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Witness Statement for Greater Dublin Drainage Oral Hearing

1 INTRODUCTION

- 1.1 I am Head of Asset Management at Irish Water and I have been in that role since February 2016.
- 1.2 I am a Chartered Civil Engineer with 26 years' experience. I have extensive experience in the management of large-scale, high expenditure complex contracts involving water, wastewater, buildings and roads in both the private and public sectors. I have worked in Local Authorities as a Senior Executive Engineer on the drainage systems in South Dublin County Council, and as Senior Engineer in Water and Wastewater in Carlow County Council. I have worked in Irish Water as Asset Programmes Manager with responsibility for the development and delivery of capital programmes. I am currently Head of Asset Management with responsibility for strategic national water and wastewater asset management, including responsibility for the delivery of the national 25 year Water Services Strategic Plan (**WSSP**).

2 POLICY CONTEXT

- 2.1 In January 2014, Irish Water assumed statutory responsibility for the provision of public water services from Local Authorities as set out in the Water Services Act 2007. These responsibilities include for "the provision, operation or maintenance of sewers and waste water collection and treatment facilities".
- 2.2 Section 18 of the Water Services Act 2017 provides for the issuing of a Water Services Policy Statement (**Policy Statement**) by the Minister for Housing, Planning and Local Government.

Such a policy was published by the Minister in May 2018 and is focussed on three key themes:

1. Quality;
2. Conservation; and
3. Future proofing.

The Policy Statement has taken full account of existing policy and regulatory documents including the River Basin Management Plan for Ireland 2018-2021, the National Planning Framework and the National Development Plan 2018-2027 under Project Ireland 2040.

Among the priority objectives set for Irish Water in the Policy Statement are the following:

“Bring and maintain public water and wastewater services to acceptable international benchmarks, verified by independent monitoring and reporting. A vital measure for improving raw water quality is increased wastewater treatment, where the focus will be on ensuring full compliance with the Urban Waste Water Treatment Directive and wastewater licencing requirements”

and

“Implementation of the National Planning Framework (NPF) requires that plans for public and private water services are aligned with the broad strategic aims of the Framework, which means:

- Ensuring the growth of our five cities of Dublin, Cork, Galway, Waterford and Limerick, together with the regional centres identified in the NPF, is supported by the provision of water services investment”;

2.3 The Water Services Strategic Plan (WSSP) is Irish Water's strategic national plan for the delivery of water and wastewater services over the next 25 years. The WSSP was developed following two phases of public consultation and underwent a Strategic Environmental Assessment (SEA) and an Appropriate Assessment (AA). The final WSSP was approved by the relevant Minister in October 2015. Existing plans, such as the Greater Dublin Strategic Drainage Strategy (GDSDS) and its SEA, were reviewed by Irish Water in framing the WSSP. I deal with the GDSDS and its SEA in more detail below.

2.4 Irish Water's overall strategic objectives are set out in the WSSP and are consistent with the Water Services Policy Statement and require Irish Water to;

- Provide effective management of wastewater,
- Protect and enhance the environment
- Support social and economic growth; and
- Invest in our future.

The proposed project is necessary to deliver on the following specific objectives contained in the WSSP, namely:

- to manage the operation of wastewater facilities in a manner that protects the environment (WW1);
- to manage the availability and resilience of wastewater services now and into the future (WW2);
- to manage the reliability of wastewater services (WW3); and
- to facilitate growth in line with national and regional economic spatial and planning policy (SG2).

