UISCE EIREANN : IRISH WATER

Comhairle Contae Fhine Gall
Fingal County Council

Leixlip WTP

Planning Report

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1 INTRODUCTION

1.1 Preamble & Executive Summary

The following sets out key issues and considerations arising in terms of the proposed development, as elaborated on throughout the report, as supported by additional assessments enclosed with the planning application:

1. The Leixlip Water Treatment Plant (WTP) is the second largest treatment plant in Ireland, has been in operation at this site since 1967 and is a primary source of water supply for the Greater Dublin Area;
2. The WTP has been expanded and reconfigured, modernised, etc. to respond to changes to standards and processes on numerous occasions since its foundation;
3. This proposal relates to a further modification to the treatment process, inserting a new 'step' in the process (enhanced coagulation and pH control of water in the treatment process);
4. This step arises following significant under-investment in the facility over many years and the identification of a number of deficits on site.
5. The proposed development is required to ensure treated drinking water supplied to approximately 600,000 customers meets the requirements of the Treated Drinking Water Regulations and addresses a direction from the EPA.
6. Failure to implement the proposed development could have detrimental effects on water quality and/or the security of supply of potable water in the Greater Dublin Area;
7. This step is directly related to the National Planning Framework's National Strategic Outcome 9 - Sustainable Management of Water and other Environmental Resources which inter alia notes that "Investment in water services infrastructure is critical to the implementation of the National Development Plan."
8. The step is also directly related to the South Dublin Development Plan 2016-2022 and associated water policies and objectives including: *"IE1 Objective 1: To work in conjunction with Irish Water to protect, manage and optimise water supply and foul drainage networks in the County"* and *"IE1 Objective 2: To work in conjunction with Irish Water to facilitate the timely delivery of ongoing upgrades and the expansion of water supply and wastewater services to meet the future needs of the County and the Region."*
9. A review of alternative processes has been carried out with the preferred solution being subject to this planning application;
10. The proposed development is the optimal solution by a regulated water utility to address the public health risk as outlined in the EPA Direction.
11. The process dictates the scale and bulk of the proposed buildings, with no scope to modify their size;
12. The nature of the layout of the treatment plants and overall complex and characteristics of the site and surrounds dictates the location of the proposed buildings, with no scope to modify their location;
13. Much of the proposed development is considered to be of particularly limited effect in terms of impact or effect on the wider area, given the long established and substantial scale of activity on site built up over a number of decades, with the proposed development being proportionately minor in comparison;

14. It is acknowledged however, that the proposed Lime Dosing Facility is situated in a localised sensitive area, visible from the public domain, in the vicinity of protected structures, important views and an area of landscape amenity;

15. For context, we also highlight that planning permission was previously granted for a substantial (two storey) structure in this area under *Reg. Ref: S00A/0230*, demonstrating that the principle of substantial development in this specific location has been deemed appropriate by the Planning Authority in the past;

16. Irish Water and the design team have sought to mitigate the effects of the Lime Dosing Facility through consideration of a number of design modifications (within the parameters available whilst maintaining the functionality of the facility);

17. The proposed architecturally designed screens to the lime dosing facility mitigate the appearance of these structures, thereby minimising the impact on this localised area;

18. The enclosed Archaeological & Built Heritage Assessment also considers the architectural heritage aspects of adjoining protected structures (notably the Salmon Leap Inn) and concludes that the development as proposed would have a moderate visual impact;

19. The enclosed Architectural Design Statement and Landscape and Visual Impact Assessment demonstrate the consideration of various options and alternatives, and the effect of the proposed development on the area;

20. Ultimately, the Landscape and Visual Impact Assessment (LVIA) notes a degree of adverse impact, however the extent of such impact is considered to be limited, affecting a narrow area, with neutral effects prevailing across the wider range of views in the area;

21. These impacts must also be considered in the context of the 'Forces of Landscape Change', as noted in the LVIA, stating that: *"many of the drivers for change arise from the requirement for development to meet the needs of a growing population and economy. The concept of sustainable development recognises that change must and will occur to meet the needs of the present, but that it should not compromise the ability of future generations to meet their needs. This involves finding an appropriate balance between economic, social and environmental forces and values."*;

22. The drivers of change in this instance are explicit and strategic national and local planning and environmental policy as set out above;

23. It is our opinion, that the limited adverse effects are acceptable to ensure public health issues are addressed so that water supplied from this regionally important WTP to 600,000 customers, is compliant with the Drinking Water Regulations and the direction of the EPA;

24. We also reiterate that the impacts predicted are considered to be a last resort, in that alternative locations, processes and designs have been thoroughly considered, with the scheme as proposed being the optimal approach, for a variety of reasons as set out in detail herein; and,

25. For instance, the proposed development, in the context of typical planning criteria, can in our opinion be classed as the 'do minimum' scenario, compared to a 'do nothing' scenario (which would have significant repercussions on water supply for the GDA) or the 'do something' scenario (i.e., an alternative approach as has been discounted herein).

1.2 The Applicant

As of 14 January 2014, Irish Water assumed responsibility from local authorities for water services functions nationally. Irish Water is a regulated water services utility. The Environmental Protection Agency (EPA) is the technical and environmental regulator and, amongst other things, enforces Drinking Water Regulations.

The Commission for Regulation of Utilities (CRU) is the financial regulator and aims to ensure water services are delivered in a safe, secure and sustainable manner and that Irish Water operates in an efficient manner. One of the key ways in which the CRU does this is through the revenue control process.

This application is being sought to deliver improvements to the operation of the existing Water Treatment Plant (WTP) at Leixlip, which is a nationally significant facility.

The operation of the plant is carried out by Fingal County Council on behalf of Irish Water under the Service Level Agreement (SLA).

The site is under the ownership of Fingal County Council, and is in the process of being transferred to Irish Water. A letter of consent to make the application is enclosed herein.

1.3 Overview of the existing Leixlip WTP

Leixlip Water Treatment Plant complex is the second biggest water treatment plant in Ireland. Raw water is extracted and is treated prior to distribution to 615,000 customers in the Greater Dublin Area.

The use of the site dates back to 1967 since the initial water treatment facility was developed, which has expanded and evolved significantly in the proceeding years.

Current treatment processes at the complex consists of screening, coagulation, flocculation, clarification, rapid gravity filtration, chlorination and fluoridation. The proposed development will enhance this treatment process, as detailed in Sections 1.3-1.6 below.

The complex is located along the banks of the River Liffey within the functional area of South Dublin County Council. The overall site extends to the south to the M4 motorway and to the north to the R148 Leixlip Road.

The complex consists of two separate plants: the "New Plant" and the "Old Plant" each comprising a series of buildings and structures (annotated in Figure 1 below). The combined daily production will continue to operate within a range of 170 to 231MLD. There will be no increase to abstraction resulting from the proposed development. A Sludge Treatment Plant is also present on site (annotated in Figure 1 below).

The two plants are located c. 250 metres apart, owing to the site characteristics and constraints, as discussed below in Section 2.0 further. In short, we note that much of the greenfield land between the old and new plants is heavily constrained in terms of utilities, topography and archaeology.

As such, development within the existing footprint of the complex is the only viable approach to the proposed development, as detailed below. Figure 3 below illustrates same.

Raw water enters the site from the River Liffey, with treated water leaving the site at an existing outlet at the Leixlip Road, as illustrated on the enclosed drawings.

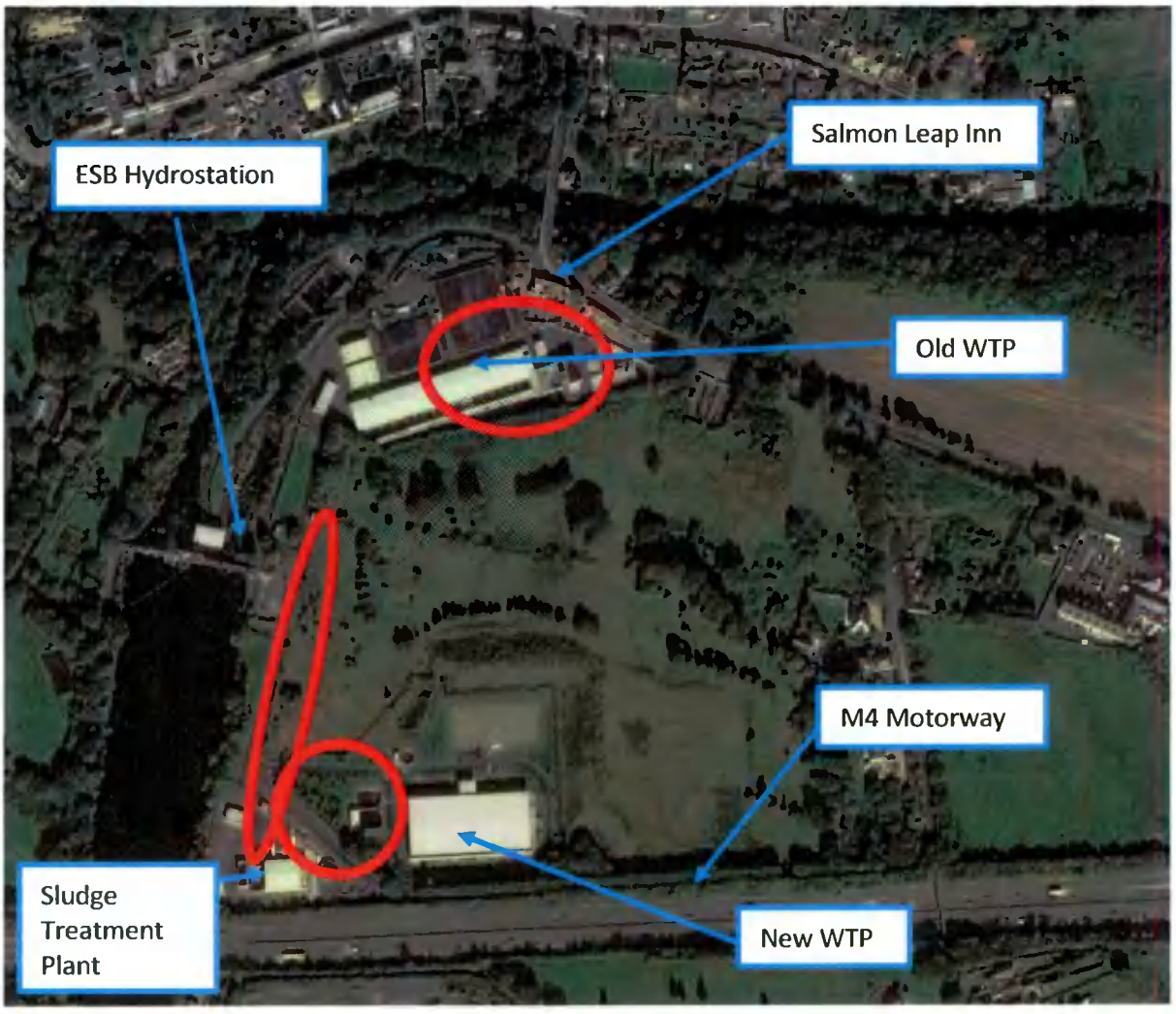

Figure 1: Aerial View of existing WTP Complex (Proposed Development areas circled in red)

1.4 Project Need

Leixlip WTP is a critical asset which supplies water to a large proportion of population of the Greater Dublin Area (GDA), and requires continual maintenance and upgrades to equipment, buildings and other infrastructure, including availing of emerging technologies and processes in the treatment cycle.

