UISCE ÉIREANN : IRISH WATER

Greater Dublin **Drainage Project**

Environmental Impact Assessment Report

Volume 1
Non-Technical Summary

JACOBS® TOBIN Consulting Engineers

Greater Dublin Drainage Project

Irish Water

Environmental Impact Assessment Report: Volume 1 of 6

Non-Technical Summary

June 2018

Preface

This document is the Non-Technical Summary (NTS) of the Environmental Impact Assessment Report (EIAR) for the Greater Dublin Drainage Project (referred to as the Proposed Project throughout this NTS).

The planning application and the Environmental Impact Assessment Report and Natura Impact Statement may be inspected free of charge or purchased on payment of a specified fee (which fee shall not exceed the reasonable cost of making such copy) during public opening hours at the following locations:

- The Offices of An Bord Pleanála, 64 Marlborough Street, Dublin 1 from Thursday 28th June 2018 for a period of 7 weeks until 17th August 2018
- The Offices of Fingal County Council, County Hall; Main Street Swords, Co Dublin, K67 X8Y2 from Wednesday 20th June until 17th August 2018
- The Offices of Fingal County Council, Grove Road, Blanchardstown, Dublin 15, D15 W638; from Wednesday 20th June until 17th August 2018
- The Offices of Dublin City Council, Civic Offices, Wood Quay, Dublin 8, D08 RF3F from Wednesday 20th June until 17th August 2018

The application may also be viewed/ downloaded on the following website: www.gddapplication.ie .

Submissions or observations may be made only to An Bord Pleanála ('the Board') 64 Marlborough Street, Dublin 1 during the above-mentioned period of 7 weeks relating to -

(i) The implications of the proposed development for proper planning and sustainable development, and

(ii) The likely effects on the environment of the proposed development, if carried out.

(iii) The likely adverse effects (if any) on the integrity of a European Site of the proposed development, if carried out

Any submissions/ observations must be accompanied by a fee of €50 (except for certain prescribed bodies) and must be received by the Board not later than 5.30p.m. on the 17th of August 2018. Such submissions/observations must also include the following information:

- The name of the person making the submission or observation, the name of the person acting on his or her behalf, if any, and the address to which any correspondence relating to the application should be sent,
- The subject matter of the submission or observation, and
- The reasons, considerations and arguments on which the submission or observation is based in full (Article 217 of the Planning and Development Regulations refers).

Any submissions or observations which do not comply with the above requirements cannot be considered by the Board.

Non-Technical Summary

This document is the NTS of the EIAR for the Greater Dublin Drainage (GDD) Project (referred to as the Proposed Project throughout this NTS). It is a project to develop a new Wastewater Treatment Plant and associated infrastructure to serve the growing population of the Greater Dublin Area (GDA).

The Proposed Project is required to ensure that there will be sufficient wastewater drainage and treatment capacity to allow for future development in certain parts of the GDA, including residential housing, schools, businesses and industry.

The Proposed Project

The Proposed Project will increase the wastewater drainage and treatment capacity in the GDA, protecting public health, safeguarding the environment and facilitating social and economic growth to 2050 and beyond. The elements of the Proposed Project comprise:

- A new proposed Wastewater Treatment Plant (WwTP) and Sludge Hub Centre on a 29.8 hectare (ha) site at Clonshagh (Clonshaugh);
- A proposed underground orbital sewer (a set of pipes and drains to transfer wastewater) from Blanchardstown to Clonshagh, including a new proposed pumping station (a building containing machinery for pumping wastewater along the orbital sewer) at Abbotstown;
- A proposed sewer to divert part of the North Fringe Sewer (NFS) to the new proposed WwTP;
- A proposed outfall pipeline (a pipe and discharge point of treated wastewater) from the new WwTP to discharge the treated wastewater to the Irish Sea; and
- Regional Biosolids Storage Facility (RBSF) (building(s) where solids created as a result of wastewater treatment which can be reused are stored) to be located on an 11ha site at Newtown, Dublin 11.

The Proposed Project will be able to treat wastewater for an estimated average daily load equivalent to a population of 500,000 people (also referred to as a 'population equivalent') at 2050 and provide sludge treatment for approximately 18,500 tonnes of dry solids per annum at 2050. The proposed RBSF will be able to store 35,400m^3 of biosolids.

The proposed orbital sewer route will divert wastewater from existing and newly developed areas in the north, west and north-west of the Ringsend catchment, including Blanchardstown, Mulhuddart, parts of east Meath and Leixlip. The diversion of part of the existing NFS will divert existing flows from that sewer to the proposed WwTP.

What is Happening Now?

Irish Water is responsible for managing Ireland's water and wastewater investment and maintenance programmes. As part of this, Irish Water is managing the planning application process for the Proposed Project.

The EIAR has been prepared in support of a planning application that has been submitted to the planning authority, An Bord Pleanála.

A period of statutory public consultation is now being carried out by An Bord Pleanála.

What Happens Next?

Irish Water will hold a public procurement process to appoint a contractor to design, build and operate the Proposed Project.

Subject to planning permission being granted, and once the appointed contractor has been selected, the construction process will begin with the proposed RBSF. It is envisaged that this will take approximately 18 to 24 months and will be completed by 2021.

Construction of the proposed WwTP and remaining associated infrastructure is estimated to take three years and will begin (subject to planning permission being granted) in 2021.

It is intended that the Proposed Project and associated infrastructure will become operational from 2025.

Need for the Proposed Project

The Proposed Project has developed as a result of the findings from the Greater Dublin Strategic Drainage Study (GDSDS), which was undertaken to review the wastewater drainage and treatment requirements for the GDA. The GDSDS was commissioned as a result of the increasing gap between the load of wastewater to be treated in the GDA and the maximum load that can be delivered to and treated by the existing WwTPs, primarily the Ringsend WwTP. The outcome of the study was published in the GDSDS Final Strategy Report in April 2005.

The Final Strategy Report determined the level of demand for wastewater treatment within the GDA from all sources, including residential houses, commercial properties, schools and other institutions and industries. A key finding of the Final Strategy Report was that the demand from these sources already exceeded the wastewater treatment capacity at that time.

The Final Strategy Report also projected future growth in the GDA due to further development, and found that the upgrade and expansion of all of the existing WwTPs to their design capacities would not be sufficient to treat all wastewater that would be generated.

The Final Strategy Report concluded that additional treatment capacity would be needed by 2011, and made the following recommendations:

- The upgrade of all existing WwTPs;
- The construction of a large WwTP in north County Dublin discharging into the Irish Sea; and
- An orbital drainage network to divert, either in full or in part, existing wastewater drainage catchments to this proposed WwTP.

These findings were supported by the 2008 Strategic Environmental Assessment (SEA) of the GDSDS, which agreed with the fundamental concept and scale of the recommendations from the Final Strategy Report but noted that site selection for a future WwTP needed to be supported by a rigorous assessment of alternative options.

A review of the projected population growth up to the year 2050 was undertaken in 2017, using figures from the 2016 Census. The revised growth predictions confirmed the findings of the Final Strategy Report: that an upgrade and expansion of the wastewater treatment infrastructure in the GDA is required, including the construction of a new WwTP in north County Dublin and its associated orbital sewer and outfall pipeline.

The need for the Proposed Project is aligned with the strategic objectives outlined in Ireland's first integrated plan for the delivery of water services, produced by Irish Water in February 2015, called the Water Services Strategic Plan. The findings of the GDSDS were reviewed and endorsed during the development of the Water Services Strategic Plan.

Need for the Proposed Regional Biosolids Storage Facility

The purpose of the proposed RBSF is to store biosolids that will be produced by the Proposed Project and at the Ringsend WwTP. The National Wastewater Sludge Management Plan (NWSMP) identifies the preferred reuse of biosolids as a fertiliser on agricultural land in the short to medium term. Constraints on winter land spreading due to legislation and seasonality of demand for the product requires that biosolids must be stored during certain times of the year. The development of regional facilities to cater for storage of biosolids from WwTPs is recommended in the NWSMP.

The proposed RBSF, which forms part of the Proposed Project, is at an 11ha site at Newtown, Dublin 11 and consists of two large biosolids storage buildings, including solar panels on the roof of one building and supporting buildings and works.

Environmental Impact Assessment

Environmental Impact Assessment (EIA) is the process by which an assessment of potential environmental impacts is undertaken. and if the anticipated effects are unacceptable, design measures or other relevant mitigation measures can be taken to reduce or avoid those effects.

