



Greater Dublin Drainage Project Addendum

Engineering Design Report Addendum

Uisce Éireann

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Acronym	Description
ABP	An Bord Pleanála
CCHP	Combined Cooling, Heat and Power
CEMP	Construction Environmental Management Plan
cfu	colony forming units
<i>E. coli</i>	<i>Escherichia coli</i>
EDR	Engineering Design Report
EIAR	Environmental Impact Assessment Report
FCC	Fingal County Council
m	metres
MCC	Motor Control Centre
ml	millilitres
NFS	North Fringe Sewer
NIS	Natura Impact Statement
RBSF	Regional Biosolids Storage Facility
SHC	Sludge Hub Centre
SUDS	Sustainable urban drainage systems
UV	Ultraviolet
WwTP	Wastewater Treatment Plant

1. Introduction

An Bord Pleanála (ABP) previously made a decision to grant the planning application for the Greater Dublin Drainage Project (hereafter referred to as the Proposed Project) by Order dated 11 November 2019 under reference number ABP-301908-18. That decision was quashed by Order of the High Court and the case was remitted by that Court to ABP for a fresh determination. Following the remittal Order, ABP decided that given the passage of time since the submission of the original planning application, and in accordance with Section 37F(1)(c) of the Planning and Development Act 2000 (as amended), Uisce Éireann should have the opportunity to update, where appropriate, the Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS), and any other information submitted.

We have reviewed the original Engineering Design Report (hereafter referred to as the original EDR) included as a standalone document in the 2018 planning application, in the light of:

- Changes to the baseline environment; and
- Changes to the law, policy, and industry standards and guidance, in the intervening period.

In so far as relevant to this Addendum, Uisce Éireann has also had regard to the information presented at the Oral Hearing for application ABP-301908-18 and the High Court proceedings in respect of that application, including the addition of ultraviolet (UV) treatment and the River Mayne Culvert extension, such that the Proposed Project description has been updated.

Table 1.1 includes a summary of the project elements which were incorporated into the planning design for the Proposed Project following direction at the Oral Hearing in 2019 and the subsequent planning conditions applied to the 2018 planning application submission. A full description is included in the Chapter 4A (Description of the Proposed Project) in Volume 2A Part A of the EIAR Addendum. The remaining elements of the Proposed Project included in the 2018 planning application remain unchanged.

Table 1.1: Updated Proposed Project Elements

Updated Element	Outline Description of Updated Element
UV Treatment	<ul style="list-style-type: none">• UV Treatment is to be included in the treatment process at the proposed wastewater treatment plant (WwTP) in the northern section of the WwTP site.• The UV treatment system will be designed for the expected flows at the plant and will be installed on the final effluent line. UV treatment will be in operation 24 hours a day, 365 days a year.• The UV system will consist of a minimum of three and a maximum of four treatment units located below or partially below ground level with an above-ground Motor Control Centre (MCC) (in a kiosk) along with minor maintenance and control equipment (e.g. shut-off button, frame for supporting, retracting and cleaning of UV lamps etc.).
River Mayne Culvert Extension	<ul style="list-style-type: none">• Extension of the River Mayne Culvert on the proposed access road to the WwTP by 4m (from 21m to 25m) to cater for the full width of the future north south link road.

This Addendum to the Engineering Design Report (hereafter referred to as the Addendum EDR) addresses the updated elements to the proposed infrastructural requirements of the Proposed Project and supports the planning application remittal.

1.1 Site Location

There are no changes to the proposed site location. Therefore, there are no changes to the information presented in this Section of the original EDR in the 2018 planning application.

1.1.1 Abbotstown Pumping Station

There are no changes to the proposed Abbotstown pumping station site location. Therefore, there are no changes to the information presented in this Section of the original EDR in the 2018 planning application.

1.1.2 Orbital Sewer

There are no changes to the proposed orbital sewer route location. Therefore, there are no changes to the information presented in this Section of the original EDR in the 2018 planning application.