The proposed development, subject to this application, is required to ensure the ongoing supply of treated drinking water to the receiving population.

The Leixlip WTP has been subject to a number of EPA audits for treatment and management issues and remains subject to EPA Direction, specifically for pH control. The works proposed in this application are key to complying with the EPA Direction, and ensuring water security to the Greater Dublin Area for the future.

The proposed development is required to provide preventative measures to ensure that the existing WTP has adequate treatment processes in place to supply potable water which complies with European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014).

On the 22nd October 2019 the Leixlip supply was put on a Boil Water Notice following the failure of alum dosing system at the PCI section of the plant. Following extensive modelling, flushing and sampling the Boil Water Notice was lifted on 25th October.

A Boil Water Notice was however reinstated on 4th November 2019 due to reduction in the treated water quality which was as a result of increased turbidity and organic load in the raw water in the River Liffey. This Boil Water Notice was in place until 12th November 2019.

The subject planning application relates to a specific project within an overall long-term programme or works and maintenance that will be undertaken at the plant into the future, in this instance the provision of enhanced coagulation and pH control at the plant complex. The proposed works are required to address the issues that resulted in boil water notices being issued in 2019.

1.5 Overview of the Proposed Development

The proposed development will provide the necessary infrastructure to upgrade the treatment processes of Old and New Leixlip WTPs to safeguard the drinking water supply to enable Irish Water to meet the demands of its customers in the Greater Dublin Region, including Fingal, South Dublin, Dublin City and areas of Counties Meath and Kildare, while maintaining the required treated water quality at all times.

In essence, the proposed development relates to enhanced coagulation and pH control of water in the treatment process, which involves the introduction of sulphuric acid to the water treatment process (to lower the pH), and its removal (i.e. de alkalisation / pH raising) thereafter from the treated water.

The various elements of the proposed development as described below all relate to, or will otherwise facilitate, this core function.

These processes, or sub-processes, within the overall existing treatment plants, will all take place within the existing overall treatment system, i.e. the 'raw' water inlet and the treated water outlet will be unchanged, with no change to water volumes / throughputs arising directly from the proposed development.

The nature of these treatment processes informs the design and siting of the physical elements of the proposed development, insofar as operational requirements and parameters dictate the location and scale of the proposed buildings and infrastructure, as set out above. Figure 2 below illustrates the position of the proposed development in terms of the overall process on site.

Section 1.6 below elaborates on the individual elements of the proposed development and their characteristics and requirements, including in relation to siting.

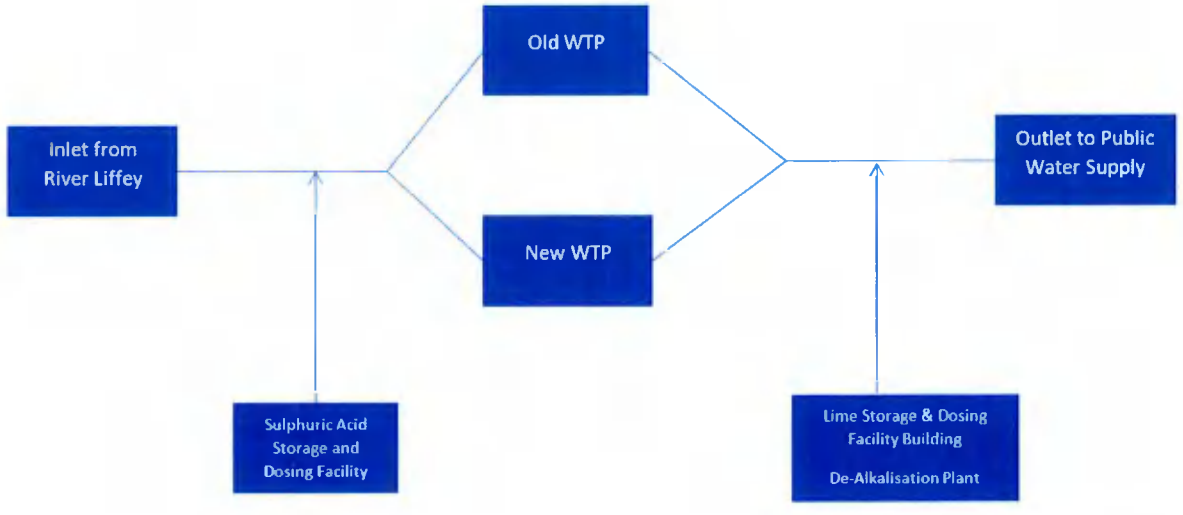

Figure 2: Outline of Proposed Development as part of Existing Treatment Plant Site

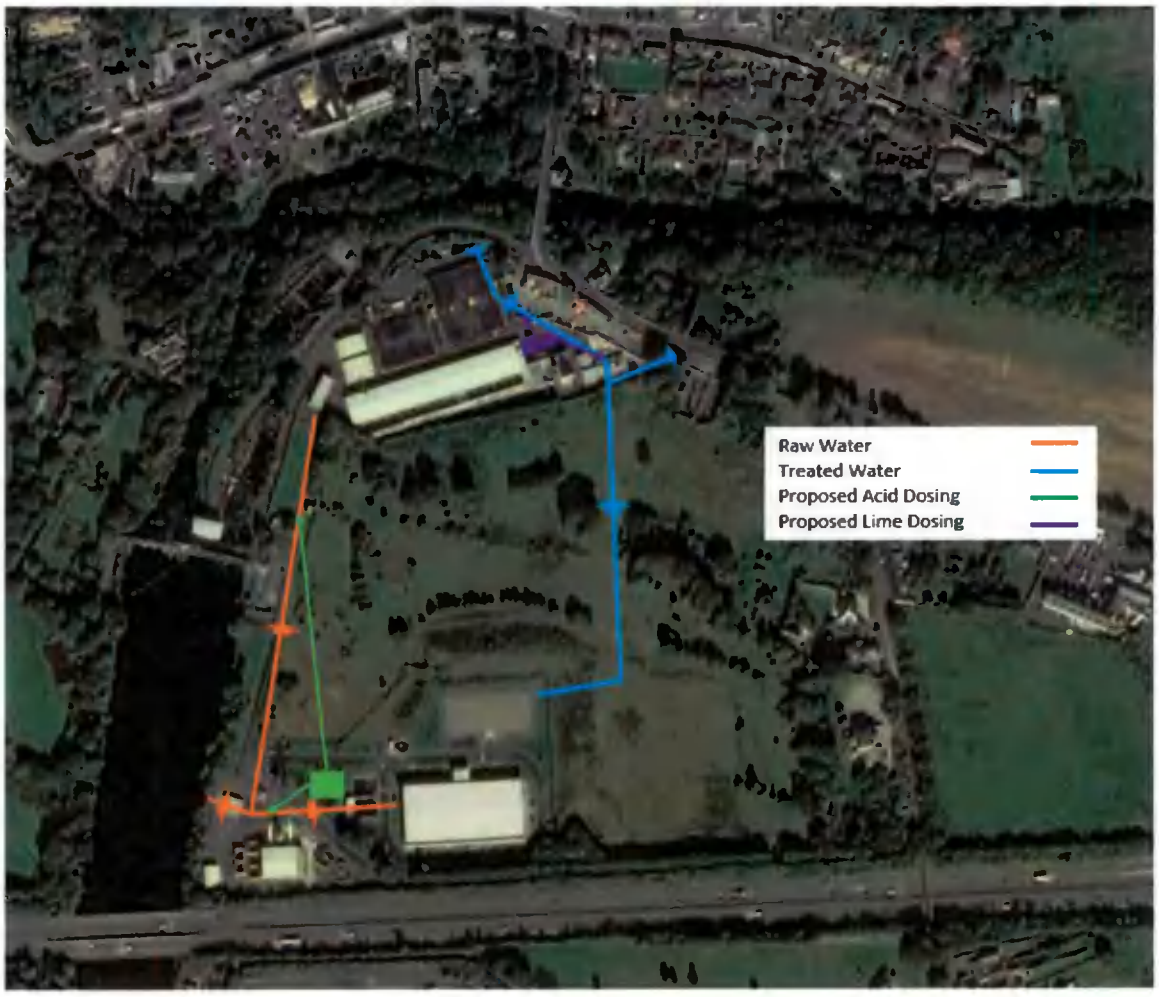

Figure 3: Overview of Key Water Network Routes on Site

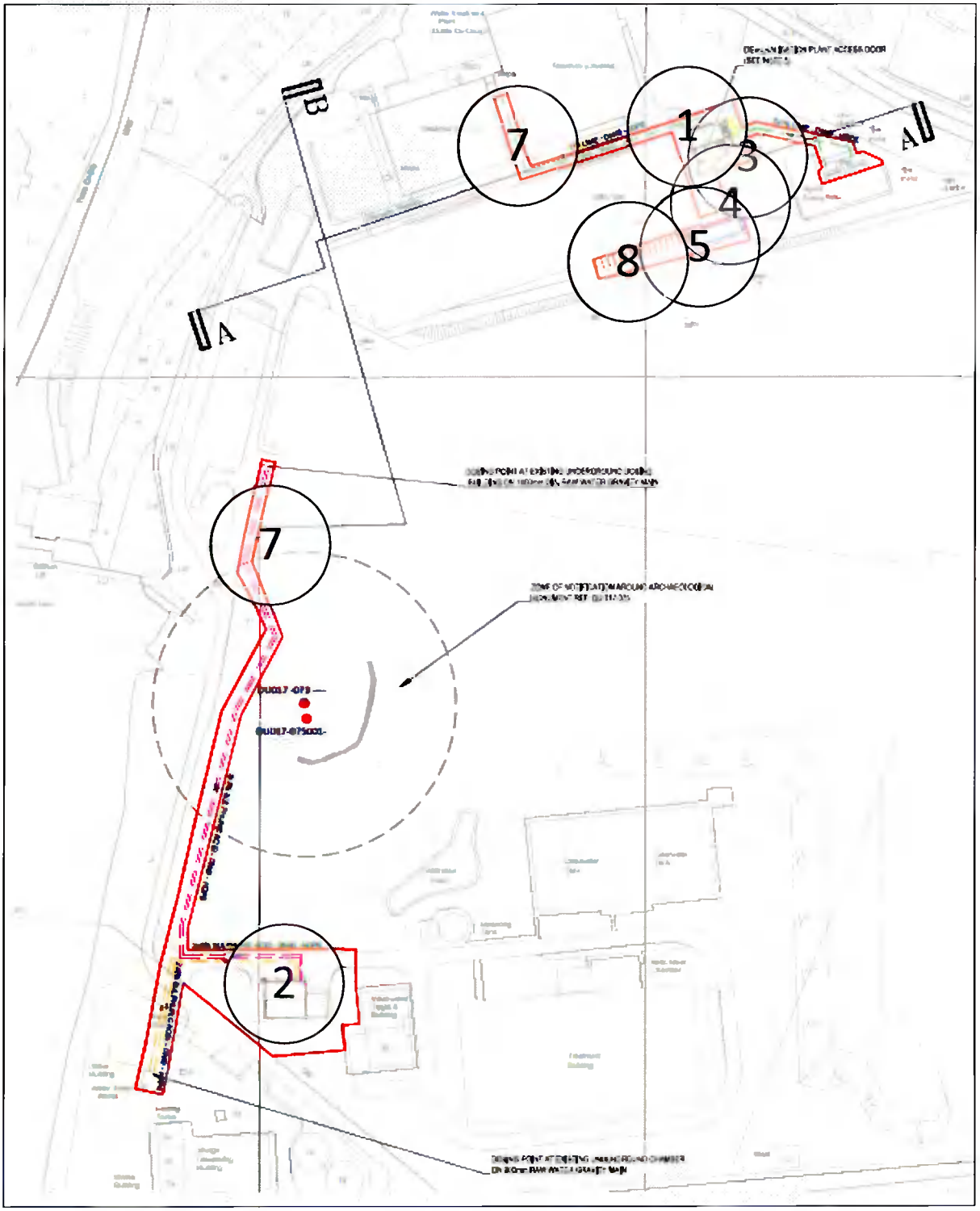

Figure 4: Site Layout Illustrating Elements of the Proposed Development (Extracted from Planning Drawing No. 11118-RHL-LP2-XX-DR-PL- 0003

1.6 Description of the Development

The proposed development specifically relates to permission for development for the following elements (annotated in Figure 4 above where applicable):

1) Demolition of existing Workshop and (defunct) Activated Carbon Building adjacent to the 'old' / northern Treatment Plant Building, measuring approximately 77 m^2 and 71 m^2 respectively. to the demolition of these structures will provide the development footprint required to accommodate the Lime Dosing (i.e. pH raising) building and storage tanks. As noted under the relevant heading below, the Lime Dosing building and storage tanks have very particular design and location parameters.