The EIAR reports the findings of the EIA carried out on the Proposed Project. The main objectives of the report are to:

- Describe the baseline conditions prior to any work commencing on the Proposed Project;
- Describe the assessment methodologies used to assess the predicted environmental impacts of the Proposed Project;

- Describe environmental issues and any likely significant effects which may arise during the construction and operation of the Proposed Project; and
- Propose measures to mitigate these effects.

This NTS forms Volume 1 of the EIAR and presents a summary of the EIAR, including key aspects of the Proposed Project and the associated beneficial and adverse impacts of importance.

The EIAR documents have been divided subdivided into the following Volumes for ease of use:

- Volume 1: NTS;
- Volume 2 Part A: Introduction;
- Volume 2 Part B: Appendices relevant to Volume 2 Part A;
- Volume 3 Part A: Main Report for the Proposed Project;
- Volume 3 Part B: Appendices relevant to Volume 3 Part A;
- Volume 4 Part A: Main Report for the Proposed Regional Biosolids Storage Facility
- Volume 4 Part B: Appendices relevant to Volume 4 Part A
- Volume 5 Part A: Proposed Project Figures
- Volume 5 Part B: Proposed RBSF Figures; and
- Volume 6: Proposed Project Photomontages

Alternatives Considered

Non-Project Alternatives

The potential for alternative approaches other than the provision of new WwTPs to address the shortfall in wastewater treatment capacity in the GDA was considered as part of the GDSDS.

These alternatives included reducing stormwater and groundwater contributing to the sewer network and upgrading the existing sewer network.

The GDSDS found that these combined alternative approaches would not remove the requirement for additional wastewater treatment capacity through the development of a new wastewater treatment facility.

Proposed Project Alternatives

The Proposed Project has been developed following careful consideration of alternatives. The GDSDS and associated SEA, considered a number of strategic options relevant to the Proposed Project.

These options ranged from the development of a network of small community WwTPs, each discharging to the closest surface or groundwater bodies, to the construction of the a single regional WwTP in North County Dublin. The GDSDS concluded that additional capacity was best provided through the construction of the a single regional WwTP. A single regional WwTP was a better option than a number of smaller sub-regional WwTPs, as a single plant offers the best benefits in terms of planning requirements, the process of obtaining land, costs, flexibility and future operational benefits.

The consideration of options also included a 'do-nothing' scenario. This is a scenario where no further wastewater drainage or treatment capacity would be created in the GDA. This option was determined as to be not suitable, as it would lead to significant environmental, economic and sanitary problems, which in turn would present significant public health risks.

Alternative Site and Route Selection Assessment

In order to identify the best location for the Proposed Project, an Alternative Sites Assessment and route selection process was undertaken in four phases:

Phase 1

- Alternative Sites Identification: This involved the identification of nine land parcels within which the proposed WwTP could be located. It also identified potential pipeline corridors to and from the proposed WwTP, as well as areas for a potential marine outfall to the Irish Sea;

Phase 2

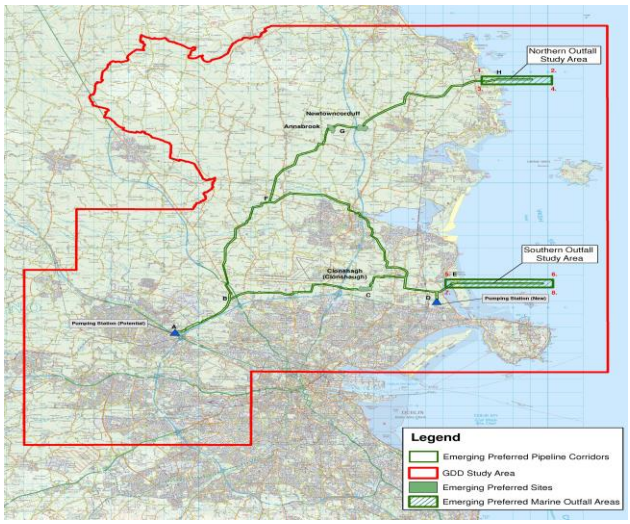
- Alternative Sites Assessment: This consisted of an assessment of the nine land parcels against a range of environmental and technical criteria. This concluded in the identification of the three emerging preferred site options for the proposed WwTP (Annsbrook, Clonshagh (Clonshaugh) and Newtowncorduff) including associated pipeline corridors;

Phase 3

- Consultation Stage: During this phase, the three emerging preferred options identified in Phase 2 were brought through public consultation with an aim to gather any additional information on the three emerging preferred site options; and

Phase 4

- Phase 4 – Selection of the final preferred site and routes, pipeline routes and marine outfall location: This phase incorporated public feedback and focused on things to be considered in the EIAR.



Emerging Preferred Sites, Corridors and Marine Outfall Areas

The progression of the design of the Proposed Project is has been influenced by queries raised during the consultation process. These included:

- Wastewater treatment emission limit standards;
- Potential for reuse of treated wastewater;
- Construction methodologies; and
- Wastewater treatment technologies.

The findings of these assessments have been incorporated into the current specimen design relevant to the Proposed Project.

Alternatives for the Proposed Regional Biosolids Storage Facility

Biosolids from Ringsend WwTP are currently reused as fertiliser on farms. The continuation of that practice has been recommended by Irish Water's NWSMP. Biosolids require seasonal storage as they cannot be landspread all year round. Biosolids from Ringsend WwTP are currently stored at a facility in Thornhill, Co. Carlow. This facility has insufficient capacity to cater for biosolids coming from the proposed Ringsend WwTP, and the Proposed Project.

Upgrade works are also currently proposed for the Ringsend WwTP which would increase the volume of biosolids produced at this facility. These proposed works are currently subject to a separate planning application process, which has been submitted to An Bord Pleanála. Accordingly, a 'Do-Nothing Scenario', in terms of provision of the proposed RBSF is not a viable option.

A wide ranging three-stage site selection process was undertaken within the GDSDS region which led to the selection of the proposed Newtown site for siting the proposed RBSF. A Stage 1 non-statutory consultation on the proposed RBSF site selection methodology was conducted in Quarter (Q)1 2017. A Stage 2 non-statutory consultation was conducted in Q2 2018. This resulted in 5 potential sites being shortlisted, as outlined below

- Bracetown/Gunnocks (Dunboyne, Co. Meath);
- Gunnocks (Dunboyne, Co. Meath);
- Greenogue (Newcastle, Co. Dublin);
- Newtown/Kilshane (Dublin 11); and
- Kilshane, (Dublin 11)

These five potential sites proceeded to a detailed assessment phase (Stage 3) in accordance with a range of environmental, economic & engineering, planning and social & community criteria. The Stage 3 Report considered the observations included in the Stage 2 Report.

The Newtown/Kilshane site (the site now known as Newtown and proposed for the RBSF element of the Proposed Project) emerged as the preferred site based on a cumulative consideration of the classifications.

Scoping and Consultation

Consultation has taken place at key stages throughout the development of the Proposed Project to seek the views of stakeholders on the proposals and, where necessary, to use this feedback to amend the design and help shape the Proposed Project.

Consultation was undertaken with An Bord Pleanála, local Authorities, government departments, semi state organizations, business interest groups, national specialist interest groups, companies, affected landowners and the general public.

From the early stages of site and route selection, consultation was undertaken to gather public opinion on emerging site options for the Proposed Project. This consultation was undertaken in four distinct phases:

Phase 1

- Public Constraints Consultation (May- to June 2011): To seek views on constraints such as designations or protected areas within the initial study area to inform the preliminary screening exercise for the Proposed Project;

Phase 2

- Preliminary Screening Outcomes Consultation: (October to– December 2011): To consult on the outcome of the preliminary screening exercise which shortlisted nine land parcels for the proposed WwTP, transfer pipeline corridors and marine outfall locations;

Phase 3

- Emerging Preferred Site Options Consultation (May- to July 2012): To consult on the three emerging site options, which were Annsbrook, Newtowncorduff and Clonshagh and to assist in gathering any additional information on these options; and

Phase 4

- Preferred Option Consultation (June to August 2013): Announcement of the emerging preferred option for the Proposed Project. Submissions were also invited from the public on issues to be considered in the future EIAR for the Proposed Project.

Irish Water is committed to continuing this engagement with key stakeholders and the public.

Landowner consultation has been a key part of the consultation process and has informed and developed the alignment of the Proposed Project based on direct feedback from landowners. Examples of this include refinement of permanent acquisition areas, changes to construction corridors, and amendments to the actual pipeline route in order to reduce impact to specific landowners.