1.1.3 Diversion of North Fringe Sewer

There are no changes to the proposed diversion of the North Fringe Sewer (NFS) location. Therefore, there are no changes to the information presented in this Section of the original EDR in the 2018 planning application.

1.1.4 Wastewater Treatment Plant & Sludge Hub Centre

There are no changes to the proposed Wastewater Treatment Plant (WwTP) and Sludge Hub Centre (SHC) site location. Therefore, there are no changes to the information presented in this Section of the original EDR in the 2018 planning application.

1.1.5 Outfall Pipeline

There are no changes to the proposed outfall pipeline route location. Therefore, there are no changes to the information presented in this Section of the original EDR in the 2018 planning application.

1.1.6 Regional Biosolids Storage Facility

There are no changes to the proposed Regional Biosolids Storage Facility (RBSF) site location. Therefore, there are no changes to the information presented in this Section of the original EDR in the 2018 planning application.

1.2 Site Topography

There are no changes to the site topography for any element of the Proposed Project. Therefore, there are no changes to the information presented in this Section of the original EDR in the 2018 planning application.

1.3 Supporting Information

This Addendum EDR supports the planning application remittal and is itself supported by the Addendum to the Planning Drawings, the Addendum to the Outline Construction Environmental Management Plan (CEMP), and Chapter 4A (Description of the Proposed Project) in Volume 2A Part A and associated figures in Volume 5A of the EIAR Addendum, which are included in the Addendum pack.

2. Detail of the Proposed Project

2.1 Proposed Abbotstown Pumping Station

There are no changes to the design of the proposed Abbotstown pumping station. Therefore, there are no changes to the information presented in this Section of the original EDR in the 2018 planning application.

2.2 Proposed Orbital Sewer

There are no changes to the design of the proposed orbital sewer route. Therefore, there are no changes to information presented in this Section of the original EDR in the 2018 planning application.

2.3 Proposed North Fringe Diversion Sewer

There are no changes to the design of the proposed diversion of the NFS. Therefore, there are no changes to the information presented in this Section of the original EDR in the 2018 planning application.

2.4 Proposed Wastewater Treatment Plant and Sludge Hub Centre

The only update to the proposed WwTP design, since the 2018 planning application submission, is the inclusion of UV treatment. It was agreed as part of the Oral Hearing process for the Proposed Project in 2019 that additional treatment which would take the form of UV treatment would be provided at the proposed WwTP at Clonshagh (Clonshaugh).

UV light technology has been developed over the last 30 years to provide UV disinfection for both water and wastewater. It is a mature technology that is used worldwide (with more than 10,000 installations) to meet water quality objectives in receiving waters. In WwTPs, banks of UV emitting bulbs are provided in units depending on the flow. These units are designed to provide hydraulic residence time for the effluent to be irradiated by UV light of the particular wavelengths necessary to achieve a design reduction in bacteria numbers. These UV systems are designed specifically for each WwTP to achieve a reduction in the *Escherichia coli* (*E. coli*) concentration levels (measured in colony forming units (cfu)) at the point of discharge which is appropriate to the designation of the waters (e.g. bathing / shellfish), the distance of the discharge from the designated receiving waters, the local current and tidal system, and the total volume and flow rate that effluent is discharged from the WwTP.

Typically, with secondary wastewater treatment, the discharge concentrations of coliforms in the effluent are variable and are dependent on the combined or otherwise nature of the sewerage network, the organic load to the WwTP, the flow on any given day, the temperature, and the residence time in the WwTP. Water quality modelling undertaken in advance of, and during the Oral Hearing for the Proposed Project, confirmed that the combination of these factors provided equal time for uptake / accumulation and the subsequent clearance / removal of any coliforms by the shellfish. As such, it was concluded that there was no predicted impact on the shellfish water quality as a result of the Proposed Project and that the Proposed Project would not lead to a deterioration in water quality within the Shellfish Protected Area. However, having regard to submissions made by Fingal County Council (FCC) and members of the public, including relevant fishermen, it was determined that, as an abundance of caution to ensure the protection of the shellfish waters, additional treatment would be applied to the effluent prior to discharge.