2) Construction of a Sulphuric Acid Storage and Dosing Facility Building measuring approximately 379 m^2 (single storey up to approximately 8.7 metres in height) adjacent the 'new' / southern Treatment Plant Building. This building is required to provide the introduction of sulphuric acid to the water treatment process (to lower the pH), at a point in the overall network / cycle, prior to raw water entering either the new or old Treatment Plant. A range of options have been considered, as set out in Section 1.7 below, with the subject proposal being deemed the most appropriate having regard to a number of factors. The Acid Storage & Dosing Facility is an integral component of the selected process.

3) Construction of a Lime Storage & Dosing Facility Building measuring approximately 166 sqm (single storey up to approximately 11 metres in height) adjoining the 'old' / northern Treatment Plant Building, associated external storage silos (2 no.) with external staircase (up to approximately 12.3 metres in height) partially enveloped with a perforated metal architectural screen, and ancillary plant and equipment. This building is required to provide the Lime Dosing (i.e. pH raising) building and storage tanks. Similar to the above, the Lime Storage & Dosing Facility is an integral component of the selected process, as elaborated on in Section 1.7 below. As noted in Section 1.8, the mass / scale / form of the facility is relatively fixed, however the design team has reviewed a range of architectural responses to optimise the appearance of the structure and mitigate any visual effects, etc. The enclosed Design Statement prepared by Taylor McCarney Architects elaborates on the design process, can be summarised as follows:

   - Given the fixed nature of the mass, form and location of the proposed structures, an architectural screening has been proposed to mitigate the impact on nearby sensitive receptors and landscape character;
   - Consideration was given to making a 'landmark' type structure of the facility, i.e. to explicitly stand out through bright colouring, lighting, etc., however this option has been discounted, as the overarching priority chosen has been to seek to reduce the visibility and noticeability of the facility;
   - Architectural screens are standard construction practice for avoiding and minimising landscape and visual effects. As noted in the enclosed Landscape Visual Impact Assessment (LVIA): *"Architectural screening is proposed to clad these "silo" type structures within a simple cuboid form made of a light metallic grill. This will mitigate their industrial form in the landscape avoiding a more negative image or effect."*;
   - The selection of materials will minimise visual contrasts arising from colour, scale or configuration;
   - The screening will minimise effect on local views of the site and the selection of suitable materials and finishes for the main screen will further minimise visibility (e.g. blending into the a dull grey skyline, etc.);
   - A number of materials / formats were considered including: a planted 'Climber' type screen (discounted due to hygiene requirements, amongst other constraints) and a

Wooden Fin material with random geometric pattern (discounted due to inconsistency of its appearance over time and the need for constant maintenance and eventual replacement);

- Other factors were also considered such as artificial lighting. The intention is not to light the structure and artificial outdoor lighting will be limited to safety and security requirements;
- The preferred and proposed scenario is that of Metal Perforated Screening, which has advantages such as: unique aesthetic appearance, can be manufactured in various patterns and in various perforated shapes e.g. square and round to ensure maximum effect; is cost effective; and, is low maintenance;
- The safety railings to the top of the structures are essential. The railings are so slight they will not be noticeable when viewed from the public road;
- The lime silos are much less visible and blend in with adjoining buildings when viewed from the three identified viewpoints; and,
- It is considered that the effects on the wider landscape character are likely to be neutral and that the effects on the local landscape character are likely to be minor.

The above and enclosed Design Statement thoroughly examines the potential design solutions and the improvements delivered as a result of the process, as recognised in the enclosed LVIA. The design and finishes of the facility are therefore considered to be a proportionate and acceptable solution for the subject site.

4) Reconfiguration and repurposing for use as a De-Alkalisation Plant of existing (disused) High-Lift Pump Hall within the 'old' / northern Treatment Plant Building and measuring approximately 172 m2. This repurposing of an existing (disused) space within the overall existing WTP is intended to serve an important part of the overall pH control of water in the treatment process, as elaborated on in Sections 1.7 & 1.8 below. It will not involve new construction but rather avail of an existing space within the facility, in part enabled by the adjacent positioning of the Lime Storage & Dosing Facility.

5) The construction of a new ancillary Workshop Building (single storey up to approximately 4.5 metres in height and measuring approximately 111 sqm) to the rear / south of the 'old' / northern Treatment Plant Building. This element of the proposed development relates to provision of a new workshop building, to the 'rear' of the proposed De-Alkalisation Plant, to provide the necessary footprint to facilitate the proposed Lime Storage & Dosing Facility. For the avoidance of doubt, please note that this location would not be suitable for the Lime Storage & Dosing Facility Building given the limited depth from existing buildings to the southern site boundary (a steep bank retaining elevated lands beyond), with ESB lines also traversing the top of the bank.

6) Temporary and enabling works to facilitate construction and continued / uninterrupted operation of the Treatment Plant site. Section 1.8 details a number of temporary / enabling works which are required to facilitate the proposed development.

7) Associated network of underground pipelines / connections, and redirection of existing where necessary, throughout the site. As noted above, the Sulphuric Acid Storage and Dosing Facility Building will be constructed to connect to the raw water inlet, and a 'dosing line' will be constructed to deliver water from this building to both the old and new treatment plants. In relation to the latter this will involve only a minor adjustment as illustrated on enclosed drawings, whilst in relation to the old Treatment Plant, a new dosing line will traverse the subject site along its western extent, connecting from the Sulphuric Acid Storage and Dosing

Facility Building. Additional dosing lines will connect from the Lime Storage & Dosing Facility Building to the existing water tanks at the old WTP.

8) Provision of additional car parking (to the rear / south of the 'old' / northern Treatment Plant Building), modification and extension of existing drainage, utility and services infrastructure and connections to serve and facilitate new and reconfigured buildings, and all other associated and ancillary development and works above and below ground level. This element of the proposed development relates to the provision of necessary facilitates for the proposed development, including an area of car parking adjacent the proposed workshop, provision of water and wastewater connections to the workshop, etc. In addition, the provision of surface water connections from the proposed buildings and hard surfaces is also proposed. Dosing lines throughout the wider site are not part of this element of the application.

1.7 Range of / Alternative Processes Considered

In terms of processes / methodologies to achieve the proposed enhancements, i.e. enhanced coagulation and pH control, to address the EPA direction, a number of approaches have been considered as part of the design of the proposed development as part of a study undertaken by Ryan Hanley which investigated the use of different pH correction chemicals.

This comparison yielded considerably lower OPEX costs for Lime (& Acid) Dosing, resulting in significant savings, when compared with the dosing of a 25% Sodium Hydroxide (NaOH) or a Sodium Carbonate (Na_2CO_3) solution (Nos. 2 & 3 below), based on the relative cost of the respective chemicals, amongst other factors / traits of each option, as follows:

1. **Lime Dosing**

- Lime dosing results in a considerably lower operational cost, with lime costing in the region of 20% of the cost of the other chemicals mentioned;
- The required daily volume of lime is 21m^3/d and requires a bulk storage volume of 350m^3 for 16.5 days storage (the minimum requirement to efficiently operate the WTP);
- Alternative silo orientations were not possible due to the volume of storage required and the importance of maintaining vehicular access at the rear of the facility;
- Alternative placement of the dosing facility was not feasible due to the requirement of lime storage and dosing facilities being located proximal to final water blending location to obviate the calcification and blocking of dosing lines.

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2. **Sodium Hydroxide**

- The required daily volume of 25% Sodium Hydroxide (NaOH) is in excess of 31m^3/d and would require a bulk storage volume in excess of 445m^3 for only 14 days storage;
- This storage volume is not practical as it would require a large number of bulk storage tanks installed internally, which would require an extensive area for construction;
- Dosing NaOH is more favourable over sodium carbonate (Na_2CO_3) due to it being in a liquid form, and has similar operational costs.

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3. **Sodium Carbonate**

- The required daily volume of Na_2CO_3 is in excess of 34,000kg and would require a bulk storage volume in excess of 750m^3 for only 14 days storage.
- The installation would require 3 No. 275m^3 silos with 3 associated batching tanks, a considerably larger installation than the proposed lime dosing facility. The spatial constraints at Leixlip WTP would not allow for the installation of such a facility.

4. **CO_2 Stripping**

The option of CO_2 stripping from the combined treated water, was discounted as a feasible option for the following reasons:

- Requirement for a new separate pre-pH correction Pump Sump for the blending of treated water and a new adjacent pumping station to pump the treated water to the top of 12m high packed towers.
- The spatial constraints in the area and the existing labyrinth of adjacent underground pipework, constricting the location of a required new pre-pH correction Pump Sump and Pumphouse.
- The probable risk of carbonate scaling within the CO_2 stripping towers, which can cement the media due to the high alkalinity in Leixlip raw water and the elevated residual carbonate alkalinity remaining in settled water, post coagulation.

The Lime Dosing approach was determined to be the optimum solution in the context of the requirements of the Leixlip Treatment Plant complex, in terms of:

- Being the 'Best Available Technique' (as is a widely recognised benchmark in such circumstances) [1];
- Requiring a relatively limited scale of physical development and material storage compared to other approaches; and,
- Involving a significantly lower cost than other options, the alternative scenario of higher costs representing a significant opportunity cost in terms of delivering on a significant infrastructure enhancement strategy.

The following Table illustrates the principal features of each option for reference. This clearly illustrates the substantial advantages of the selected Lime (& Acid) Dosing option, being generally the smallest physical intervention on site for the greatest return (e.g. in terms of storage duration for instance).

Table 1: Comparison of Options

Process Type	Cost	Storage Volume Required	Storage Duration	Development Footprint
Lime Dosing	Low	350 m^3	16.5 days	Medium
Sodium Hydroxide	High (c. 5-fold)	445 m^3	14	Large
Sodium Carbonate	High (c. 5-fold)	750 m^3	14	Large
CO_2 Stripping	High	N/a	N/a	Large

[1] Noted for instance by the EPA as " the most effective technique available to a particular industry sector to achieve a high general level of protection of the environment" - https://www.epa.ie/our-services/licensing/industrial/industrial-emissions-licensing-ied/industrial-emissions-licensing-process-explained-/bat--bref--cid/

1.8 Overview of the Proposed (Acid & Lime Dosing) Process

1.8.1 Acid Dosing Building

The re-establishment of alkalinity suppression / pH adjustment of raw water at the pre-coagulation stage of the treatment process, using acid dosing, will be required to facilitate optimal pH adjustment and reduction of natural organic matter in the raw water.