Scoping is the process by which matters to be considered in the EIAR are identified and confirmed. In the case of the Proposed Project, this was undertaken during Phase 4 of the consultation process.

In addition to members of the public, scoping of the EIAR was undertaken with a range of stakeholders such as LA's (Local Authorities), government departments and semi-state organisations amongst others.

The Proposed Project website (http://www.greaterdublindrainage.com/) will be kept up to date with details from the statutory approvals process, project news, community updates and Press Releases.

Proposed Regional Biosolids Storage Facility

Irish Water undertook a three-stage site selection process to identify a suitable location for the proposed RBSF. At each stage, a period of non-statutory public consultation was arranged as summarised in Table 1.0. A number of open days were held before and after the selection of the preferred site.

Table 1.0: Proposed RBSF Site Selection Consultation Periods

Site Selection Stage	Dates
Stage 1 - Site Selection Methodology	2 February to 2 March 2017
Stage 2 - Identification of Potential Sites	11 May to 15 June 2017
Stage 3 - Identification of Preferred Site	29 August to 10 October 2017

The '*Scoping Report for the EIAR and NIS'* for the proposed RBSF was published in conjunction with the *Stage 3 Report – Identification of Preferred Site* on the

29 August 2017. Opinions were sought on the factors that should be considered and the methodology to be used in assessing the environmental impact of the project. The consultation period took place over six weeks from 29 August to 10 October 2017, at the same time as the Stage 3 site selection consultation.

Copies of the Scoping Report were issued to both prescribed bodies and key stakeholders during the scoping stage of the project and a further public open day was held on 12 September 2017.

Description of the Proposed Project

The location of the Proposed Project is identified in Figure 1 of this NTS and comprises the following elements:

- A regional proposed WwTP to be located on a 29.8 ha site in the townland of Clonshagh;
- A Sludge Hub Centre to treat wastewater sludges, which are a by-product generated as a result of the treatment of wastewater. The Sludge Hub Centre will be co-located at the same site as the proposed WwTP;
- A pumping station to be located in the grounds of the National Sports Campus at Abbotstown;
- An underground orbital sewer from the existing main sewer in Blanchardstown to the proposed Abbotstown pumping station and, from there, on to the proposed WwTP at Clonshagh. In total, approximately 13.7km in length of orbital sewer;
- An odour control unit (OCU) to be located adjacent to the R122 at the interface of the rising main and gravity sewer sections of the orbital sewer.
- A diversion sewer (approximately 600m long), diverting flow from the current NFS to the proposed WwTP;
- An underground outfall pipeline (land based section) consisting of a pipeline (approximately 5.4km) from the proposed WwTP at Clonshagh to Baldoyle;
- An underground outfall pipeline (marine section) (approximately 6.0km) that will run from Baldoyle to its discharge point approximately 1km north-east of Ireland's Eye.
- At its discharge point, the proposed outfall pipeline (marine section) will extend up to sea bed level to discharge the treated wastewater to the Irish Sea; and
- The proposed RBSF to be located on an 11ha site at Newtown, Dublin 11.

The current design is indicative, and will be used by the future contractor to prepare a detailed design for the construction and operation of the Proposed Project.

Proposed Wastewater Treatment Plant

The proposed WwTP will comprise a number of buildings and tanks of different shapes and sizes, partly above and partly below ground. The maximum building height will be 18m above ground. Tanks will all be covered. Typical treatment processes at the site will include:

- Preliminary treatment processes: coarse and fine screens are used to remove paper, plastics, fats, oils, grease, grit and other materials that can be easily removed;
- Primary sedimentation: large tanks where larger solids can settle out by gravity before being removed and transferred for sludge treatment;
- Biological treatment: organic matter in the wastewater is broken down by bacteria with the help of air (aeration). Sludge produced by this process is removed from the tank and transferred for treatment;
- Final settlement: organic matter that was carried over after the biological treatment can settle out before being removed from the tank and transferred for sludge treatment; and
- The final treated wastewater is tested prior to discharge through the proposed outfall pipeline route into the Irish Sea.

Ancillary infrastructure at the site will include control rooms, welfare and administration facilities, and storage facilities.

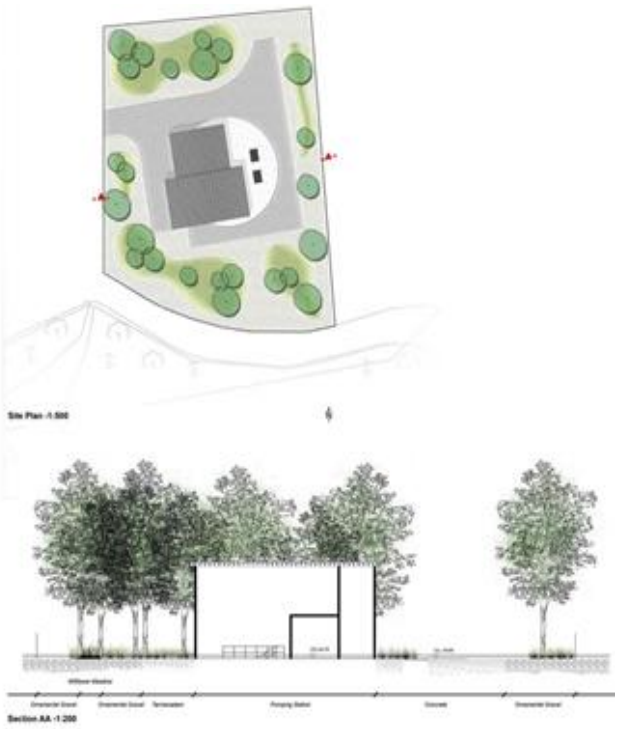
Proposed Sludge Hub Centre

The proposed Sludge Hub Centre will have the capacity to provide sustainable treatment for sludges generated from wastewater treatment in Fingal. Any sludges that have not been generated at the proposed WwTP will be transported to the Sludge Hub Centre by road tanker or covered skips.

Sludges will be treated by a fully enclosed process called 'advanced anaerobic digestion', that which will produce a 'biosolid', suitable for reuse on land, and a biogas which will be recovered for use as an energy source within the proposed WwTP.

Proposed Abbotstown Pumping Station

The proposed Abbotstown pumping station will comprise below-ground structures containing pumps and suction pipework, and above-ground structures to house the control room, welfare facilities, back-up diesel generator, odour and other control equipment and storage facilities.



Proposed Abbotstown Pumping Station

Proposed North Fringe Sewer Diversion Sewer

The NFS diversion sewer will divert wastewater flows from the current NFS for treatment at the proposed WwTP.

The NFS diversion sewer will connect to the current NFS at the junction of the R139 Road and the proposed access road into the proposed WwTP. The NFS diversion sewer will then be routed north along the proposed access road before turning in a westerly direction into the proposed WwTP. The NFS diversion sewer will operate as a gravity sewer from its diversion point along the NFS to the proposed WwTP and will then be pumped using a rising main within the proposed WwTP site.

Proposed Orbital Sewer and Outfall Pipeline Routes

The proposed orbital sewer will operate as a combination of a gravity sewer (where the piping is sloped downwards from the source towards its destination) and a pumped main under pressure (where the wastewater is pumped to its destination).

The proposed outfall pipeline (land based section and marine section) will operate as a pressurised gravity pipeline.

The proposed orbital sewer and outfall pipeline routes will include access chambers, manholes, air valves and scour valves (to enable appropriate maintenance of the pipelines).

A temporary construction corridor will be required for construction of all pipelines. This construction corridor will generally be 40m wide along the pipeline routes (plus additional areas for temporary construction compounds). During the Operational Phase, a wayleave, generally 20m wide, is required for access and maintenance of the pipeline. The construction corridor will be fenced on both sides. The lands within the construction corridor will be treated to return them to the equivalent condition that existed before construction commenced.

Proposed Regional Biosolids Storage Facility

In line with the NWSMP, the purpose of the proposed RBSF is to store treated biosolids on a seasonal basis that will be produced at the Ringsend WwTP and the Proposed Project.

The proposed RBSF is to be constructed at Newtown, Dublin 11. The site comprises approximately 11ha of partially developed land approximately 1.6km north of Junction 5 (Finglas) on the M50 motorway. The facility is designed to meet a 2040 storage target of approximately 35,400m^3, which requires two storage buildings, each 105m long, 15.5m in height, with some small stacks to 18m, and 50m wide.