It was subsequently agreed as part of the Oral Hearing process that this additional treatment would take the form of UV treatment at the proposed WwTP located at Clonshagh. UV treatment of the final effluent will be incorporated into the proposed WwTP to provide a further reduction in the *E. coli* concentrations and further protection to the designated shellfish waters.

The UV treatment system proposed at the WwTP will be designed and operated to achieve a maximum of 20,000 cfu/100ml (millilitres), with an average concentration in the order of 5,000 to 6,000 cfu/100ml, in the final effluent. At this concentration, there will be no impact on the designated shellfish water. The inclusion of the proposed UV treatment system at the proposed WwTP will provide a combined 99.9% *E. coli* reduction across the entire proposed WwTP (cumulation of primary, secondary, and tertiary treatment processes).

UV treatment will also reduce and control the spikes and variability of the concentrations of *E. coli* discharged from the proposed WwTP, thus providing greater protection to the receiving waters.

The UV system will control photo-reactivation (i.e., the process whereby bacteria recover after being inactivated by UV light in the presence of daylight), as the UV treatment reduces the ability of bacteria to photo-reactivate. Furthermore, at the proposed WwTP, the final effluent will not be exposed to daylight for approximately four hours after the UV treatment due to the length of the proposed outfall pipeline route. This will further inhibit the photo-reactivation process.

UV treatment requires the use of additional energy resources. The best practice approach for UV disinfection of wastewater is to use dynamic dosing. Dynamic dosing adapts the application of UV depending on the characteristics of the effluent, including total suspended solids (including metals) and turbidity, thereby continuously providing a sufficient dose while minimising energy usage. This process is controlled by an energy management system and such a system will be incorporated.

The UV system will include automatic cleaning as well as additional stand-by units to facilitate continued operation of the proposed WwTP during maintenance. Instruments will be installed to continuously monitor the UV dose being applied to the final effluent in accordance with performance requirements. This will facilitate additional cleaning or bulb replacement as required. In addition, regular inspections of the UV system will be completed.

The proposed UV treatment system will be designed for the expected incoming flows to the proposed WwTP and will be installed on the final effluent line. UV treatment will be in operation all-year-round. Accordingly, the proposed UV treatment will have no impact on the operational capacity of the proposed WwTP. The UV system will consist of a minimum of three and a maximum of four treatment units located below, or partially below, ground level with an above-ground motor control centre (MCC) (in a kiosk) along with minor maintenance and control equipment (e.g. shut-off button, frame for supporting, retracting and cleaning of UV lamps etc.). The indicative location of the UV treatment system within the proposed WwTP site is included in Addendum Planning Drawing Number 32102902-2120 which is included in the Addendum pack.

2.5 Proposed Outfall Pipeline

There are no changes to the design of the proposed outfall pipeline route. Therefore, there are no changes to the information presented in this Section of the original EDR in the 2018 planning application.

2.6 Proposed Regional Biosolids Storage Facility

There are no changes to the design of the proposed RBSF. Therefore, there are no changes to the information presented in this Section of the original EDR in the 2018 planning application. Please also refer to the Addendum to the RBSF Engineering Design Report which is included in this Addendum pack.

3. Access and Internal Roads

There are no changes to the information presented in relation to the access and internal roads in this Section of the original EDR in the 2018 planning application. However, there will be an extension to the River Mayne Culvert proposed under the access road to the proposed WwTP off the R139 Road.

As a result of discussion and engagement during the Oral Hearing process, a change was proposed to the River Mayne Culvert and this was confirmed in the initial grant of permission issued for the Proposed Project in 2019.