- At present, neither the Old or New Leixlip WTPs have operational acid storage and dosing facilities;
- Re-commissioning the acid storage and dosing installation at Old Leixlip WTP was investigated but deemed not to be feasible or safe due to the spatial constraints within the existing building, the inadequate size of the facility and the distance from this location to the raw water pipelines at New Leixlip WTP, which would increase the risk of leakage unnecessarily;
- As both WTPs abstract raw water from the same Intake, one sulphuric acid dosing installation, dosing both WTPs, reduces the extent of construction required, offers economy of scale and is the most economically advantageous option for Irish Water as a regulated water utility;
- The design of a new building allowed for the incorporation of necessary health and safety mitigation measures, addressing the risks of working with 96% sulphuric acid. The proposed acid storage and dosing facility will give a bulk storage duration of 16.5 days[2]. The proposed location was identified as being optimal for dosing of both WTPs and would utilise available land.

The acid dosing lines will connect from the Acid Building to the existing raw water intake line as illustrated on the enclosed drawings.

As such, the appropriate and optimum location for same is as close as possible to the inlet point from the River Liffey, which is in close proximity to this proposed element. The siting of the proposed building adjacent the new treatment plant, on an available area of land within the existing complex is the appropriate solution in our opinion, and will result in a minimal effect on the surrounding area, and will require the minimum of re-routing of raw water to the new and old treatment plants.

It should also be noted that this (southern) part of the site offers ample capacity for development, due its location in a heavily screened area well separated from surrounding non-infrastructure uses.

1.8.2 Lime Dosing Building and Storage Silos

Post treatment, pH correction is necessary to reduce the potential corrosivity of the final drinking water, pumped from both WTPs, thereby mitigating the dissolution of metals within the distribution network.

As both the Old and New Leixlip WTPs discharge treated water to the pump sumps beneath the main Pumping Station at the Old WTP (see Figure 4 above), one storage and dosing installation, dosing treated water from both WTPs, similarly reduces the extent of construction required, offers economy of scale and makes economic sense. Multiple smaller installations throughout the site are not feasible due to duplication of resources and the associated significant additional costs.

The lime dosing lines will connect from the lime building at the end of the treatment process as illustrated on the enclosed drawings and as elaborated on below.

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[2] The storage capacity of the Acid and Lime dosing elements (and discounted alternative processes) is an important operational consideration. For instance, in order to maintain continuity of service in the long term whilst allowing for holiday periods, extreme weather events, supply chain lead in times, etc. a certain reserve is required on site at all times. 16.5 days has been determined as the targeted volume of storage for this process, which for instance would not be achievable using other processes (as discussed in Section 1.6).

The Lime Dosing building and storage tanks have very particular design and location parameters, as follows:

a. The lime 'dosing' must occur at the 'end' of the treatment process, after treated water departs both the new and old treatment plants, with the subject location being immediately adjacent to the existing network of pipelines from both plants;[3]
b. No other location in the overall site is in proximity to the existing network of pipelines from both plants, see Figure 3;
c. Owing to the process characteristics, the proximity of the Lime Dosing point in the process is of importance, insofar as the dosing point must be as short as possible from the lime makeup tanks to the dosing injection points to avoid system blockages (see Figure 3);
d. The existing (disused) High-Lift Pump Hall within the 'old' / northern Treatment Plant Building provides an opportunity to reuse vacant floorspace within the plant, minimising the extent of new buildings required;
e. Having regard to the almost totally developed nature of the site in the northern area of the site, the presence of substantial utility and, topography constraints, the proposed position of the Lime Dosing building and storage tanks is the optimal approach;
f. Alternative locations, e.g. to the south of the old treatment plant, would not be technically feasible due to the narrow area between existing buildings and the site boundary, with topographical and infrastructural constraints precluding the possibility of extending the site footprint, as discussed in Section 2.0 illustrated on Figures 5 & 6 below;
g. Alternative designs, e.g. lower buildings and/or tanks would also not be feasible due to the limited site area and the resultant significantly increased footprint that would be associated with a series of smaller tanks;
h. Similarly, the configuration of the building and external tanks is fixed, in terms of overall proportions, i.e. a narrower more linear arrangement would not achieve the operational requirements in terms of the Lime Dosing process;
i. In addition, the introduction of a basement element has been considered however this is not feasible due to a number of factors including cost, constructability (in terms of excessive disturbance to ground / excavation and site constraints in terms of proximity of buildings and vehicular routes), etc.; and,
j. The siting, design and finishes of the proposed building has been chosen to assimilate with the existing scale and massing of the treatment plant buildings, with the height of the proposed building slightly below that of existing buildings;
k. The proposed tanks are an integral part of the proposed process and their principal volume will also be below the height of existing buildings.[4] and,
l. The design team have incorporated appropriate mitigation to seek to address any impacts arising from the scale and mass of the proposed facility, and in particular through provision of a screen to the proposed silos, to render a more conventional form to the public demise (as elaborated on in Section 4.5 below).

Having regard to the above, and the further justification of the proposed development and demonstration of consistency with policy below, we consider that this element of the proposed development is entirely proportionate and reasonable.

[3] For the avoidance of doubt, each of the alternative processes considered in Section 1.7 above would be comparably constrained, due to the essential requirement for this process element to be within close proximity to the end of the water treatment process.

[4] The railings to the proposed tanks are an essential health and safety requirement. They exceed the parapet line of existing buildings on site, however and the railings are unobtrusive and will have minimal potential visible impact as noted in the enclosed Architectural Design Statement.

1.8.3 De-Alkalisation Plant

The third part of the process relates to de-alkalisation of the raw water supply. Leixlip WTP takes its raw water supply from the River Liffey which has a moderate to high background alkalinity. Due to the residual alkalinity levels in water post-treatment, the potential for calcium carbonate deposition exists in treated water at Leixlip WTP.

To offset the risk of calcium carbonate deposition, when correcting pH at Leixlip WTP, and subsequent potential blocking of dosing lines, it is necessary to install a de-alkalisation facility to provide de-alkalised water for dilution and make up lime.

In order to reduce pumping costs and operational issues, it is more favourable to locate the de-alkalisation facility close to the lime make up tanks.

The old high lift pump room (currently disused) has been identified as a suitable location for the de-alkalisation facility in terms of its proximity to the lime dosing facility and also its proximity to the treated water lines from where it will take its supply.

1.9 Temporary / Enabling Works

As noted above, a number of temporary works may be necessary in terms of the construction of the proposed development, in the context of ensuring a continued operation of the site as a water treatment plant and otherwise to ensure an efficient and safe construction process. The following temporary works are envisaged in order to develop the outlined permanent works:

- Sheet piling and bracing at the Lime Building area may be required – the silos are to be placed in a depressed bund, approximately 1m below existing ground level, in order to minimise the height of the structures;
- Works Compound – there shall be 1 No. compound;
- Temporary heras type security fencing shall be erected on all works zones and public interfaces;
- A Temporary Traffic Management Plan (TTMP) will be developed at construction stage to manage construction traffic access & egress from the site;
- Trench boxes may be required for ducting runs and pipelines. Localised dewatering of trenches may be required at construction stage. All dewatering arising from the excavations will be passed through siltation boxes and silt bags with the filtered water outlet discharging to the local sewer network;
- Spoil will be removed off-site as required by a licensed haulier to a licensed waste facility.

For the avoidance of doubt, the precise details of the construction stage would be set out in a Construction and Environmental Management Plan (CEMP) in accordance with best practice standards, which would typically be agreed with the local Planning Authority prior to commencement of development in the event of a grant of permission. An outline CEMP is enclosed as part of this planning application.

2 SITE CONTEXT

2.1 Leixlip Water Treatment Plant

As noted above, the Leixlip Water Treatment Plant complex is located along the banks of the River Liffey within the functional area of South Dublin County Council, and extends to the south to the M4 motorway and to the north to the R148 Leixlip Road. The Old and New Treatment Plants are annotated in Figure 4 below.

The overall lands within the control of the Applicant comprise 18.98 hectares[5], whilst the area subject to the proposed development measures 0.65 hectares.

In this regard, we note that the planning application red line boundary is not contiguous, as is appropriate given the discrete footprints of works proposed as part of the planning application, so as to clarify that the balance of the site will not be subject to the planning application works and development.

To the west the overall site bounds the River Liffey and adjoining ESB lands which includes a Hydroelectric Dam (annotated in Figure 5 below) and attendant grounds and buildings, and a public road connecting to the R148 Leixlip Road to the north and the L5069 Cooldrinagh Lane to the east.

A portion of the site adjoins the Salmon Leap Inn (a protected structure, annotated in Figure 5 below), and a residential property to the north (annotated in Figure 5 below). The site bounds agricultural lands to the east, with an ESB 38 Kv Substation being located adjacent the site entrance along the Leixlip Road (annotated in Figure 5 below), with a resultant network of powerlines traversing the area (south of the old WTP). Ground levels rise significantly from the rear of the Old WTP to the south, towards recorded archaeological features, before falling again towards the new WTP.

The substantial topographical and archaeological features in the area have had the effect of splitting the overall complex into two main zones, detailed as follows.

[5] As noted above, the overall site is currently in the ownership of Fingal County Council, with a transfer of relevant lands to Irish Water in progress.