The development will also require:

- Demolition of existing single storey structures on site, together with the partial removal of existing internal roads and the modification of existing drainage;
- Provision of solar panels on the roof of one building;
- Provision of odour control units, each with 18 m high discharge chimney flues;
- Provision of a control building, a single storey office-type building and associated staff car parking;
- Continued use of the existing vehicular access serving the local road (R135); and,
- Ancillary landscape and site development works.

Construction of the Proposed Project

Construction works for the proposed WwTP, Sludge Hub Centre, RBSF and Abbotstown pumping station will be constructed using conventional construction techniques and involve a range of activities such as ground excavations, construction of foundations and structures, mechanical and electrical fit out, installation of pipework, development of landscape screening berms, construction of access/egress roads, internal circulation roads, car parks, footpaths, landscaping and final planting.

Excavated soils and materials will be reused on site, where possible.

The pipelines will largely be constructed by conventional open-cut excavations which involve stripping of topsoil, excavation of a pipeline trench, placement of bedding material (such as gravel) into the trench, placement of the pipeline, backfilling of the trench with excavated soils, and replacement of the topsoil.

At a number of locations, for example where crossings of significant watercourses, major roads, railways or other infrastructure are required, methods that avoid the excavation of trenches will be used. These 'trenchless' techniques can be referred to as 'micro-tunnelling'.

The micro-tunnelling activities require shafts to be constructed at the start and end of each crossing to install and then recover the micro-tunnelling equipment. This work will take place within temporary construction compounds located in the construction corridor.

The proposed outfall pipeline route (marine section) will be constructed by micro-tunnelling and sub-sea pipe laying (where the pipeline is laid under the seabed).

Micro-tunnelling will be undertaken from the west of the R106 Coast Road to approximately 750m offshore, at a depth of between 15m and 20m below ground level. Sub-sea pipe laying techniques will then be used from the end of the micro-tunnelling section to the final outfall discharge point in the Irish Sea.

This sub-sea pipe laying will involve the excavation of a trench (approximately 5m deep), temporary storage of the excavated materials on the seabed, assembly of the pipe into long sections, placement of the pipe into the trench, and replacement of previously excavated materials around the pipe. At the discharge point, the outfall pipeline will extend up to sea bed level, and diffuser valves will be attached to it, which allow the treated wastewater to achieve the required initial dilution on discharge to the Irish Sea.

Operation of the Proposed Project

The normal operation of the Proposed Project will be fully automated. This will be monitored, controlled and managed from a control centre located at the proposed WwTP, which will be manned 24 hours per day, and 7 days per week, and employ approximately 30 staff.

The proposed WwTP and Sludge Hub Centre will use a combination of electricity and natural gas from the national grid, and electricity and heat generated by a Combined Heat and Power system on-site using the

biogas from the sludge treatment process or mains natural gas.

Power for the proposed Abbotstown pumping station and proposed RBSF will be provided by electricity from the national grid. Back-up diesel generators will also be provided.

Proposed Regional Biosolids Storage Facility

There will be no processes at the proposed RBSF. The main activities will be the delivery, loading/unloading and storage of biosolids all within the storage buildings. There will be no treatment of the biosolids.

Biosolids will be transported to the proposed RBSF from the Ringsend WwTP and the Proposed Project. in articulated trucks with tipping trailers. The trailers each have a capacity of approximately 40m^3. These haulage vehicles, referred to hereafter as Heavy Goods Vehicles (HGVs), are approximately 14m long and have 6 axles. In transporting biosolids to the proposed RBSF, HGVs will operate throughout the year and the generated traffic volumes will be relatively constant.

The transportation of biosolids from the proposed RBSF to spread lands or local storage facilities will be seasonal. The spread lands currently used for application of biosolids produced at the existing Ringsend WwTP are located in South Leinster and parts of Munster. There is currently no proposal to change the location of the spread lands. The peak periods for traffic will be the spring and autumn. Past records from the existing storage facility show that approximately 80% of the total annual trips to spread lands occur during the months of February, March, August and September. The remaining traffic occurs mainly in January, April, May and October. The estimated traffic volumes to the proposed RBSF is provided in Volume 4, Chapter 13.

Environmental Impacts and Mitigation

The EIA process provides a valuable opportunity to reduce potential environmental impacts through design refinement, and this has formed an integral part of the design process for the Proposed Project.

Environmental constraints and issues have been identified through consultation, extensive environmental surveys and technical assessments. The information gathered has informed decision-making throughout the design process, providing opportunities to address potentially significant impacts at an early stage, for example by refinement of pipeline alignment or by the incorporation of mitigation measures into the design.

The EIAR presents the results of the EIA for the Construction Phase and the Operational Phase of the Proposed Project. The design, which has been developed for the Proposed Project, forms the current indicative design of the Proposed Project. This indicative design will be used by the future contractor(s), which will be appointed by Irish Water, to prepare the detailed design for the construction of the Proposed Project. The future contractor delivering the Proposed Project shall address and meet the requirements of the EIAR.

Population and Human Health

The assessment considered the effects on human beings in terms of both population and human health impacts.

Population

The assessment of the potential population impacts of the Proposed Project mainly involved desk-based studies, which were carried out to build profiles of the communities that are likely be impacted. It considered issues related to:

- Population growth;
- Residential and communities;
- Employment and economic activity;
- Cultural heritage, recreation and tourism; and
- Community infrastructure.

The assessment found that positive and negative impacts can be expected as a result of the Proposed Project. Likely negative impacts associated with the Construction Phase include disturbance from noise and dust, road closures or diversions, traffic congestion, disturbance to fishing activities and beach goers, disturbance of recreational facilities and closure of rights of way.

The proposed measures to reduce or eliminate these impacts include:

- Separation of construction of works from the local environment and implementation of safe working practises practices;
- Publication of construction details and advance notification of works for local communities and businesses;
- Appropriate signage in the vicinity of near construction works;
- Implementation of a Construction Traffic Management Plan which will outline the appropriate management of traffic, including construction traffic generated by the Proposed Project during construction;
- Creation of alternative access arrangements for locations where the proposed pipeline crosses roads, where required;
- Provision of alternative temporary recreational facilities at the ALSAA Sports Club and National Sports Campus;
- Appointment of Fisheries Liaison Officers and Community Relations Officers; and
- Appropriate timing of works in the marine environment to avoid potential sailing regattas and race events.

With the implementation of these measures, all potential significant negative impacts will be avoided.

Positive impacts during the Construction Phase will include the generation of employment, both for construction workers and suppliers, with an associated increase in local economic activity due to additional spending by incoming construction workers.

The population impacts will be positive in nature for the Operational Phase of the Proposed Project and will fall into three categories:

- The enabling of future development and population growth in the GDA, and maintenance of the Dublin Region's economic competitiveness;
- By increasing the wastewater treatment capacity in the GDA, the Proposed Project will improve the water quality across the GDA by preventing the potential for discharge of untreated wastewater as a result of overloading the system. This will positively impact water-based amenities such as bathing and fishing; and
- Increased employment, both direct and indirect, as well as increased expenditure in the local area by the new labour force.

Human Health

The overriding purpose of the Proposed Project is to provide a long-term sustainable drainage solution that will cater for existing and future development in the GDA by implementing the key recommendation of the GDSDS. The Proposed Project will ensure that wastewater generated from the continued growth and economic development of the GDA is appropriately treated in order to safeguard human health and the environment and will be carried out in compliance with the relevant EU Directives and national regulations on water quality.

There is potential for socio-economic gain, including economic growth and residential development. Improved socio-economic status is well recognised as resulting in a positive impact on health outcomes. There is the potential for increased employment and reduced unemployment, particularly long-term unemployment. If this is achieved, there will also be benefits in terms of social health, including decreased social inequality.

From a community perspective, there are clear benefits in terms of health protection, opportunities for health improvements and access to services.

There are, however, a limited number of individuals, primarily those living close to the construction of the Proposed Project, for whom there may be Slight adverse impacts in terms of noise and air quality during the Construction Phase. These impacts will be minimised by use of mitigation measures.

Overall, the impacts in relation to human health of the Proposed Project are overwhelmingly positive.

Proposed Regional Biosolids Storage Facility

The assessments confirm that no aspect of the proposed RBSF will give rise to an exceedance of

health-based standards or harmful impacts on human health. The human health assessment identified the need for a pest control plan to be implemented on the site during the construction phase to prevent impacts that could occur if rodents were disturbed during construction works. There are no additional mitigation measures required from a Population or Human Health perspective.

Consequently, the proposed RBSF is not predicted to have any significant negative effects on the local and regional population.