- 2.5 Irish Water is also required to deal with the treatment and disposal of wastewater sludge and our strategy in this matter is set out in our National Wastewater Sludge Management Plan (**NWSMP**), which was the subject of a Strategic Environmental Assessment and extensive public consultation and was adopted in September 2016.
- 2.6 The NWSMP outlines Irish Water's strategy to ensure a nationwide, standardised approach for managing wastewater sludge over the next 25 years.
- 2.7 A national approach will ensure that, for the first time, treated wastewater sludge across the country is effectively managed, stored, transported and disposed of, or reused in a sustainable way, to the benefit of the public and the environment. The NWSMP makes the point that the use of Sludge Hub Centres (**SHCs**) backed by Satellite Dewatering Sites allows for economies of scale and greater flexibility in the selection of sludge treatment processes, particularly energy recovery. It also highlights the fact that quality control over the outputs from any sludge treatment process is improved using this system and is also used internationally.
- 2.8 Key actions proposed within the NWSMP included that the location of hubs be considered on a regional basis, rather than a county basis, which will maximise the use of energy recovery where possible, and that the preferred option for reuse of treated wastewater sludge is on land.
- 2.9 The NWSMP provides a summary of the current SHC status. Within this, it is clear that the proposal in relation to Fingal involved the development of a sludge hub as part of the proposed WwTP, reflected in Table 3 (Summary of the Recommended Hub Centres and Satellites in County Sludge Management Plans) of the NWSMP. The proposed SHC will have the capacity to provide sustainable treatment for municipal wastewater sludge and domestic septic tank sludges generated in Fingal. The proposed SHC will provide advanced anaerobic digestion treatment to the sludge and domestic septic tank sludges to produce a 'biosolid' end-product suitable for reuse in agriculture, with the biogas produced during the treatment process used

on-site for energy recovery. The 'biosolid' produced will be transported to the proposed Regional Biosolid Storage Facility (RBSF) for seasonal storage.

- 2.10 The purpose of the proposed RBSF is to store treated biosolids that will be produced at the Ringsend WwTP and the proposed WwTP. The NWSMP (Irish Water, 2016) identifies reuse of treated wastewater sludge (biosolids) as a fertiliser on agricultural land as the preferred outlet in the short to medium term. The proposed RBSF will be used solely for storage purposes. No treatment of the biosolids will take place at the proposed RBSF.
- 2.11 In summary, Irish Water has a statutory obligation and a policy direction to deliver wastewater treatment, compliant with environmental standards, so as to meet both current and forecasted demand. That in turn ensures the growth and development of our cities and the Proposed Project caters for the Greater Dublin Area to a design horizon of 2050.

3 THE NEED FOR THE PROPOSED PROJECT

- 3.1 Wastewater treatment forms an essential part of the primary infrastructure network that is necessary for communities to form, grow and thrive. Currently, 1.9 million people or 40% of Ireland's population live and work in the Greater Dublin Area.
- 3.2 The population of the Greater Dublin Area is projected by the ESRI to increase by approximately 450,000 to 2.35 million persons in the period to 2040. Project Ireland 2040 projects that an additional 143,000 homes will be needed in Dublin by 2040.
- 3.3 As our population and economy grow, so too does the volume of wastewater. The amount of wastewater generated in the Greater Dublin Area is projected to increase by more than 50% in the period to 2050. Irish Water is working to upgrade our existing wastewater treatment facilities and to invest in new infrastructure in order to meet this increased demand. The proposed project is vital to deliver the required wastewater treatment capacity and infrastructure to:
- safeguard public health;
 - protect and improve the environment; and
 - facilitate the sustainable residential and commercial development of north Dublin and the wider region. ,

Greater Dublin Strategic Drainage Study

- 3.4 The Proposed Project has its origins in the Greater Dublin Strategic Drainage Study, (GDSDS) which was a major region-wide strategic study conducted between 2001 and 2005 to examine and report on the medium- and long-term urban drainage needs. The GDSDS was

commissioned as a result of the broadening gap between the developing load in the Greater Dublin Area and the maximum load which can be delivered to and treated at the existing Wastewater Treatment Plants (WwTPs) in the catchment and primarily at Ringsend Wastewater Treatment Plant.

