
Chapter 9 – Population and Human Health	✗	✗	✗	✓	✗	✓	✗	✓	✗	✓	✗	✗			✗	✗	✗	✓	✗	✓
Chapter 10 - Biodiversity	✗	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗			✗	✓	✗	✗
Chapter 11 - Water	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✓	✗	✓			✗	✗
Chapter 12 - Material Assets	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗		

14.3. Landscape and Visual

The proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge location outfall will result in a neutral, long-term effect on landscape and visual receptors and will not have the potential to interact with other disciplines in the EIAR.

14.4. Air Quality, Odour and Climate Change

The main interactions with air quality are in relation to human beings and flora and fauna.

The impact of air quality on human beings living in the area of the project has been addressed above for the operational phase of the project. The impact assessment shows that the air quality effects that will be experienced by human beings in the vicinity of the project are all within the prescribed criteria. This interaction is described as neutral for the operational phase and is quantified as Not Significant.

In relation to the interaction of emissions to atmosphere from the project with flora and fauna, Table 4.3 sets out Air Quality Standards for the protection of vegetation and ecosystems. This is important as the Blackwater River is a special area of conservation, the Blackwater Estuary is a special protection area, and both the Blackwater River and Estuary are a proposed Natural Heritage Area. NOx and SO2 are the relevant pollutants in ecologically sensitive areas. The impact of the emissions is assessed by comparison against the AQS for NOx and SO2 for protection of ecosystems and the relevant critical loads for the habitat. Critical levels and critical loads are a quantitative estimate of an exposure of one or more pollutants below which significant harmful effects on specified sensitive environmental receptors do not occur. The critical level for NOx for ecological sensitive sites, like the special area of conservation of the Blackwater River the special protection area Blackwater Estuary and the proposed Natural Heritage Area of the Blackwater River and Estuary, is 30µg/m3 and for SO2 is 20 µg/m3 expressed as an annual average. There is no potential for emission of NOx or SO2 associated with the project. Any emissions of NOx from the very low traffic levels associated with the project does not exert a measurable influence on air qualities.

This assessment has shown that the emissions generated from the development are very limited and do not have potential to generate a significant adverse impact on the local ecosystems including birdlife and wildlife. Air Quality in the area is good as shown in Section 4.3 and the Air Quality Standards will not be exceeded as a result of the project thereby ensuring that no significant adverse impact on ecosystems arises. This interaction is described as neutral and quantified as Not Significant.

14.5. Noise and Vibration

This chapter has been prepared with interactions from Section 2 (Project Description), Section 7 (Traffic). Information from this chapter is used to inform Section 9 (Human Health) and Section 10 (Biodiversity).

14.6. Land, Soil and Geology

Land, soil and geology attributes interact with other environmental attributes which are summarised as follows: -

- **Population & Human Health** - Potential impacts on the receiving land, soil and geology environment could also impact on human health. However, there are no likely human health risks associated with land, soil and geology resulting from the project. No significant human health effects are likely as a result of the project. Therefore there is no potential for impact when these topics do interact.
- **Water** - Potential impacts on the receiving land, soil and geology environment could also impact hydrology and hydrogeology conditions present. However, the residual effect to land, soil and geology resulting from the use of the Dunn's Park discharge outfall as the primary outfall, on a permanent basis, will be neutral, imperceptible and long-term. Therefore there is no potential for impact when these topics do interact.

14.7. Traffic

Traffic attributes interact with other environmental attributes which are summarised as follows: -

- **Population & Human Health** - Potential impacts on the receiving traffic environment could also impact on human health. However, there are no likely human health risks associated with traffic resulting from the project. No significant human health effects are likely as a result of the project. Therefore there is no potential for impact when these topics do interact.

- **Noise and Vibration** - Potential impacts on the receiving traffic environment could also impact noise and vibration conditions present. However, the residual effect to traffic resulting from the use of the Dunn's Park discharge outfall as the primary outfall, on a permanent basis, will be neutral, imperceptible and long-term. Therefore there is no potential for impact when these topics do interact.
- **Air Quality, Odour and Climate** - Potential impacts on the receiving traffic environment could also impact air quality, odour and climate conditions present. However, the residual effect to traffic resulting from the use of the Dunn's Park discharge outfall as the primary outfall, on a permanent basis, will be neutral, imperceptible and long-term. Therefore there is no potential for impact when these topics do interact.

14.8. Cultural Heritage

The proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge location outfall will result in a neutral, imperceptible, long-term effect on the cultural heritage resource and will not have the potential to interact with other disciplines in the EIAR.