Marine Water Quality

This assessment considered the potential impacts to marine water quality through from the Construction Phase and Operational Phase of the Proposed Project.

The assessment used mathematical modelling to look at the discharge of treated wastewater through the outfall pipeline to the sea. The area of the sea in which the treated wastewater will be discharged to has a water quality which is classified as 'good' to 'high' quality. There are eight stretches of beach in the surrounding area designated as protected bathing water beaches, one of which was awarded Blue Flag status in 2017.

Construction of the outfall pipeline will require dredging (excavation) of a trench approximately 5m deep on the seabed. Potential Construction Phase impacts will be related to the potential release of fine seabed sediment/mud particles into the sea during these construction works.

With the application of international rules for the prevention of pollution from vessels while the pipeline is being laid, there will be no significant remaining impacts during the Construction Phase.

The extensive mathematical modelling undertaken to replicate the Operational Phase shows that, apart from the actual mixing zone of the discharge point, the 'good' status criteria of the sea where the outfall pipeline is will be located, will be maintained, and there will not be an impact on designated shellfish waters, designated bathing waters, nor Blue Flag beaches.

Hydrology and Hydrogeology

The assessment considered the potential impacts on the hydrological (surface water) and hydrogeological (groundwater) environments during the Construction Phase and Operational Phases, through desk based studies, field surveys and questionnaires, and public consultations. The main watercourses relevant to the Proposed Project are:

- Tolka River;
- Santry River;
- Mayne River (and its tributary the Cuckoo Stream); and
- Sluice River.

Tolka River at Abbotstown

There are also a number of other surface water features within the study area such as estuarine areas (Baldoyle Estuary) and groundwater aquifers.

The existing quality of the surface water in the vicinity of near the Proposed Project is generally poor to moderate, with aquifers designated as poor to locally important in terms of their potential ability to produce water.

The assessment found that a number of potential impacts are possible during both the Construction Phase and Operational Phase of the Proposed Project.

During construction, the water quality of some of the watercourses could potentially be affected from surface water runoff containing fine sediments, river crossing activities required for installation of the pipeline, dewatering activities, and accidental spillages and leakages of construction materials.

During operation, potential impacts on the quality of surface water and groundwater are associated with the potential for accidental spillages of wastewater or chemicals, and leakages or pipe bursts.

A number of measures for the Construction Phase and Operational Phase are proposed to reduce or avoid impacts to surface water and groundwater receptors, comprising:

- Careful planning and implementation of best practice measures for the avoidance of pollution and implementation of detailed Pollution Control Plans, Emergency Response Plans and Method Statements;
- Pipeline installation by tunnelling under the five main watercourses identified in Volume 3, Chapter 17 Hydrology and Hydrogeology;
- The placement of barriers along sewers and watercourse crossings to prevent physical damage to the banks and beds of watercourses; and
- The tunnel for the proposed outfall pipeline beneath the Portmarnock peninsula will be in rock, and the area around the tunnel/pipe will be sealed to prevent impacts on groundwater.

The implementation of these measures will result in there being no remaining negative impacts.

Flood risk was also considered within the assessment and concluded that both construction and operation of the proposed WwTP and Abbotstown pumping station will not affect flooding risk, as these elements and temporary construction compounds will be located in an area of low flood risk (referred to as Flood Zone C).

Proposed Regional Biosolids Storage Facility

The assessment considered the impact of the proposed RBSF on the receiving surface water environment in its vicinity.

The assessment was based on a desk study review of hydrological information, site visits, and the Flood Risk Assessment (FRA) provided as part of the planning application. Water quality sampling was undertaken to provide baseline data on the receiving water

A Construction Environmental Management Plan (CEMP) will be implemented to ensure good construction management practices are employed. The construction of the buildings and site contouring will remove localised topographic depressions and mitigate the risk of flooding.

Following the implementation of mitigation measures the residual impacts of the construction and operation of the proposed RBSF will be neutral and imperceptible. No cumulative impacts are predicted. No significant residual impacts are predicted

Biodiversity (Marine)

The assessment considered the potential impacts on the flora and fauna found on the sea bed, marine mammals, marine birds, fish, plankton and water quality during the Construction Phase and Operational Phases.

A number of specialist surveys have been carried out to establish the current state of the marine environment within and adjacent to the Proposed Project. These surveys included walkovers, sea bed ecological surveys, seabed shape and feature studies, underwater noise monitoring, direct and remote surveys of underground features, water quality sampling and bird surveys.

There are nine European protected sites within 10km of the Proposed Project. European protected Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) within 5km of the Proposed Project include:

- Baldoyle Bay;
- Howth Head;
- Malahide Estuary;

- North Dublin Bay;
- Ireland's Eye;
- Rockabill to Dalkey Island; and
- North Bull Island.

Along with the EIAR, a Natura Impact Statement (NIS) has been carried out in line with the requirements of the European Union (EU) Habitats Directive to assess potential negative impacts on European sites in the vicinity of the Proposed Project.

Bottlenose dolphins (picture courtesy of Irish Whale and Dolphin Group/John Daly)

The key sources of potential impacts to marine flora and fauna during construction are:

- Surface runoff and/or construction waste entering into the estuary;
- Construction noise;
- Release of compressed air;
- Spillage of drilling mud;
- Sea bed disturbance from dredging;
- Movement of sea bed sediment; and
- Disturbance from vessel traffic.

The following mitigation measures, based on best environmental practices, will be put in place to reduce Construction Phase impacts:

- Noise screening;
- Timing works to minimise impact on wintering birds;
- Installation of the proposed outfall pipeline route (marine section) beneath Baldoyle Bay using tunnelling techniques;
- Timing dredging activities to coincide with tides;
- Establishment of safe zones around works to protect ecological features;
- Restricting noisy works if sensitive mammals are spotted in the area; and
- Implementation of a Vessel Management Plan to ensure that sensitive features and sites are not impinged upon by construction works.

With the effective implementation of these measures, no significant remaining negative impacts are anticipated.

Computer modelling of the discharge of treated wastewater from the marine discharge point showed that there will be no impact on marine flora or fauna.

Grey seal (picture courtesy of Simon Berrow)

Biodiversity (Terrestrial and Freshwater Aquatic)

The assessment considered the potential impacts of the Proposed Project on terrestrial flora and fauna during the Construction and Operational Phases. The assessment involved consultation with a number of relevant organisations, a desktop review to identify features of ecological value, and follow-up field surveys of terrestrial habitats, bats, ground mammals, farmland birds and newts.

The environment around the Proposed Project includes a number of sites protected at local, national and international level, as well as a number of other sites of ecological value. In addition, eight of the ten 10 known Irish species of bat, a potential badger sett, evidence of other mammals, a number of common bird species, and smooth newt were present in the study area. The main habitats include arable fields, horticultural land, intensive agricultural land, immature grassland, mixed broadleaf woodland, hedgerows, willow-bramble scrub, treelines and managed fixed dunes.

Activities that have the potential to impact on terrestrial ecology during the Construction Phase include:

- The removal of trees, hedgerows and vegetation, and artificial lighting affecting bats; and
- Contamination from tunnelling construction techniques entering watercourses, and
- The introduction and spread of invasive species such as Japanese knotweed, Himalayan balsam or giant hogweed.

The measures proposed to avoid or reduce the impacts, include:

- Avoiding the removal of trees and hedgerows where possible and where not possible, felling under licence outside of bat hibernation periods; and protecting the roots of remaining trees;
- Vegetation and topsoil stripping to be undertaken outside of breeding bird season where possible;
- Installation of bat boxes and monitoring of use;
- Minimisation of lighting and use of directional lighting;
- Narrowing of the proposed construction corridor to avoid badger setts and fencing of construction area to allow for passage of badgers;
- Capture and relocation of smooth newts, and draining of ponds to ensure they remain unavailable to smooth newts throughout the Construction Phase;
- No construction works to take place in close proximity to watercourses;
- Cleaning of construction plant to prevent spread of invasive species; and
- Appointment of an Ecological Clerk of Work to oversee the implementation of mitigation measures.

Mayne River at Grange

A CEMP will be put in place to capture the above measures and ensure that activities are appropriately coordinated.

The proposed orbital sewer route will be located adjacent to the Tolka River, and will cross both the Santry River and Mayne River before entering the proposed WwTP at Clonshagh. The proposed outfall pipeline route (land based section) will cross the Cuckoo Stream. Impacts on the aquatic environment will be mitigated by using tunnelling techniques to cross these watercourses.

With the successful implementation of mitigation, there will be no significant remaining impacts on freshwater flora and fauna interests or downstream protected areas.