- 3.5 In order to address this, the GDSDS Final Strategy Report (Dublin Drainage Consultancy 2005) made detailed recommendations on wastewater infrastructure requirements, which included the optimisation of the capacity of existing WwTPs and networks for near-term requirements, coupled with the development of new infrastructure to meet growth in the medium- and long-term.
- 3.6 The key findings of the GDSDS were the subject of an SEA, which was completed by Fingal County Council in 2008. The SEA endorsed the fundamental concept and scale of the GDSDS Final Strategy Report but cautioned that site selection needed to take place in a process of the rigorous appraisal of alternatives. The key recommendations of the SEA were as follows:
- The upgrade of all WwTPs in the region, including Ringsend, to their ultimate capacity; and
 - Construction of a new Regional WwTP, associated orbital sewer route and outfall pipeline route (land based section and marine section) in the northern part of the GDA.
- 3.7 The SEA considered that, if the above proposed drainage strategy was not implemented, inadequate wastewater treatment and drainage management would result in development constraints within the area covered by the strategy. Thus, Local Authorities would be inhibited from effectively implementing their respective Development Plans.
- 3.8 The GDSDS determined that the 2002 wastewater load, in terms of combined residential population, commercial, institutional and industrial sources, exceeded the installed wastewater treatment capacity in the GDA at that time. Furthermore, it determined that, even with the expansion of each of the existing WwTPs to their ultimate design capacity, the projected combined growth (residential population, commercial, institutional and industrial sources) in the GDA would exceed the treatment capacity provided by the existing WwTPs.
- 3.9 The GDSDS also concluded that the ability to expand the treatment capacity at each of the WwTPs beyond their ultimate design capacity was limited by either site and/or receiving water constraints at each WwTP. It also found that there was limited capacity in the existing drainage networks to accept flows from future development, noting significant overloading of sewers, deficiencies at combined sewer overflows and increased risk of sewer flooding throughout the network. Constraints on further upgrade works to address these capacity issues, particularly in the network serving Ringsend, include the intensity of urban development, associated

utilities and traffic. Considering the scale of the network upgrade work required, the GDSDS described these works as representing:

'a major engineering challenge, particularly where large diameter pipelines have to be constructed in roadways already saturated with utility services and traffic. Even with tunnel construction, the accommodation of shafts and protection of existing works, traffic management and general management of environmental impacts would be extremely difficult' (Dublin Drainage Consultancy 2005).

- 3.10 Following from the above analysis, the GDSDS concluded that additional wastewater treatment capacity was required.
- 3.11 As the largest future treatment capacity deficit was predicted at Ringsend WwTP, it was determined that the provision of additional wastewater treatment capacity would require the construction of a new wastewater treatment facility for the contributing catchment to Ringsend WwTP, to augment the treatment capacity provided at Ringsend WwTP.

Review of Projected Future Organic Load on Wastewater Treatment Plants

- 3.12 The Proposed Project was commenced under the stewardship of Fingal County Council and Irish Water took over responsibility for its development and delivery in 2014.
- 3.13 The Ringsend Upgrade Project and the GDD Project, together with the other strategies proposed by GDSDS to meet the GDA drainage infrastructural requirements, at the 2011 and 2031 design horizons, were predicated on population projections baselined on the 2002 Census, with non-domestic and trade effluent data built up from considerations of sub-catchment planning potential. It was therefore considered necessary by Irish Water to re-examine population and load projections within the Greater Dublin Area to assess whether the recommendations of the GDSDS and its SEA remained valid.
- 3.14 A 'Demographic Study' (AOS Planning 2014) was commissioned by Irish Water in May 2014. The objective of this study was to examine a range of population projections out to 2050. The study sets out regional population projections for the planning regions and the State to 2050. The projections were prepared as per the last census for the base year 2011, with projections for the years 2021, 2026, 2031, 2041, 2046 and 2050. Years 2031 and 2046, respectively, represent the furthest dates used for the CSO regional and State population projections. This study was updated to reflect the National Planning Framework in 2018.
- 3.15 The results from the 2016 Census were reviewed and assessed to update the population and load projections and to re-baseline the proposed growth projections to 2016 data. The 2013 updates by the Central Statistics Office (CSO) of the Population and Labour Force Projections,

2016 – 2046 (CSO 2013a) and the Regional Population Projections 2016 - 2031 (CSO 2013b) were reviewed in relation to population growth rates in the GDA, with particular emphasis on the contributing catchment to Ringsend WwTP.