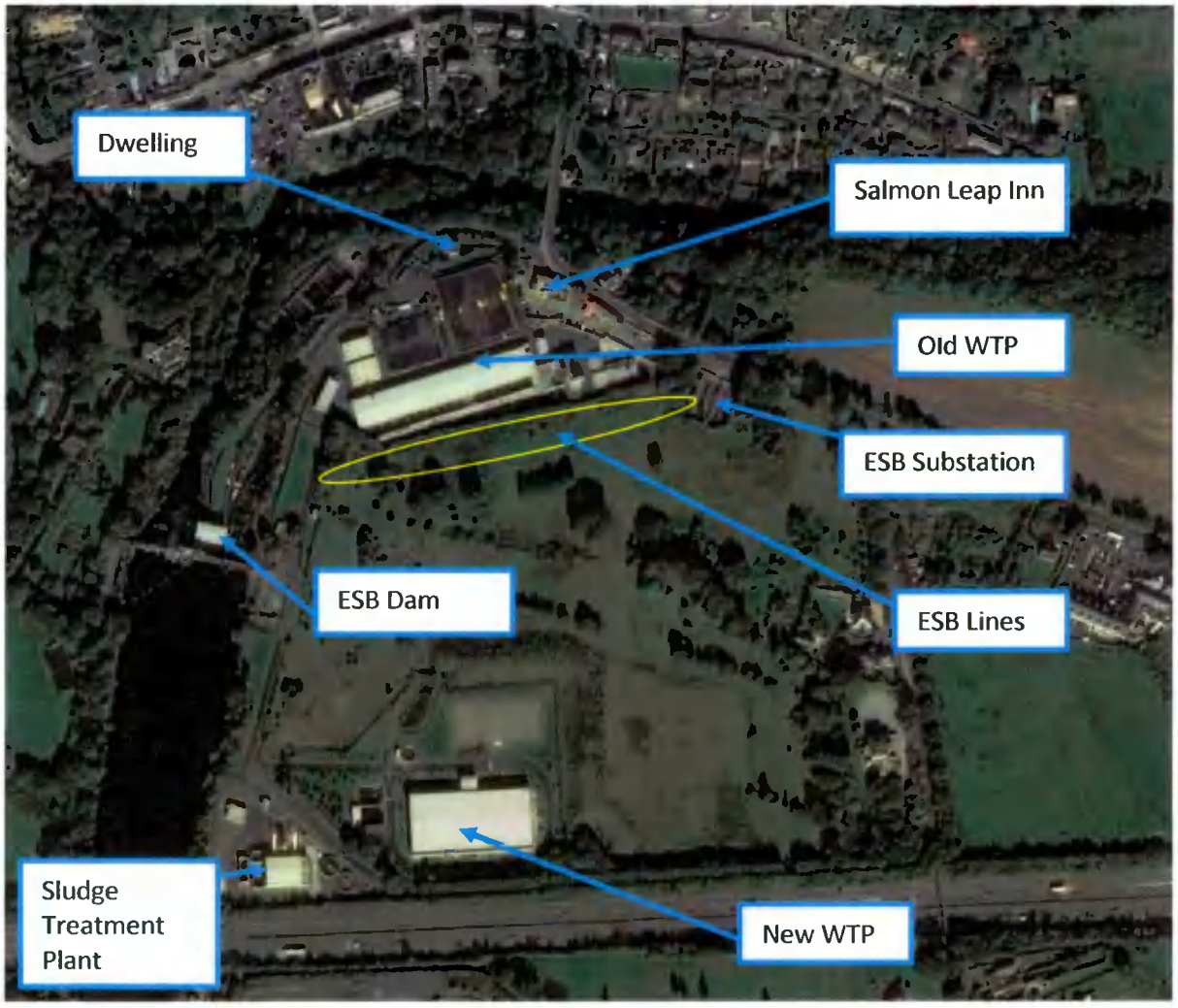

Figure 5: Leixlip Water Treatment Plant Complex (Source: Google Maps)

2.2 Old / Northern Treatment Plant Area

The old Treatment Plant is located to the north of the site and is arranged within a cluster of buildings / structures related to the water treatment process.

Elements of the proposed development will be located in this area, including the Lime Storage & Dosing Facility Building, De-Alkalisation Plant (within the existing structure), the new Workshop Building, and associated plant and equipment along with the demolition of the existing Workshop and (defunct) Activated Carbon Building, as detailed in Section 1.6 above.

Figure 6 illustrates these works in the context of the adjoining buildings and infrastructure at the Old Treatment Plant.

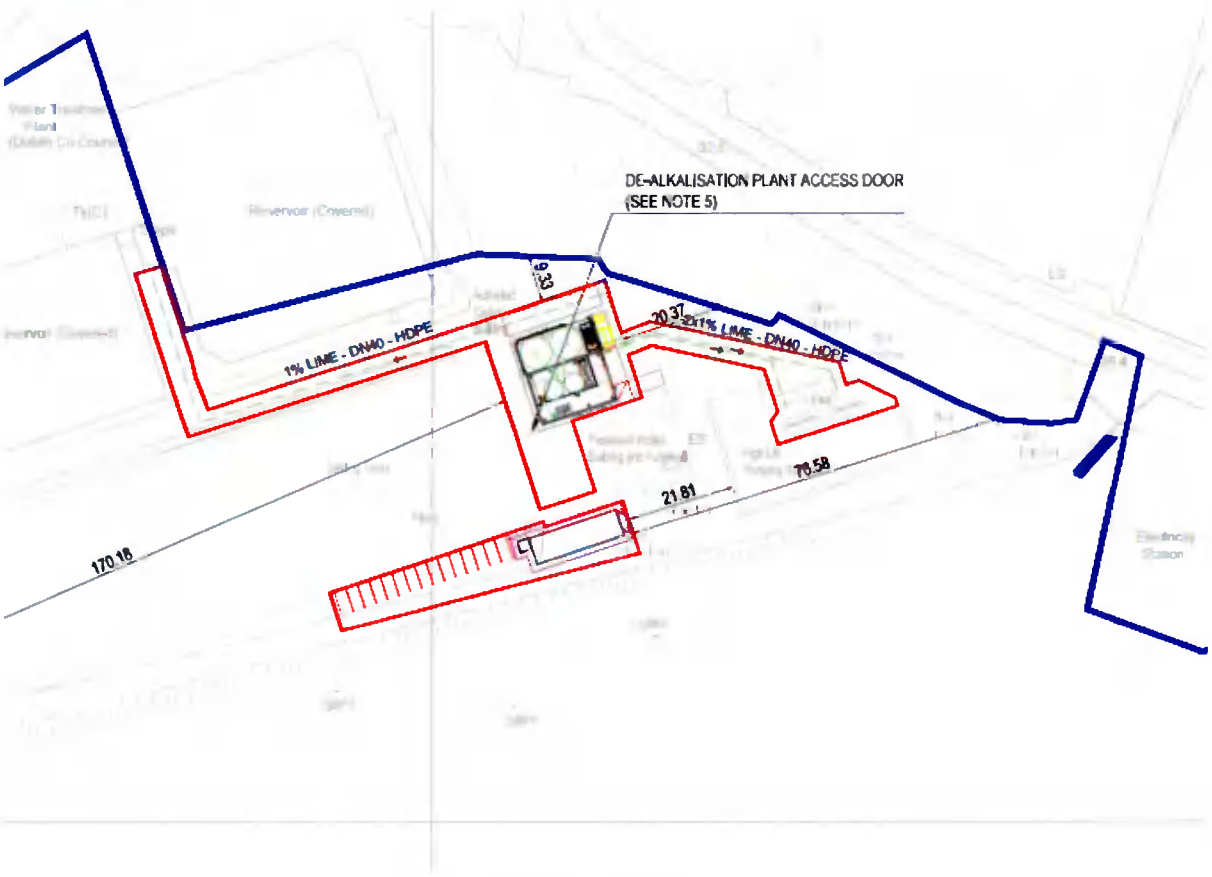

Figure 6: Old Treatment Plant Environs - excerpt from Planning Drawing No. 11118-RHL-LP2-XX-DR-PL-0003

2.3 New / Southern Treatment Plant Area

The New Treatment Plant is a modern addition to the treatment plant site, being constructed in recent years (see Section 2.5 detailing the planning history of the site), to the south of the overall site, adjacent to the 'raw' water inlet infrastructure and the Sludge / Treatment Plant / Dewatering Facility. This part of the complex is isolated in nature due to boundaries of the site formed by the M4 to the south, the River Liffey to the west and agricultural lands to the north and east.

Elements of the proposed development will be located in this area, primarily including the Sulphuric Acid Storage and Dosing Facility Building.

Figure 7 illustrates these works in the context of the adjoining buildings and infrastructure at the New Treatment Plant.

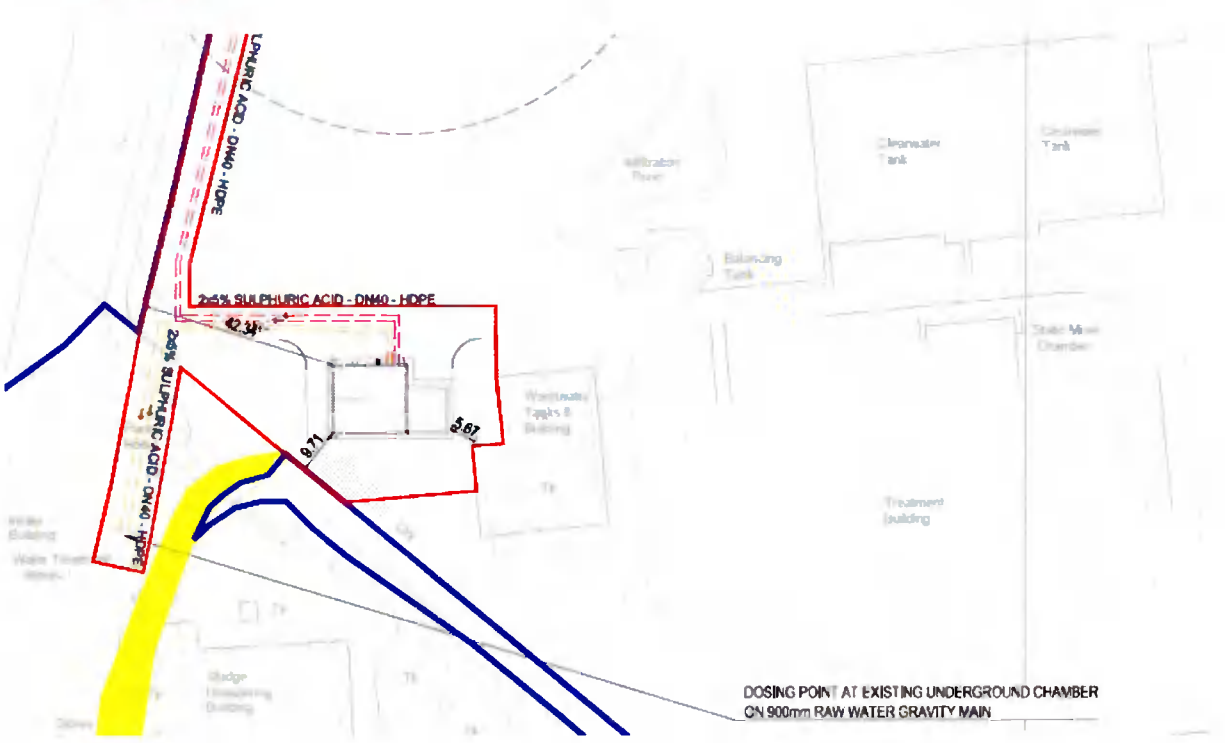

Figure 7: New Treatment Plant Environs - excerpt from Planning Drawing No. 11118-RHL-LP2-XX-DR-PL-0003

2.4 Pipeline Network Throughout the Site

There is an existing network of pipelines and services throughout the overall site, which the proposed development has been necessarily designed to be compatible with, in terms of key nodes of activity where the proposed process elements will tap into.

For instance, as noted above, the Lime Dosing Facility is required to be particularly close to the point at which treated water from each of the WTPs converge.

Similarly, the Sulphuric Acid Storage and Dosing Facility Building is located to be in proximity to the raw water inlet (see Figure 3).

The dosing lines / connections from the proposed new process steps are illustrated on the enclosed drawings.

2.5 Planning History

Table 2 below lists the planning history of the site available from a review of the planning register in relation to the overall Treatment Plant site.

We note that Planning Ref's: S96A/0027 & S98A/0074 relate to the existing Sludge Dewatering Plant, which is unaffected by the proposed development and is a standalone piece of infrastructure, independent to the subject proposal.

Reg. Ref's: S96A/0205 and S96A/0028 are also understood to be unaffected by the proposed development being relatively stand-alone elements of infrastructure.

S00A/0230, which was not implemented / constructed, permitted a two-storey building / extension in a similar position to the proposed Lime Dosing Building (as illustrated in Figure 7 below), demonstrating the suitability of the construction of additional structures in this area of the site.