During the Operational Phase, leakages, accidental spillages of wastewater or substances such as fuels or chemicals, or contaminated surface water runoff could potentially impact on watercourses. Using Sustainable Urban Drainage Systems (SUDS) at the proposed WwTP and Abbotstown pumping station

sites will prevent pollution of surface waters. Interceptors will be installed at drainage outfalls and will be regularly inspected and maintained.

The proposed WwTP and Sludge Hub Centre may need to be lit at night, which could disturb bats. Where this lighting is required, directional lighting will be used.

In terms of reducing or eliminating Operational Phase impacts, the proposed landscaping, which has been designed to link to surrounding habitats by using native species, will mature over time and create valuable habitats, which will be a long- term beneficial impact.

With the proposed mitigation measures in place, there will be no significant remaining impacts on terrestrial flora and fauna as a result of the Proposed Project.

Proposed Regional Biosolids Storage Facility

The proposed RBSF site is not covered by any nature conservation designations. However, it is within the catchment of the River Ward which enters the Broadmeadow River north of Swords and ultimately discharges into the Broadmeadow Estuary SAC.

Rainfall runoff from the site will be attenuated onsite to be released at greenfield run off rate. It will not contain any effluent from the biosolids. Drainage near the storage buildings will be collected and discharged to the public wastewater sewer. Petrol and oil interceptors will be used to remove any potential contaminants from road runoff on the site. No changes in the water quality of the neighbouring stream or downstream watercourses are expected as a result. The northern site area will be planted with deciduous trees to mitigate the loss of some potential foraging areas for bats. Any site road lighting will direct downwards so the beam spread does not cover the proposed tree planting.

The proposed RBSF will have no significant adverse impacts on biodiversity

Landscape and Visual

The assessment considered the potential impacts of the Proposed Project on the surrounding landscape and views during the Construction Phase and Operational Phase of the Proposed Project.

This involved a desktop review of available information including aerial photography and Ordnance Survey mapping of the area. Field surveys were also undertaken which included site walkovers and the capturing of high resolution photography. This photography formed the basis of a series of photomontages which were also developed as part of the assessment. A photomontage represents the view of a model of the Proposed Project, laid onto a photograph of the view as it is currently (see example below).

For the most part, the landscape character of the area surrounding the Proposed Project is identified as low sensitivity “Low Lying Agricultural” land. However, there are some sections of high and medium sensitivity landscape at the western section of the proposed orbital sewer and Abbotstown pumping station, and where the proposed outfall pipeline is located close to the Malahide Road (north of Clare Hall) and again where it then finally reaches the coastline at Baldoyle Estuary.

The area surrounding the proposed WwTP has some rural character, but residential and industrial development and transport infrastructure are present close by. The western end of the proposed orbital sewer route and proposed Abbotstown pumping station, has a mature parkland setting with the majority of the route then passing through a range of rural, residential, industrial, recreational and transport infrastructure land uses. In contrast, the coastal end of the proposed outfall pipeline route has a more natural character with a lower intensity of development and a number of estuary and sea views. There are scenic route designations along the roads that run along both sides of Baldoyle Estuary.

The main impacts associated with the Construction Phase of the Proposed Project were assessed as being:

- Disturbance to landform and land cover;
- Removal of existing vegetation; and

- Visual impacts from, for example, presence of construction traffic, plant and equipment, temporary construction compounds, material stockpiles etc.

Overall, the nature of the impacts associated with construction activities are considered to be short-term or temporary in duration (in particular for the proposed pipeline route). Therefore, Construction Phase impacts are not considered to be significant and no specific mitigation will be required.

However, for the proposed WwTP, screening embankments are proposed on the northern, eastern and western boundaries once it's operational. The development of these embankments will be commenced begin at the beginning of the Construction Phase, which will benefit local visual receptors by screening many of the ground level construction works.

Proposed WWTP Layout

During the Operational Phase, landscape and visual impacts will be associated with new infrastructure being present in the environment, in particular the proposed WwTP and Abbotstown pumping station.

The landscape and visual impacts were important issues in the development of the current indicative design for the Proposed Project. These issues have informed the height, arrangement and colour schemes of buildings and structures for the proposed WwTP and Abbotstown pumping station and also the placement of the embankments around the proposed WwTP These details have been built into the indicative design for the Proposed Project.

The embankments around the proposed WwTP will be planted with a range of native hedgerow tree species, specimen trees and zones of wildflower planting to aid the visual screening. Tall buildings at the site will be arranged along the southern boundary to tie in with the future business park development planned for the wider area. The layout of buildings and structures within the proposed WwTP site will allow for internal green spaces, with hedgerows and the colour scheme for the buildings, helping to blend the development into the environment.

The proposed Abbotstown pumping station will consist of a traditional style structure that links in with the nearby St. Francis' Hospice building. Screen planting will be provided around the perimeter of the proposed Abbotstown pumping station site, which will help to soften the presence of security fencing.

After construction of the orbital sewer and outfall pipeline, ground cover, hedgerows and field boundaries will be re-established so that there will be no further visual or landscape character impacts.

The future contractor will incorporate these details into the detailed design for the Proposed Project through a Landscape Masterplan Statement which will be approved by Irish Water.

Following the implementation of the above mitigation measures and the establishment of screen planting, the Proposed Project is not considered to give rise to significant residual landscape and visual effects.

Proposed Regional Biosolids Storage Facility

The proposed RBSF is well-sited on the proposed site and will not give rise to significant landscape or visual effects. The proposed RBSF includes for an appropriate landscape scheme comprising earth mounding, strong deciduous and evergreen planting and an upgraded roadside boundary railing and entrance detail. The proposed RBSF will not give rise to any negative landscape or visual effects of a residual nature and so no further mitigation measures are required

Construction works will not have any impact on landscape character, landscape setting, or on views away from the immediate site boundaries or from nearby elevated sections of the N2. Likewise, there will be no impact on landscape character or on the visual nature of the predominantly industrialised area. No negative residual landscape impacts are predicted for the proposed RBSF.

Traffic and Transportation

The traffic and transportation assessment considered the potential impacts during the Construction Phase and Operational Phase of the Proposed Project on the capacity of the existing road network.

The assessment involved traffic surveys which were used to determine current traffic flows. Based on current traffic flows, the volume of traffic that is expected to be generated by the Proposed Project was calculated. The impact of this expected volume of traffic on the capacity of the road network was then determined.

During the Construction Phase, additional traffic will be generated as a result of the delivery of materials to and from the constructions sites, and construction staff commuting to and from construction sites. Modelling of the existing road network indicated that some sections are already operating above capacity, and the construction traffic from the Proposed Project will add to this.

Potential traffic impacts during the Construction Phase will be mitigated as follows:

- Creation and implementation of a Construction Traffic Management Plan;
- Information provided to local communities and relevant stakeholders;
- Access to and from the proposed WwTP construction site will be by left-turn only to avoid crossing traffic flows;
- Access to construction areas will be laid out to avoid queuing of HGVs on the public roads;
- Clear signposting and provision of clear sightlines at junctions;
- Timing deliveries outside of peak traffic hours;
- Provision of a wheelwash for construction vehicles; and
- The covering of HGV loads leaving site where required to reduce dust impacts, monitoring of roads and the deployment of a road sweeper where required.

Traffic generated during operation of the Proposed Project will be primarily associated with transportation of sludge, chemicals, office consumables and staff commuting to and from the proposed WwTP and the proposed RBSF. Computer modelling identified two sections of road near the proposed WwTP where a number of junctions or sections are already operating above capacity. This will continue during the Operational Phase, although the traffic generated by the Proposed Project will be small in proportion to existing traffic flows.

Increased congestion will be influenced more by the general predicted increase in background traffic rather than as a result of the Proposed Project. However, a number of mitigation measures will be employed to reduce the traffic congestion and impact. These will include:

- Completion of a further Road Safety Audit at the detailed design stage;
- Access to and egress from the proposed WwTP will be by left-turn only;
- Access to the proposed WwTP will be designed to avoid queuing of HGVs on the public road network;
- Provision of clear sightlines at the entrance and exit, and stop markings at the exit from the proposed WwTP;
- Provision of sufficient car parking spaces for staff and visitors;
- Pedestrian and cycling routes will tie into existing facilities on the public road network, where possible; and
- Consideration of measures to encourage use of sustainable modes of transport will be carried out, where possible (e.g. tax saver commuter tickets, / car sharing options/ and scheduling of shifts to start and end outside of peak traffic times).