14.9. Population & Human Health

Population and Human Health attributes interact with other environmental attributes which are summarised as follows: -

Air Quality & Climate - Potential impacts on the receiving air quality and climate environment could also result in associated human health impacts. *'This assessment has shown that the emissions generated from the development are very limited and do not have potential to generate a significant adverse impact on the local ecosystems including birdlife and wildlife. Air Quality in the area is good as shown in Section 4.3 and the Air Quality Standards will not be exceeded as a result of the project thereby ensuring that no significant adverse impact on ecosystems arises. This interaction is described as neutral and quantified as Not Significant'.*

Noise & Vibration - Potential impacts on the receiving noise and vibration environment could also result in associated human health impacts. However, the residual effect to noise and vibration resulting from the use of the Dunn's Park discharge outfall as the primary outfall, on a permanent basis, will be neutral, imperceptible and long-term. Therefore there is no potential for impact when these topics do interact.

Land, Soils & Geology - Potential impacts on the receiving land, soils and geology environment could also result in associated human health impacts. However, the residual effect to land, soil and geology resulting from the use of the Dunn's Park discharge outfall as the primary outfall, on a permanent basis, will be neutral, imperceptible and long-term. Therefore there is no potential for impact when these topics do interact.

Traffic - Potential impacts on the traffic could also result in associated human health impacts. However, the residual effect to traffic resulting from the use of the Dunn's Park discharge outfall as the primary outfall, on a permanent basis, will be neutral, imperceptible and long-term. Therefore there is no potential for impact when these topics do interact.

Water - Potential impacts on the receiving water environment could also result in associated human health impacts. However, no human health risks associated with potential exposure to contaminants (via. surface water / transitional water or groundwater pathways) resulting from the project are likely. No significant human health effects (via. water) are likely as a result of the project. Therefore there is no potential for impact when these topics do interact.

14.10. Biodiversity

Generally speaking, during a project there would be interactions between Biodiversity and Landscape (Chapter 3.0). The baseline biodiversity of a site and its environs would help to inform the design of sustainable landscape proposals and planting schemes, while maximising opportunities for biodiversity gain. However, in this project there are no physical works and hence no new proposed planting schemes to be implemented which would offer such opportunities or which could interact with Biodiversity.

Furthermore, as no works are proposed no noise or air quality impacts arising from the project that might affect Biodiversity are predicted.

The main interaction comes from the discharge from Dunn's Park Outfall and the potential for impacts on water quality. However, as noted below, the residual effect to surface water / transitional water quality resulting from the use of the Dunn's Park discharge outfall as the primary outfall, on a permanent basis, will be negative,

imperceptible and long-term. Any effects to surface water receptors identified as part of the water assessment will likely be neutral. Therefore there is no potential for impact when these topics do interact.

14.11. Water

Water attributes interact with other environmental attributes which are summarised as follows: -

- **Population & Human Health** - Potential impacts on the receiving hydrology and hydrogeology environment could also impact on human health.

  There are no demolition, construction or decommissioning phases associated with the project. Taking account of the baseline environmental setting and the nature, scale and location of the project, any human health effects to onsite or offsite receptors as a result of surface water / transitional water effects will be imperceptible. No human health risks associated with potential exposure to contaminants (via. surface water / transitional water or groundwater pathways) resulting from the project are likely. No significant human health effects (via. water) are likely as a result of the project.
- **Biodiversity** - Potential impacts on the receiving hydrology and hydrogeology environment could also impact on biodiversity conditions present. However, the residual effect to surface water / transitional water quality resulting from the use of the Dunn's Park discharge outfall as the primary outfall, on a permanent basis, will be negative, imperceptible and long-term. Any effects to surface water receptors identified as part of the water assessment will likely be neutral. Therefore there is no potential for impact when these topics do interact.
- **Land, Soils & Geology** - Potential impacts on the receiving hydrology and hydrogeology environment could also impact on land, soils and geology conditions present. However, the residual effect to surface water / transitional water quality resulting from the use of the Dunn's Park discharge outfall as the primary outfall, on a permanent basis, will be negative imperceptible and long-term. Therefore there is no potential for impact when these topics do interact.

14.12. Material Assets

The proposed use of the temporary discharge outfall, Dunn's Park, as a permanent discharge location outfall will result in a neutral, imperceptible, long-term effect on the material assets and will not have the potential to interact with other disciplines in the EIAR.

15. Schedule of Environmental Commitments

All mitigation and monitoring commitments detailed within this EIAR have been included in a separate compendium and are presented in Table 15-1 below. Together these tables form the Schedule of Environmental Commitments which will be implemented as required during the operational phase of the project.

Table 15.1 - Schedule of Environmental Commitments – Mitigation Measures (Operational Phase)

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Operation Phase
NIS (UE, 2023)	To ensure continued satisfactory operation of the Youghal WwTP in line with the discharge licence the authors recommend the following (UE, 2023): • Ensure that the capacity of the WwTP is not exceeded; • Ensure all discharges continue to operate in compliance with the ELVs/ relevant SWO guidelines; and, • Continue monitoring the effluent and receiving waters, on a consistent and regular basis.	

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