The remaining permissions generally relate to the development of the new Treatment Plant. Reg. Ref: SD04A/0981 was withdrawn whilst SD06A/0500 lapsed and was superseded by SD10A/0130. The new Treatment Plant was implemented and constructed under the latter permission, Reg. Ref: SD10A/0130.

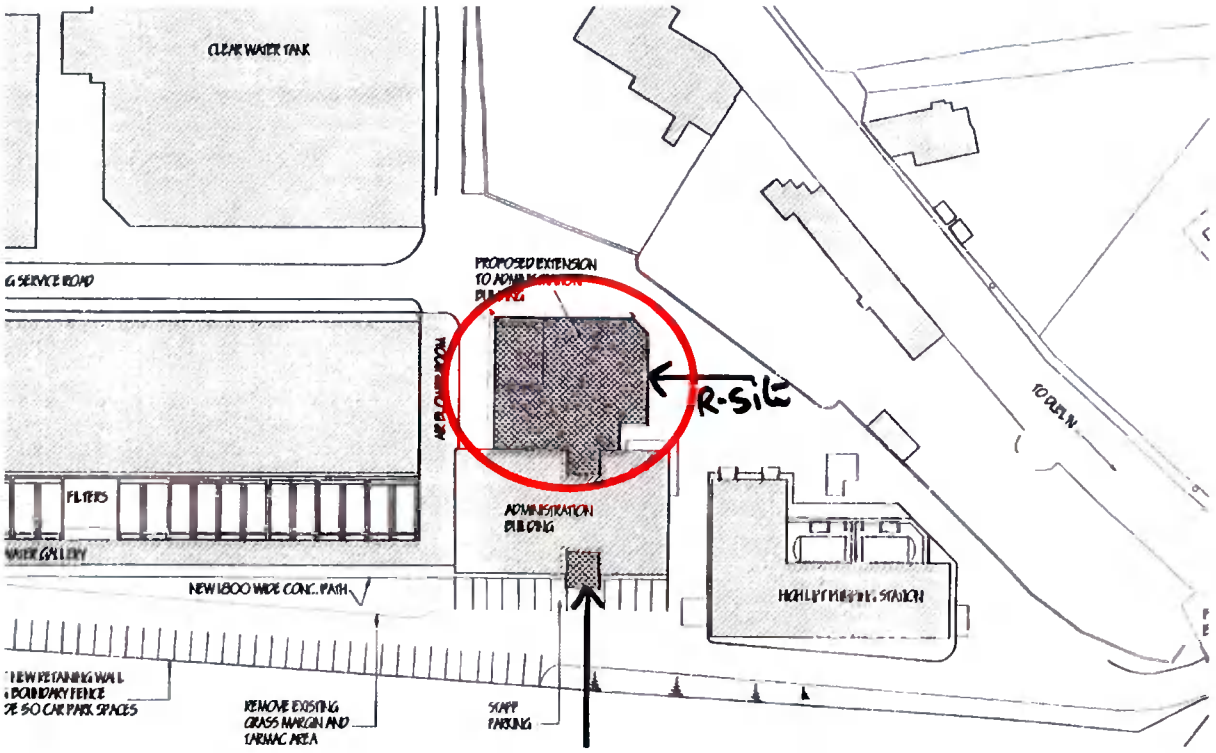

Figure 7: Previously Permitted Two Storey Structure - South Dublin County Council Planning Ref: S00A/0230

The planning history demonstrates a long-established presence on site in terms of water treatment activities, which have evolved and been upgraded over time, with the subject proposal being a continuation of this pattern.

Table 2: Planning Register History

Ref	Description	Outcome
S96A/0205	Construct a 700mm diameter underground watermain together with twin 80mm diameter foul sewage rising mains and associated pump sump.	Grant
S96A/0027	Construct a Sludge Treatment and Dewatering Plant. The proposed development includes 3 no. 1440 cub.m. Filter Washwater Recovery Tanks, a 460 cub.m. Sludge Collection and Balancing Tank, 2 No. 125 cub.m. Sludge Thickening Tanks, 3 no. 320 cub.m. Sludge Holding Tanks, a 95 sq.m. Washwater Pumping Station, a 55 sq.m. Sludge Pumping Station, a 1540 sq.m. Sludge Dewatering Building, associated pipework and general siteworks.	Grant
S96A/0028	Construct a 18,250 cubic metre Clearwater Reservoir, a 572 sq.m. High Lift Pumping Station, associated pipe work and general siteworks.	Grant
S98A/0074	Modifications to dewatering plant with the addition of a 103 cubic metre storage vessel	Grant

S00A/0230	Alterations and extensions to the existing main administration building. The development will provide additional offices, laboratories and welfare facilities and will also incorporate a Regional Training Centre. The proposed development includes for the following items: (1) Demolition of existing workshop and toilets (69m2). (2) Change of use of existing laboratories and pump hall to training rooms. (3) Alterations to the existing administration building incorporating the provision of new entrance foyer, reception area, conference room, lecture hall and training rooms. (4) Alterations to the eastern elevation of the existing main administration building. (5) The construction of a two storey extension to the main administration building (714m2) incorporating offices, laboratories, workshop, store and associated facilities. (6) The construction of a new retaining wall along the southern boundary. (7) Provision of car parking spaces, general site works and associated site services.	Grant
SD04A/0981	Construction of 1 no. Flashmixer, sedimentation tanks, filters and ancillary works building, 1 no. Clearwater tank, 2 no. Washwater recovery tanks, 1 no. Balancing tank, 2 no. Sludge holding tanks 1 no. stores building; ancillary chambers and pumping stations; associated site development works with all services connected to the public services at this location. It is proposed to construct a temporary construction compound and site offices and a temporary construction access road for the duration of the construction period. The proposed development shall be of a category listed in the European Communities (Control of Major Accident Hazards involving Dangerous Substances) Regulations, S.I. no. 476 of 2000.	Withdrawn
SD06A/0500	Construction of (1) main treatment building including sedimentation tanks, filters, 1no. Flash Mixer, internal ESB substation, chemical storage and plant machinery, (2) 2no. sludge holding tanks, (3) 1no. clearwater tank, (4) 2no. washwater recovery tanks, (5) 1no. balancing tank, (6) 1no. stores building, (7) associated site development works and interconnecting pipework with all services connected to existing public services, (8) ancillary chambers and pumping stations, (9) infiltration pond to handle surface water run-off. It is proposed to construct a temporary construction compound and site offices for the duration of the construction period. An existing entrance immediately south of Leixlip Bridge on the R148 Leixlip Road will be used during construction.	Grant
SD10A/0130	Construction of the following elements: Main Treatment Building including: Sedimentation Tanks; Filters; 1 no. Flash Mixer; Internal ESB substation; Chemical Storage and Plant Machinery; 2 no. Sludge Holding Tanks; 1 no. Clearwater Tank; 2 no. Washwater Recovery Tanks; 1 no. Balancing Tank; 1 no. Stores Building; associated site development works and interconnecting pipework, with all services connected to existing public services at this location; ancillary chambers and pumping stations; 1 no. infiltration pond to collect the surface water run-off from the proposed site, supernatant from washwater recovery tanks and overflow from the Clearwater tank and New Flash mixer and scours (the pond shall drain to the existing site surface water system). It is proposed to construct a temporary construction compound and site offices for the duration of the construction period. An existing entrance immediately south of Leixlip Bridge on the R148 Leixlip Road will be used during construction.	Grant

3 NATIONAL & LOCAL PLANNING CONTEXT

3.1 Water Services Strategic Plan, 2015

Irish Water's Water Services Strategic Plan details the long-term strategy for investment in and delivery of water services up to 2040. In particular, the following Strategic Objectives and Aims arise:

- *"WS1 Manage the sustainability and quality of drinking water from source to tap to protect human healthWS2 Manage the availability, sustainability and reliability of water supply now and into the future.*
- *WS3 manage water supplies in an efficient and economic manner.*
- *SG1 Support national, regional and local economic and spatial planning policy. SG2 Facilitate growth in line with national and regional economic and spatial planning policy. SG3 Ensure that water services are provided in a timely and cost-effective manner.*
- *IF1 Asset Management. Manage our assets and investments in accordance with best practice asset management principles to deliver a high quality secure and sustainable service at lowest cost;*
- *IF2 Balanced Sustainable Investment. Invest in our assets while maintaining a sustainable balance between meeting customer standards, protecting the environment and supporting the economic development and growth of the country."*

In relation to 'Providing Safe Water Supplies' the Strategy also notes:

> *"Meeting the EU and Irish drinking water quality standards for all of our water supplies is a significant challenge...*
>
> *Water supply within our cities and large towns does not meet international norms for available headroom. Headroom is the spare capacity of all infrastructure (abstractions, treatment plants, pumps and networks). This spare capacity is used in the event of adverse weather conditions or during unplanned incidents such as breaks in trunk mains or problems at a water treatment plant. Planning for resilient water supplies must also take place, independently of any progress in demand management (reducing unnecessary use of water) or success in reducing leakage, because loss of a key water source, treatment plant, or pipeline remains a separate risk to be managed..."*

The proposed development is intended to improve the existing water treatment process at the existing WTP in line with Irish Waters objectives, and mandate from government.

3.2 National Development Plan

The National Development Plan was published in 2018 and is intended to set out capital spending objectives and ambitions up to 2027.

Substantial investment in water infrastructure is targeted as part of this plan, in particular under *National Strategic Outcome 9 - Sustainable Management of Water and other Environmental Resources*. The Plan projects spending of €8.5 billion in relation to Irish Water spending, and notes for instance that:

> *"Ireland's water and wastewater network comprises a vast network of fragmented assets in varying states of repair with some dating from the 19th century. The upgrading of these networks will take sustained capital investment by Irish Water over many investment cycles in order to deliver efficient, fit-for purpose water infrastructure and services to meet Ireland's needs."*

The proposed development forms an important part of the objective to *deliver efficient, fit-for purpose water infrastructure and services to meet Ireland's needs*, particularly in the context of the Leixlip WTP being a particularly important facility serving a significant catchment population.

3.3 National Planning Framework

The National Planning Framework (NPF) similarly highlights the importance of investment in water infrastructure nationally and regionally, for instance, among the *"Key future growth enablers for Dublin"* the NPF refers to:

> *"Ensuring that water supply and waste-water needs are met by new national projects to enhance the city's and the wider Greater Dublin Area's water supply and increase waste water treatment capacity"*

The NPF also contains National Policy Objective 63 which aims to:

> *"Ensure the efficient and sustainable use and development of water resources and water services infrastructure in order to manage and conserve water resources in a manner that supports a healthy society, economic development requirements and a cleaner environment."*

The NPF also includes National Strategic Outcome 9 - Sustainable Management of Water and other Environmental Resources which inter alia notes that *"Investment in water services infrastructure is critical to the implementation of the National Development Plan."*

The proposed development forms an important and necessary enhancement of Leixlip WTP, and as such is entirely in keeping with the objectives and priorities of the National Planning Framework.