With these measures in place, minimal impacts on the road network in the vicinity of the Proposed Project will remain.

Proposed Regional Biosolids Storage Facility

No negative residual impacts are predicted for the RBSF element of the Proposed Project.

Air Quality, and Odour and Climate

This assessment considered the potential emissions to air and odours that may arise as a result of the Proposed Project, and the likelihood of these emissions and odours having an impact on nearby sensitive receptors. The assessment included a review of available information, determination of existing air quality, and modelling of predicted emissions.

According to Environmental Protection Agency air quality data, and the results of a number of site specific surveys at 12 locations in the vicinity of the Proposed Project, the existing air quality environment in the area is generally within the national and European Union ambient air quality standards.

The main potential emissions associated with construction of the Proposed Project will be:

- Particulate matter (dust) and spores of the aspergillus fungus (a common mould which are is not normally a problem other than for people with weak immune systems) from excavation and earthmoving; and
- Emissions from construction vehicles including particulate matter, nitrogen oxides (NO_2, and NO_x), carbon monoxide (CO) and benzene.

At high levels, these substances can cause nuisance or health impacts. However, measures will be employed to avoid or reduce the emissions, including the implementation of a specific Dust Management Plan, and adherence to national guidance aimed at preventing the release of fungal spores, including near sensitive receptors such as Connolly Hospital and St. Francis' Hospice.

During operation of the Proposed Project, the primary sources of emissions will be the proposed Abbotstown pumping station generators, the proposed WwTP Combined Heat and Power system and various other elements of the proposed WwTP. The operations have the potential to generate odours, and air pollutants. However, the operations will be managed, and emission and dispersion modelling indicated that there will be no negative impacts from odours or other substances generated during operation of the Proposed Project.

With the implementation of the proposed mitigation measures, it is expected that there will be no significant remaining air quality or odour impacts.

Proposed Regional Biosolids Storage Facility

Impacts to air quality and climate have been assessed to be imperceptible. Residual impacts are not predicted.

The project design includes several odour control and minimisation measures, including: all materials handling to happen within buildings which ventilate through odour control units; and, operations to occur according to an Odour Management Plan.

Thereafter the impact assessment has concluded that the proposed RBSF will result in an imperceptible neutral impact on the local environment and consequently no other mitigation is proposed

There were no significant residual odour impacts identified by the assessment from the construction and normal operation of the proposed RBSF.

Noise and Vibration

This assessment considered the potential impacts of noise and vibration generated during the Construction and Operational Phases of the Proposed Project.

The assessment involved a review of available existing information, completion of baseline noise and vibration monitoring to establish the current background levels, and modelling of noise and vibration levels predicted to be generated during the Construction and Operational Phases.

The baseline surveys determined that, currently, the main sources of noise within the study area include road traffic on nearby roads and aircraft overhead on approach to or departing Dublin Airport. In terms of vibration, there were no significant vibration sources in the nearby, with the main source also relating to traffic on nearby roads.

Following the collection of the baseline data, noise and vibration impacts associated with the Construction and Operational Phases were predicted through calculations and noise modelling. Sensitive receptors included a number of residential properties, Connolly

Hospital and St. Francis' Hospice, amongst others, and which were used in the assessment. Construction Phase activities will generate noise, from a range of activities, including construction traffic, rock-breaking activities, piling, and construction of compounds for the micro-tunnelling (trenchless) works.

In addition, micro-tunnelling works may also generate groundborne noise (which would be perceived differently to typically experienced noise, because. This is due to the fact that it is heard as a result of vibrations being experienced through the ground and walls of buildings which results in a "'rumbling"' noise in the rooms of buildings).

Noise in the marine environment resulting from the construction and operation of the marine outfall was also considered in terms of potential impacts to wildlife such as marine birds and mammals.

Potential noise and vibration impacts during the Construction Phase will be mitigated through the following:

- Following best practice guidance, including development and implementation of a Noise and Vibration Management Plan which will set out how construction works will be undertaken by the contractor in line with noise standards identified for the Construction Phase;
- Appointment of a dedicated point of contact in dealings with local stakeholders, including notification before commencement of key works expected to generate noise or vibration (such as the micro-tunnelling works);
- Use of mobile acoustic screens and site hoarding for noisy activities at required locations;
- Noise and vibration monitoring at noise sensitive receptors and on- site monitoring of the physical works to ensure that noise and vibration standard limits are not exceeded;
- Prior notification of micro-tunnelling works near the Educate Together School and St. Nicholas Myra National School on the R107 Malahide Road Schools and completion of the works during the summer months where possible;
- In relation to the potential for groundborne noise, the contractor shall develop detailed method statements prior to commencement of beginning works and undertake regularly liaison liaise with relevant noise sensitive receptors in relation to the proposed construction works;
- Completion of regular noise audits by Irish Water to confirm that noise mitigation measures are being correctly implemented by the contractor; and
- In relation to underwater noise, a qualified and experienced marine mammal observer will monitor for marine mammals during marine works. Dredging activity will not commence if the observer sees marine mammals within 500m of the dredging noise source. The duration of dredging operations will be minimised and will only take place during daylight hours so any marine mammals can be seen. to allow for visual. Before dredging starts, visual monitoring will be carried out and dredging can will only start following 30 minutes with no marine mammal sightings.

With these measures in place, the noise and vibration construction impacts will not be significant and will be short -term in duration. During the Operational Phase of the Proposed Project, noise levels will be below relevant noise standards set for the Operational Phase and are not expected to impact noise sensitive receptors in the vicinity. No specific mitigation measures are therefore proposed.

Proposed Regional Biosolids Storage Facility

The existing noise climate in the vicinity of the proposed RBSF was established by way of a baseline noise survey comprising both continuous unattended and short term attended monitoring.

During the Construction Phase, it is expected that increased noise levels will be generated over a temporary period

The primary sources of noise in the operational context are deemed to be long term in duration and arise from building services plant, material handling as well as vehicular movement onsite and on public roads.

The overall level of noise generated by the site will fall within best practice guideline values and as such is deemed to be insignificant.

Once mitigation measures are implemented as proposed and no residual noise or vibration impacts are expected to arise as a result of the operation of the proposed RBSF.

Archaeology and Cultural Heritage

This assessment considered potential impacts of the Proposed Project on archaeological, architectural and cultural heritage resources during the Construction and Operational Phases of the Proposed Project. This was achieved by a review of publicly available information, consultation with relevant bodies, field inspections, geophysical surveys, and excavation of archaeological test trenches.

Any potential impact on archaeology will only be occur during the Construction Phase. Excavation and disturbance of ground will impact on a number of sites. These sites include:

- 10 recorded archaeological heritage sites, including one site that is also recorded as a built heritage site;
- 17 areas of archaeological potential, one designated landscape site, one unrecorded built heritage site; and
- A number of townland boundaries.

In addition, a programme of archaeological trenching and excavations will be undertaken within the footprint of the Proposed Project (including sites which cannot be avoided) to identify and record previously unknown archaeological remains.

Full photographic landscape records will be made of the designed landscape site in the vicinity of the proposed WwTP, and written and photographic records will be made of the townland boundaries prior to construction activities commencing.

Where watercourses are designated as areas of archaeological potential, underwater or wade surveys will be undertaken prior to construction activities.

Once all the mitigation measures have been implemented, it is expected that there will be no residual impacts on archaeological, architectural and cultural heritage resources as a result of the Proposed Project.

Proposed Regional Biosolids Storage Facility

There will be no direct impact on any items of cultural heritage, archaeology or buildings of heritage interest in the application area or the vicinity of the proposed RBSF during the Construction Phase of the Proposed Project.

The Operational Phase will have no direct or indirect impacts on any known items of cultural heritage, archaeology or buildings of heritage interest in the application area or the vicinity of the proposed RBSF.

No negative residual impacts are predicted for the RBSF element of the Proposed Project.

Soils and Geology

The assessment considered the potential impacts during the Construction and Operational Phases of the Proposed Project on soils and geology and comprised a review of publicly available information and site specific data obtained through preliminary ground testing.

The geology (soils and rock) beneath the study area generally comprised top soil or made ground (artificial or reworked soils) on top of clay which overlays limestone rock. Beneath the proposed WwTP site, there is clay on top of gravels. The proposed orbital sewer and outfall pipeline (land based section) are on top of grey-brown soils, tills and limestone, whilst beneath the proposed outfall pipeline route (marine section) soils were found to be made up of marine deposits in the form of sands and gravels overlaying clays, which in turn overlay limestone.