Condition 13 (c) of ABP's initial grant of permission issued in November 2019 stated that:

'the developer shall increase the width of the culvert at the crossing of the River Mayne as part of the Clonshaugh site entrance, to cater for the full width of the future north south link road'.

The culvert will be extended by 4m, from the original 21m presented in the 2018 planning application to 25m, in order to meet the requirements of Condition 13 (c). The proposed culvert extension remains within the planning boundary submitted in 2018 and is presented in Addendum Planning Drawing Numbers 32102902-2148 and 32102902-2149 which are included in the Addendum pack.

4. Earth Works

There are no changes to the information in relation to earth works presented in this Section of the original EDR in the 2018 planning application.

5. Water Supply

There are no changes to the information in relation to water supply presented in this Section of the original EDR in the 2018 planning application.

6. Surface Water

During the Construction Phase, there will be no changes to the management of surface water runoff during construction activities, in accordance with the Outline Surface Water Management Plan, which is included in Appendix 3 to the Outline CEMP in the 2018 planning application, as supplemented by the Addendum to the Outline Surface Water Management Plan.

The design for surface water management has remained unchanged since the 2018 planning application. Some additional surface water drainage pipes may be required to service the UV treatment process building within the proposed WwTP. However, there will be no change to the volume of surface water runoff, as a result of the UV treatment process building, as this area was previously hardstanding in the 2018 planning application.

7. Foul Sewage

There are no changes to the information in relation to foul sewage presented in this Section of the original EDR in the 2018 planning application.

8. Utility Connections

There are no changes to the information presented in relation to utility connections in this Section of the original EDR in the 2018 planning application.

9. Sustainability

9.1 Sustainable Urban Drainage

There are no changes to the proposed sustainable urban drainage (SUDS) design for the Proposed Project. Therefore, there are no changes to the information presented in this Section of the original EDR in the 2018 planning application.

9.2 Materials Re-use

There are no changes to the proposed reuse of materials, as presented in this Section of the original EDR in the 2018 planning application. Materials will be tested and reused where possible on-site.

9.3 Energy Efficient Design

Proposed amendments to the Energy Performance of Buildings Directive by way of Revised Directive 2023/1791 came into effect on 10 October 2023 which are aimed at ensuring buildings are categorised as zero-emission buildings by 2030 for new builds and 2050 for existing buildings. There are no changes to the remaining information in this Section of the original EDR in the 2018 planning application. As before, this update will be considered at the next phase of the design of the Proposed Project.

9.4 Energy Recovery and Reuse

Since the submission of the original EDR in the 2018 planning application, FCC published the Fingal Development Plan 2023–2029 (FCC 2023). Policy PM30 of the previous Fingal Development Plan 2017–2023 (FCC 2017) noted in this Section of the original EDR in the 2018 planning application has been replaced by Policy IUP34 of the Fingal Development Plan 2023 – 2029, and states that FCC will:

'Promote the use of district heating systems at appropriate locations in new residential and commercial developments where such development does not have a negative impact on the surrounding environment, landscape, biodiversity or local amenities and support complementary technologies including combined cooling, heat and power (CCHP), large scale heat pumps, and

renewable energy opportunities, including geothermal energy, energy from waste, biomass and bio-gas’.

The design of the Proposed Project to maximise energy recovery from the WwTP and sludge treatment processes has not changed since the submission of the 2018 planning application, and therefore, continues to support this updated Policy.

There are no changes to the remaining information in this Section of the original EDR in the 2018 planning application.

10. Construction Quality Assurance

There are no changes to the information in relation to Construction Quality Assurance presented in this Section of the original EDR in the 2018 planning application.

11. References

(FCC 2017). Fingal Development Plan 2017 - 2023

(FCC 2023). Fingal Development Plan 2023 – 2029

Directives and Legislation

Energy Performance of Buildings Directive

Planning and Development Act 2000 (as amended)