3.4 Draft Water Services Guidelines, 2018

We note that Draft Ministerial Guidelines have been published by the Department of Housing, Planning and Local Government in January 2018, and whilst not formally adopted to date, provide some useful guidance on Water Services issues, if only to clarify or reaffirm general pre-existing principles in terms of the appropriate assessment of infrastructure proposals, etc. The Draft Guidelines note for instance:

> *"The establishment of Irish Water created a new water services utility that is responsible for advancing a national programme with regard to planning for and investing in water services across the country. This includes provision of new assets, the upgrade and replacement of strategic infrastructure assets to ensure operational efficiencies and environmental compliance, while also catering for growth.*
>
> *In principle the use of the design and build approach should continue to be allowed by planning authorities when assessing proposals made by Irish Water. In making planning applications Irish Water will typically expected to provide a description of the development to include, for example:*
>
> - *The physical size of various components – such as the maximum height and volume of tanks, buildings etc. (often this will include the maximum or "worst case" dimensions) and the likely building materials and finishes;*
> - *The approach to construction, including the likely method of work, hours of operation etc.;*
> - *How matters such as access, landscaping, lighting, fencing and signage will be addressed; and*

- *Environmental parameters - capacity, phasing, and depending on the scale of the facility, likely maximum levels of emissions to air, noise, odour etc. and discharges to water.*

Any design approach to development permitted shall be materially compliant with the planning permission. In this regard active engagement is recommended between the planning authority and Irish Water, where appropriate."

The proposed development primarily relates to *the upgrade and replacement of strategic infrastructure assets to ensure operational efficiencies and environmental compliance*, whilst the design of the proposed development has been undertaken to a detailed stage to date, and as such no particular flexibility in terms of the scale of buildings or structures is considered necessary.

It should be noted however that the internal layout and equipment profile of proposed buildings and structures is somewhat indicative and would be subject to evolution over time, as with any complex process.

3.5 South Dublin Development Plan 2016-2022

The proposed development is subject to the existing South Dublin Development Plan. As detailed in Section 4.1 below, the site is zoned under Objective HA (LV) – *"To protect and enhance the outstanding natural character and amenity of the Liffey Valley."*

The Development Plan influences development under other policies and objectives, and general observations, including but not limited to the following:

"The achievement of the Core Strategy is intrinsically linked to the delivery of concurrent water and drainage infrastructure by Irish Water to serve the priority growth locations. As such, the investment programme of Irish Water is a key influence on the achievement of the Core Strategy.

The availability of high-quality infrastructure networks and environmental services is critical to securing economic investment, creating sustainable and attractive places, in ensuring health and well-being and in safeguarding the environment.

INFRASTRUCTURE & ENVIRONMENTAL QUALITY (IE) Policy 1 Water & Wastewater

It is the policy of the Council to work in conjunction with Irish Water to protect existing water and drainage infrastructure and to promote investment in the water and drainage network to support environmental protection and facilitate the sustainable growth of the County.

- *IE1 Objective 1: To work in conjunction with Irish Water to protect, manage and optimise water supply and foul drainage networks in the County.*
- *IE1 Objective 2: To work in conjunction with Irish Water to facilitate the timely delivery of ongoing upgrades and the expansion of water supply and wastewater services to meet the future needs of the County and the Region."*

The proposed development is clearly consistent in principle by the existing Development Plan, which strongly supports improvements to water infrastructure such as the Leixlip WTP.

Other particularly relevant policies relate to heritage and landscape conservation, including as follows:

"HERITAGE, CONSERVATION AND LANDSCAPES (HCL) Policy 2 Archaeological Heritage

It is the policy of the Council to manage development in a manner that protects and conserves the Archaeological Heritage of the County and avoids adverse impacts on sites, monuments, features or objects of significant historical or archaeological interest.

HCL2 Objective 1: To favour the preservation in-situ of all sites, monuments and features of significant historical or archaeological interest in accordance with the recommendations of the Framework and Principles for the Protection of Archaeological Heritage, DAHGI (1999), or any superseding national policy document.

HCL2 Objective 2: To ensure that development is designed to avoid impacting on archaeological heritage that is of significant interest including previously unknown sites, features and objects.

HCL2 Objective 3: To protect and enhance sites listed in the Record of Monuments and Places and ensure that development in the vicinity of a Recorded Monument or Area of Archaeological Potential does not detract from the setting of the site, monument, feature or object and is sited and designed appropriately."

As detailed in Section 4.9 below, the proposed development has been designed and laid out with particular regard to archaeological constraints, as has development on the overall site in recent years, for instance the siting of the 'new' Treatment Plant.

The enclosed Archaeological Assessment demonstrates that the proposed development is in accordance with archaeological best practice insofar as is possible having regard to the essential nature of the proposed works.

In relation to landscape policies, in addition to the zoning objective as detailed in Section 4.1, we note:

HERITAGE, CONSERVATION AND LANDSCAPES (HCL) Policy 10 Liffey Valley and Dodder Valley

It is the policy of the Council to protect and enhance the visual, recreational, environmental, ecological, geological and amenity value of the Liffey Valley and Dodder Valley, as key elements of the County's Green Infrastructure network.

- *HCL10 Objective 1: To restrict development within areas designated with Zoning Objective 'HA – LV' (To protect and enhance the outstanding character and amenity of the Liffey Valley) ... and ensure that new development is related to the area's amenity potential and is designed and sited to minimise environmental and visual impacts.*
- *HCL10 Objective 2: To ensure that development within the Liffey Valley and Dodder Valley will not prejudice the future creation and development of uninterrupted and coherent parklands including local and regional networks of walking and cycling routes.*
- *HCL10 Objective 3: To ensure that development proposals within the Liffey Valley and Dodder Valley, including local and regional networks of walking and cycling routes, maximise the opportunities for enhancement of existing ecological features and protects and incorporates high value natural heritage features including watercourses, wetlands, grasslands, woodlands, mature trees, hedgerows and ditches, as part of the County's Green Infrastructure network.*
- *HCL10 Objective 5: To facilitate the development of Council-owned lands at Cooldrinagh and the Hermitage Clinic as publicly accessible parkland and Green Infrastructure links.*
- *HCL10 Objective 7: Within areas designated 'High Amenity – Liffey Valley' and 'High Amenity – Dodder Valley' non-residential development will only be permitted where it:*
    - *Relates to the area's amenity potential or to its use for agriculture or recreational purposes, including recreational buildings; or*
    - *Comprises the redevelopment of or extensions to existing commercial or civic uses or development of new commercial or civic uses within an existing established area of commercial or civic activity; and*
    - *Preserves the amenity value of the river valley including its landscape value, views or vistas of the river valley and its biodiversity value.*

The proposed development is considered to be compatible in principle with the above, particularly given that the development and works proposed will take place within an existing Water Treatment complex rather than on greenfield land.

In terms of Landscape Character, and the designations within the Landscape Character Assessment of South Dublin County (2015), which is separate to but supported by the Development Plan, the site is within the *Urban Landscape Character Area*, separate from the *Liffey Valley Character Area,* with the Leixlip Road being the boundary of the two Character Areas.

As such, adopted policy recognises that the subject site has an urban developed character, notwithstanding that development would in any event be required to adhere to normal landscaping and amenity principles, and the specific requirements of the zoning objective.

Finally, in relation to *HCL10 Objective 7*, we submit that the proposed development can be considered as an extension to an existing civic use, hence there is no barrier to the granting of permission for the proposed development in relation to this objective.

The proximity of the subject site to adjacent protected structures (in the case of the old Treatment Plant area) is also noted, with a number of policies and objectives as follows of note:

> *"HERITAGE, CONSERVATION AND LANDSCAPES (HCL) Policy 3 Protected Structures*
>
> *It is the policy of the Council to conserve and protect buildings, structures and sites contained in the Record of Protected Structures and to carefully consider any proposals for development that would affect the special character or appearance of a Protected Structure including its historic curtilage, both directly and indirectly.*
>
> *HCL3 Objective 1: To ensure the protection of all structures (or parts of structures) and the immediate surroundings including the curtilage and attendant grounds of structures contained in the Record of Protected Structures.*
>
> *HCL3 Objective 2: To ensure that all development proposals that affect a Protected Structure and its setting including proposals to extend, alter or refurbish any Protected Structure are sympathetic to its special character and integrity and are appropriate in terms of architectural treatment, character, scale and form. All such proposals shall be consistent with the Architectural Heritage Guidelines for Planning Authorities, DAHG (2011) including the principles of conservation."*

The visual and heritage amenities of the surrounding area is noted, in particular in relation to views and intervisibility of the old Treatment Plant complex, which is also addressed as part of the enclosed Landscape (and Visual) Impact Assessment as required under the zoning objective.

The proposed structures have been designed at the most minimal scale to achieve their necessary purpose, and also considering alternative locations and processes, as demonstrated in preceding sections of this report.

In our opinion, the proposed development appropriately balances the need for the development and improvements to the Water Treatment Plant whilst complying with policies and objectives of the Development Plan and the National Planning Framework.

It is acknowledged that the proposed Lime Dosing element will have an effect on the visual amenities of a localised area. However, it is considered that it is acceptable in the context of the broader established water treatment plant use on site, together with the essential public health need for the project, as supported by planning policy.

3.6 Land Use Zoning

As noted above, the subject site is zoned 'HA - LV': 'To protect and enhance the outstanding character and amenity of the Liffey Valley' where Public Services[6] are Open for Consideration subject to an acceptable Landscape Impact Assessment.

This application includes a *Landscape Impact Assessment* demonstrating that the proposed development would be acceptable.

Figure 9: Land Use Zoning of the WTP Complex (Proposed Development areas circled in red)

We note that the most recent permission on site, *Reg. Ref: SD10A/0130*, which was significantly larger in scale than the subject proposal, was deemed to be acceptable under a *Green Belt* zoning at that time, where *Public Services* were similarly *Open for Consideration*.

[6] Defined in the Development Plan as: *"A building or part thereof or land used for the provision of public services. Public services include all service installations necessarily required by electricity, gas, telephone, radio, telecommunications, television, drainage and other statutory undertakers, it includes: public lavatories, public telephone boxes, bus shelters, bring centres, green waste and composting facilities."*

The proposed development is therefore considered to be entirely compatible and consistent with the land use zoning of the site, and following a long-standing pattern of the development, renewal and/or reconfiguration of *public services* on the subject site.

3.7 Traffic & Transportation

In terms of traffic arising from the proposed development, no material change to the existing pattern of activity would arise.

Deliveries of (Sulphuric Acid and Lime) materials would occur on a periodic basis (approximately 5 movements per week), which would be a small proportion of overall existing delivery and other movements to and from the site (which are in the order of 15 - 20 movements per week). Specific delivery movements will be catered for by purpose-built delivery areas adjacent the Acid and Lime Dosing & Storage buildings. Drawings illustrating the delivery movements to each of these elements are enclosed with the planning application.

Staff movements would not be anticipated to alter as a result of the proposed development, with existing workplace patterns remaining largely as existing, i.e. no additional employment is envisaged on site.

Waste collections would similarly not materially alter as a result of the proposed development, with existing arrangements also remaining as existing.

In terms of the construction stage, as noted in the description of development specific measures would be provided to ensure a seamless construction process including a detailed Construction Management Plan and Traffic Management Plan, which would set out precise arrangements regarding construction stage traffic. As noted in Section 3.17 below, the final detail of same would typically be subject to a condition of planning permission.

3.8 Drainage & Water Supply

The proposed development will require modification to the existing surface water system on site, in terms of catering for the proposed buildings and hard surfaces. Drawings detailing same are enclosed.

In relation to foul drainage, no additional loading is anticipated, with only localised works proposed in terms of connecting the proposed Workshop to the network and otherwise diversion of existing on-site pipelines where required, as illustrated on the enclosed drawings.

Water supply will be provided to the buildings as required from the existing network within the site, with no new connections required.