- 3.16 The findings of the Proposed Project review of population and load projections are reported in the Assessment of Domestic and Non-Domestic Load Report (Jacobs Tobin 2017). That report verified the conclusions of the GDSDS. Future wastewater treatment requirements, defined on a WwTP catchment basis rather than administrative boundaries within the GDA, were estimated for three design scenarios: 2016, 2025 and 2050, now described. The first scenario (2016) represents the re-defined baseline or existing situation for the Proposed Project. The second scenario (2025) corresponds to the planning horizon when it is anticipated that the Proposed Project will be commissioned. The third scenario (2050) represents a long-term horizon appropriate for the planning of major strategic infrastructure based on the anticipated commissioning date of the Proposed Project.

Existing Loading and Projected Treatment Capacity Requirements

- 3.17 Organic load on WwTPs arises from residential population, commercial, institutional and industrial sources. This load is generally measured as kilograms (kg) of Biochemical Oxygen Demand (BOD) per day and expressed in terms of population equivalent (PE), with 1 PE equal to 60g BOD per day. Each element of load is discussed in the following paragraphs.

Residential Population

- 3.18 Existing population figures have been derived from the 2016 Census.
- 3.19 Three future population growth scenarios with respect to the Proposed Project have been adopted based on the assumption scenarios in the WSP Demographic Study (AOS Planning 2014) and the CSO (2013b) Projections. The three growth scenarios are outlined below, with further details available in the Assessment of Domestic and Non-Domestic Load Report (Jacobs Tobin 2017):
- Growth Scenario 1 – Planned 'Low' (equivalent to CSO 'M2F21 Recent' Scenario);
 - Growth Scenario 2 – Planned 'High' (equivalent to CSO 'M2F2 Traditional' Scenario); and
 - Growth Scenario 3 – 'Most Likely' (equivalent to CSO 'M2F2 Modified' Scenario).

¹ M= net migration
F= Total fertility rate
2= scenario 2
(CSO 2013a)

- 3.20 For each of the three growth scenarios, annual average growth rates, derived from CSO Regional Population Projections and the WSP Demographic Study population projections, have been examined for each of the catchment areas. These growth rates have been adopted for the Proposed Project to develop population projections out to 2050.

Industrial

- 3.21 Industrial discharges are licensed under either an Industrial Emissions Licence with the Environmental Protection Agency (EPA) as the competent authority or a trade effluent discharge licence issued by Irish Water. The quality and quantity of these discharges are regularly monitored by the licensing authority.
- 3.22 The proposed design capacity of the Proposed Project makes provision for industrial discharges on the following basis:
- Existing industrial load to remain unchanged out to the 2050 Design Year; and
 - In accordance with the WSSP (Irish Water 2015), a headroom allowance of 20% of the sum of the residential and commercial loads is provided in the design, from which capacity can be made available for future industrial loads.

Commercial/Institutional

- 3.23 The existing load contribution from commercial and institutional sources (e.g. shops, offices, schools) has been estimated as follows:
- Where the complete catchment to a WwTP is being considered, the commercial and institutional load contribution has been estimated by deducting the known population and industrial loadings from the measured BOD load at the WwTP; and
 - Where individual sub-catchments are being considered, the commercial and institutional load contribution has been assumed as 16% of the population load. This relationship has been used extensively in the estimation of flow and load for design purposes and is widely accepted at a local and national level in Ireland (Department of Environment, Heritage and Local Government 2004).
- 3.24 Future commercial and institutional loadings are assumed to grow in line with population growth.