The proposed orbital sewer will cross two historical unregulated landfills. It is likely that contaminated ground will be encountered in these locations. This may require specific measures to be put in place during construction, such as procedures for working with potentially contaminated soils and appropriate waste management. However, taking into account the measures proposed to reduce impacts, no significant

residual impacts as a result of contaminated land are anticipated.

The following elements have the potential to impact on soils and geology during construction:

- Removal of top soils from the sites of the proposed WwTP and Abbotstown pumping station;
- Excavations of soils and rock;
- Movement of contaminants during excavations in historical landfills;
- Movement of marine sediments and disturbance of the seabed during dredging for the proposed outfall pipeline route (marine section); and
- Generation of spoil and water (drill cuttings) and used drilling lubricants (muds) from tunnelling construction techniques.

The measures put in place to avoid or reduce the above potential impacts include:

- Adherence to best practice construction techniques, and putting good environmental management and pollution control procedures in place;
- Use of techniques to reinforce excavations to reduce excavation volumes;
- Reuse of excavated soils;
- Replacement of dredged marine sediments;
- Use of dredging techniques that will minimise disturbance of the seabed and mobilisation of sediments where possible; and
- Identification, segregation and off-site disposal of contaminated materials.

There will be a slight risk that the soil quality within and around the proposed orbital sewer and outfall pipeline routes could be impacted by contaminated wastewater. However, all elements of the pipelines will be designed to be watertight and constructed following best practice to minimise this risk. This will result in no predicted impacts on soils and geology during the operation of the Proposed Project.

Proposed Regional Biosolids Storage Facility

The only interactions with soils and geology environment will be as a result of routine excavation for foundations, site contouring and landscaping. Following the implementation of a CEMP and a Waste Management Plan (WMP), no negative residual impacts are predicted.

Agronomy

The assessment considered the potential agricultural impact of the Proposed Project. It was undertaken through a desktop survey, and farm visits and questionnaire surveys with landowners.

The following elements have the potential to impact on agriculture:

- Permanent loss of agricultural land at the proposed WwTP and Abbotstown pumping station locations and temporary loss within the proposed construction corridor of the proposed pipeline routes during construction;
- Temporary disruption to farming activities, such as temporary change to access arrangements, services and drainage;
- Construction-related traffic, noise and dust generation;
- Removal of trees and hedgerows that provide shelter to crops and livestock;
- Spread of harmful weeds or diseases;
- Temporary reduction in production due to loss of top soil, soil mixing or soil compaction during construction; and
- Restrictions on future land use changes and construction activities within the area of the permanent wayleave along the proposed orbital sewer and outfall pipeline routes.

The above potential impacts will be reduced through meetings and discussions with landowners and implementation of best practice construction techniques, including those used to avoid and reduce generation of dust and noise during construction. Disease protocols and farm biosecurity measures will be adhered to in order to prevent the spread of pests and diseases.

Landowners will be compensated for permanent land-take and temporary loss of production. Following construction, agricultural lands within the construction corridor will be reinstated. This will be undertaken during appropriate weather conditions to reduce impacts.

Following implementation of the above measures, residual impacts of regional or national significance on agronomy are not predicted as a result of the Proposed Project. However, there is will be a local impact due to the permanent loss of agricultural land at the proposed WwTP.

Waste

The assessment considered the anticipated types of waste that will arise as a result of the construction and operation of the Proposed Project, and the potential impacts of its generation and management.

During the Construction and Operational Phases of the Proposed Project, waste will be managed in line with the "waste hierarchy", which is outlined in national waste legislation. This hierarchy will focus on avoidance and reduction of waste generation where possible, followed by reuse, recycling and recovery, with waste disposal always being the last option.

Waste Hierarchy

Waste generated during the Construction Phase is expected to comprise primarily:

- Excavated materials (rock, clays and soils);
- Drilling fluid (bentonite in water) from the micro-tunnelling activities; and
- Surplus construction materials such as packaging, oils, paints and concrete.

The contractor will prepare a WMP for the Construction Phase. The WMP will outline how the contractor will manage construction waste for the Proposed Project. The WMP will also provide information on where construction activities are taking place to avoid or reduce waste generation, such as

using suitable excavated materials to backfill the trenches which have been dug for the proposed orbital sewer route and outfall pipeline route.

Authorised sites where surplus material can be reused will be identified and used, with any remaining excess material removed from site by a licensed waste collection permit holder and transferred to a relevant authorised facility for disposal or recovery.

Waste generated during the Operational Phase is expected to comprise:

- Sludge from the wastewater treatment process;
- Inlet works screenings;
- Grit; and
- Maintenance waste and waste from office activities.

Sludges will be treated by a fully enclosed process at the proposed WwTP, which will produce 'biosolids' and 'biogas'. This will therefore reduce the volume of material leaving the proposed WwTP. The '"biosolids"' will be suitable for reuse on land in line with best practice. The '"biogas"' will be recovered for use as an energy source within the proposed WwTP.

All other wastes generated during the Operational Phase will be disposed of at appropriately licensed facilities.

Following the implementation of these measures during the Construction and Operational Phases, the Proposed Project is not considered to result in significant negative residual impacts with regard to waste management.

Material Assets

This assessment considered the physical and technical impacts of the Proposed Project during the Construction and Operational Phases on material assets. Material assets were considered in terms of:

- Major utilities such as roads, gas and electricity transmission lines and rail lines;
- Natural features such as rivers and streams; and
- Raw materials usage including piping, concrete and steelwork.

A desk study of available information and consultation with relevant organisations was undertaken to identify the existing major utilities in the area, and an estimate was made of the materials required to construct the Proposed Project.

The majority of impacts associated with material assets will be experienced during the Construction Phase. and where possible, the Proposed Project has been designed to avoid interactions with other major utilities and natural features.

However, the Proposed Project will involve the crossing of some utilities including gas, electricity and water mains, wastewater sewers, communication infrastructure, rail infrastructure, motorways and national primary roads. The Proposed Project will also cross six rivers and streams.

Utilities will be protected and significant infrastructure, such as major roads, and waterways and the railway line, will be crossed using tunnelling techniques to minimise impacts. Construction will require the use of various natural resources such as stone aggregate for pipe bedding, concrete, steel, insulation materials, glass, roof slates and other materials. As materials will be reused where possible, it is anticipated that the sourcing of raw materials will not have a noticeable impact on the availability of existing natural and other resources.

No additional impacts are expected during the Operational Phase which have not already been considered as part of the Construction Phase. The resulting residual impact upon raw materials in the vicinity near the Proposed Project will be Slight, Negative and Permanent.

Cumulative Impacts and Interactions

The assessment of environmental impacts associated with the Proposed Project considered interactions between environmental aspects, for example interactions between traffic and air quality, and cumulative impacts with other developments.

The cumulative impact assessment considered the way in which an environmental resource, such as surface water, could be impacted by more than one

development. The impacts from multiple developments may potentially overlap or act in combination, leading to potentially more significant environmental impacts than if the impacts were considered in isolation.

The assessment considered potential cumulative impacts from the following proposed developments:

- Aviation Fuel Pipeline from Dublin Airport to Dublin Port;
- Dublin Airport Northern Runway Project;
- Connolly Hospital Development;
- Belcamp Housing Development;
- Remediation of land at Clonshagh (Clonshaugh), Belcamp;
- The Coast Development, Baldoyle;
- Blanchardstown Regional Drainage Scheme (BRDS);
- Drumnigh Housing Development;
- Red Arches Housing Development;
- Sutton-Malahide Greenway;
- Ringsend WwTP Upgrade Project; and
- Station Manor Portmarnock Housing Development.

The assessment concluded that the mitigation measures already included for the Proposed Project will be appropriate and sufficient to mitigate against cumulative impacts. The implementation of these measures will avoid or reduce the majority of the identified potential cumulative impacts to an acceptable level with the exception of:

- Traffic during the Construction Phase and Operational Phase, which may continue to represent a significant negative impact (although it should be noted that this is accounted for in the traffic growth factors built into models); and

- The sterilisation of the proposed wayleave from future development, which will have to be accounted for during the master planning phases of such development.

Proposed Regional Biosolids Storage Facility

The proposed RBSF is unlikely to give rise to any significant effects cumulatively or, in combination with existing and or permitted projects in the area. Furthermore, the proposed RBSF has been designed to accommodate the combined biosolids volumes from both the Proposed Project and the Ringsend WwTP (and upgrade works subject to permission) in a manner that will not give rise to significant environmental effects on the surrounding environment.

Figure 1: The Proposed Project