Combined Loadings

- 3.25 The combined existing loadings and future projected treatment capacity requirements in each catchment for the three growth scenarios examined are summarised in Table 3.3 of Chapter 3 in Volume 2 Part A of the Environmental Impact Assessment Report (EIAR).
- 3.26 Examination of Table 3.3 indicates that, even with all the WwTPs upgraded to their ultimate design capacity, the projected future total treatment capacity requirement in these catchments will exceed the combined total installed design capacity between 2025 and 2031 (dependent on actual growth realised). Specifically, the table indicates that the predicted future wastewater treatment capacity deficit in the study area will be concentrated at the following plants:
- Ringsend WwTP (as upgraded): capacity deficit arising c. 2025; and
 - Leixlip WwTP (as upgraded): capacity deficit arising between 2016 and 2025.
- 3.27 As further expansion of Ringsend and Leixlip WwTPs beyond their ultimate design capacity is not possible as a result of site constraints in the case of Ringsend and receiving water constraints in the case of Leixlip, additional wastewater treatment capacity is required to cater for these catchments.
- 3.28 The predicted future wastewater treatment capacity deficit is concentrated on the Ringsend catchment. The additional wastewater treatment required is most effectively provided by the construction of a single new WwTP, i.e. the proposed WwTP element of the Proposed Project, to augment the treatment capacity provided by Ringsend WwTP. A single new WwTP offers significant environmental and economic benefits over multiple smaller plants particularly in the area of odour control, sludge treatment and transport and energy recovery. To achieve this additional treatment capacity, it is necessary to divert flow and load out of the Ringsend catchment to the new proposed WwTP. The proposed WwTP will cater for the projected growth in the Ringsend catchment, inclusive of the planned flow transfer from Leixlip WwTP, out to the design year horizon of 2050.
- 3.29 The review of projected treatment capacity requirements undertaken for the Proposed Project has therefore confirmed the key recommendations of the GDSDS and its SEA, and verified the need for the Proposed Project as part of an overall increase in wastewater capacity in the GDA to meet current and expected future demand.

4 FINANCING

- 4.1 The projected budget for the GDD project is in the region of €500 million. The delivery of the GDD project is a key strategic investment priority under the National Development Plan 2018-2027, and is an objective of the Regional Planning Guidelines and the Fingal Development Plan 2017-2023. The Irish Water Strategic Funding Plan 2019-2024 lays out the arrangements

that Irish Water proposes to make and the measures that are proposed between 2019 and 2024 to implement the objectives of the Water Services Strategic Plan.

- 4.2 In circumstances where this project has been approved by the Boards of Irish Water and its parent company Ervia as an urgent priority, sufficient resources will be available in a timely fashion to finance the proposed acquisition of these lands, permanent wayleaves, permanent rights of way, temporary working areas and the implementation of the Proposed Project.

5 CONCLUSION

- 5.1 The proposed project will provide the additional treatment capacity required once the Ringsend facility reaches its maximum capacity in the mid-2020s and will support the sustainable growth of the GDA up to 2050. The new regional plant is required to divert load away from the Ringsend facility, alleviate pressure on the wastewater network and support the long-term sustainable growth of the wider Dublin region.
- 5.2 The Proposed Project will provide additional waste water capacity of 500,000 population equivalent in the GDA i.e waste water capacity up to 2050, in a manner compliant with EU water standards. This has just been a brief overview of key issues of the Proposed Project including the policy and statutory context for the project and the project need
- 5.3 Irish Water firmly believes that the proposed project is the optimum solution, from a technical, environmental, social and economic perspective, to meeting Dublin's wastewater treatment requirements. It is needed to unlock essential residential, commercial and community development in the Greater Dublin Area, while maintaining and enhancing the inland and coastal amenities so valued by the community.