3.9 Landscaping & Invasive Species

In terms of landscaping, the proposed development will have a relatively neutral effect, in that much of development will take place on previously developed areas, or will be easily absorbed within existing substantially landscaped areas.

In relation to the proposed workshop and car parking area, this will involve an expansion of the building footprint to the south of the existing Old WTP, however the existing landscaping buffer in this area will be unaffected and will be preserved post-development.

In relation to the De-Alkalisation Plant and Lime Dosing and Storage facility, this will take place within existing developed / hard surfaced areas devoid of vegetation, hence will have no effect on landscaping within the site. The nature of the site in the vicinity of this element precludes the provision of landscaping works, screening, etc. In relation to the proposed Acid Building, this will be located

within an existing landscaped area, within the environs of the New WTP, and will involve an element of removal of landscaping to accommodate the footprint of the proposal.

Remaining landscaping will surround / screen the proposed building, integrating it into the cluster of structures arranged at the new WTP. The enclosed layout and drawings illustrate the proposed development in context in this regard.

An Invasive Species Survey concludes: *"The findings of this study show Leixlip Water Treatment Plant (WTP) is free of invasive plant species regulated for in Statutory Instruments 477/2011 and 1143/2014; thus, an Invasive Species Management Plan will not be required prior to the commencement of works."*

3.10 Design & Visual Impact

In relation to design, the proposed development can be considered in five parts (with the location of each element annotated in Figure 10 below as appropriate):

1. **The works to the 'front' of the Old WTP (e.g. the Lime Dosing & Storage Facility, etc.)**

   The works to the front / north of the Old WTP, i.e. the Lime Dosing & Storage Facility contains two principal parts, comprising the building and the lime silo / tanks. As has been noted above, the design parameters are fixed due to both the treatment process requirements and the requirement to tie in with existing WTP infrastructure at specific locations.

   The height of these elements will match the existing height profile of buildings on site[7] and will occupy a comparable footprint to that of a previously permitted expansion of the site (*Reg. Ref: S00A/0230*).

   In terms of landscape, the LVIA concludes that *"the magnitude of change to the Landscape Character is considered Low (in its immediate environs) to Negligible in the wider Liffey Valley landscape. The landscape sensitivities range from Medium to High resulting in a landscape effect of Moderate & Adverse Importance. However this effect is primarily visual and very localised... The land use is already established and similar structures are present in the WTP site."* Therefore, it is reasonable to conclude that from a *landscape impact* perspective, the proposed development can be determined as being acceptable, and thereby consistent with the land use zoning objective.[8]

   It is acknowledged that the form, scale and location of the silos, without mitigation could be perceived as having an impact on certain street views (see enclosed Photomontages and LVIA). Three viewpoints were considered to be the most appropriate views to assess in terms of potential visual impact, with one view (no. 2) providing a sequence of views illustrating visibility whilst crossing the Leixlip bridge being *"representative of the views experienced by road users and pedestrians, and tourists at a very scenic location"*.

   Two of the views (nos. 1 & 3), which represent more oblique approaches / angles of the WTP footprint near the Leixlip Road, the visual impacts have been determined to be neutral, whereby the LVIA concludes the proposal as *"maintain[ing] landscape quality. (Although the*

[7] Save the safety railing, which is a relatively imperceptible element as noted in the Architectural Design Statement.

[8] In this regard we note the LVIA highlights an "ambiguity of extent of High Amenity zoning, which includes existing commercial lands south of Leixlip Road, and the LCA Liffey Valley which terminates at the Leixlip Road. Land south of this road is within the LCA Urban South Dublin which is a more appropriate representation of its current character and influences." This suggests that the site has a greater 'landscape' capacity for development than that suggested by the zoning objective.

quality of the view is poor)" and "the existing landscape quality / view is not of high value and is not degraded further by the development."

View (no. 2) and the associated sequence of views (no. 2a-2h), represent the view looking (and moving) south across the Leixlip Bridge towards the WTP to the rear of the Salmon Leap Inn. The LVIA describes the impact / effects as follows: *"The proposed new building and two screened silos are visible rising above and behind the public house in Views 2a – e. The architectural screening simplifies the form of the structures and ties it to existing adjacent elements in the view. Whilst prominent when furthest from the public house this prominence reduces as the building is approached and in Views 2f – h is no longer visible."*

The LVIA further concludes that the sequence of View no. 2a-2h *"...illustrates a change in visibility and therefore effect from Important and Adverse to Low Importance and Neutral and then no change. This reflects the typical movement experienced (by vehicles and pedestrians) along a road corridor albeit in a highly scenic and recognised location and corridor. Mitigation in the form of architectural screening has not reduced the visibility of the proposed development, however it has altered the more industrial language and character of the silos (now enclosed), to a more neutral, simple and acceptable form, where visible as a backdrop in the generally scenic composition of the pub, bridge and river landscape."*

These classifications should be interpreted and assessed in context and can be qualitative/subjective. For instance, the LVIA elsewhere states that: *"This is not an absolute exercise; in particular, visual receptors' attitudes to development, and thus their response to the impact of a development, will vary."*

In terms of design, the Taylor McCarney Architects have considered a number of design solutions and mitigation options as set out in Section 1.6. The LVIA and conclusions therein demonstrates that the design approach assists with minimising the impacts and effects of the proposed development.

As noted above, the building and storage silo dimensions and location are inflexible. The enclosed drawings and illustrations demonstrate the proposed building in context, highlighting that the scale of the building is limited relative to the substantial scale of the existing Treatment Plant complex.

Whilst the existing transition in character from the adjoining and adjacent properties to the WTP is relatively abrupt, this transition will be unchanged as a result of the proposed development, with the proposed structures being consistent in appearance and scale with the existing complex of buildings in this area, as highlighted in the LVIA where it states that *"the proposal would introduce two buildings into the landscape which may be prominent from localised viewpoints ... but also reflect existing uses in the immediate area."*

Having regard to the foregoing, we submit that the proposal is a proportionate response to the operational challenges arising at the subject site, has weighted regard to its setting, and should be permitted accordingly.

2. The works to the 'rear' of the Old WTP (e.g. the new workshop, etc.)

In relation to the proposed Workshop and associated car park area to the rear or south of the existing Old Treatment Plant, we note that these works will be substantially screened / obscured from public view by virtue of the existing Treatment Plant buildings. The workshop will be lower than adjoining buildings whilst its southern building line will not protrude past the existing southern building line of the adjacent High Lift Pumping Station.

3. **The internal works (e.g. the De-Alkalisation Plant)**

   The De-Alkalisation Plant will not result in any visual change as it will be enclosed within existing buildings and therefore no design or visual impact issues arise.

4. **The works around the New WTP (e.g. the Acid Dosing building)**

   In relation to the Acid Dosing Plant, the scale and context of the building, next to other larger industrial type buildings, along with substantial extant landscaping and screening, will ensure that the building assimilates with the existing local environment and that the design does not lead to any material impacts on the area, which is a relatively insensitive in terms of visibility from main routes in the area.

5. **The Underground Dosing Lines / Pipelines**

   The pipelines will be below ground hence will not result in any visual change and therefore no design or visual impact issues arise.

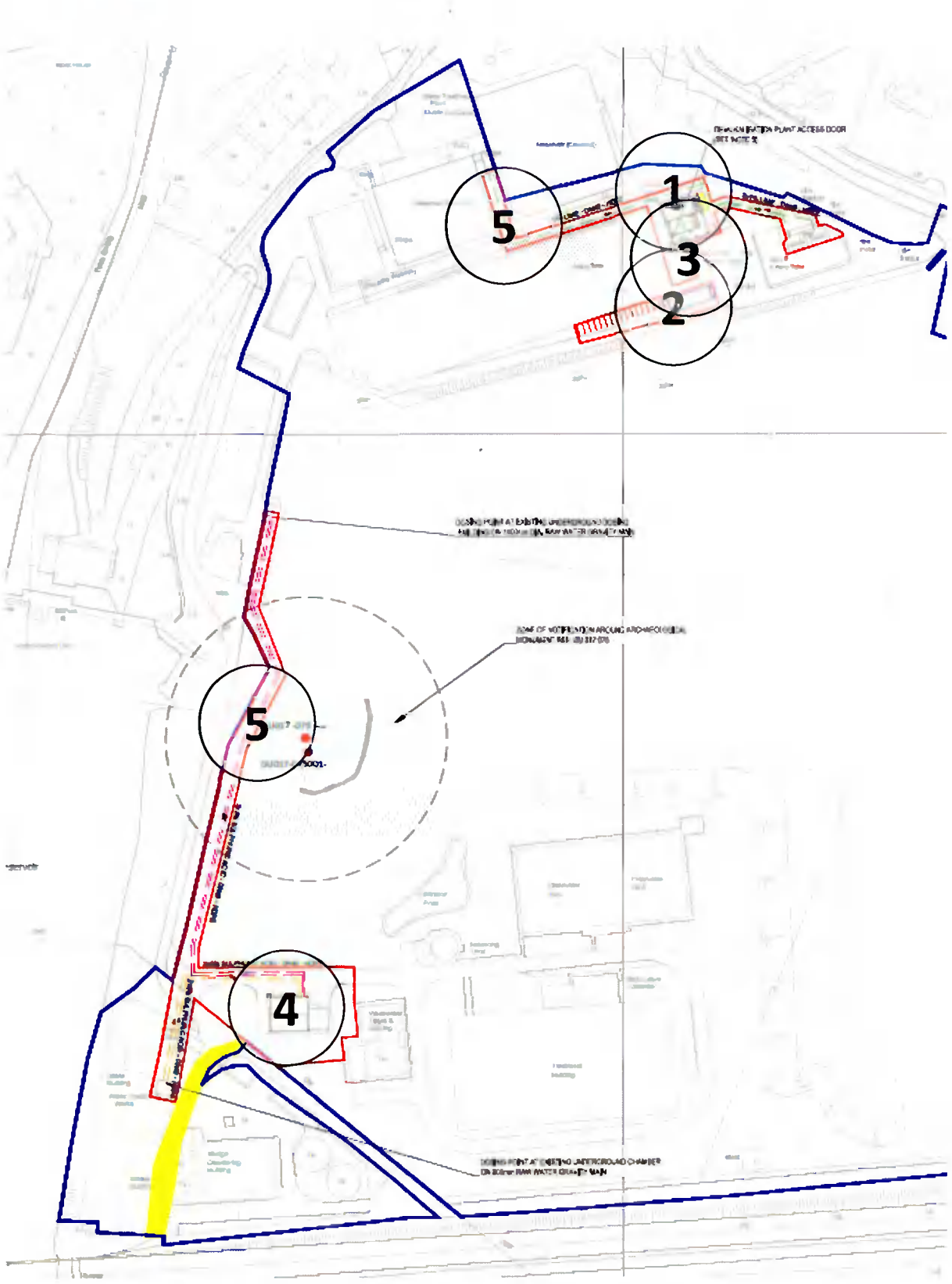

Figure 10: Site Layout Illustrating Elements of the Proposed Development - Planning Drawing No. 11118-RHL-LP2-XX-DR-PL-0003

3.11 Environmental Considerations

The proposed development has been reviewed and screened in terms of the Appropriate Assessment and Environmental Impact Assessment processes, with supporting documentation enclosed with this application.

The Appropriate Assessment Screening report concludes that: *"... in accordance with Article 6(3) of the Habitats Directive, the works in Leixlip WTP, Co. Dublin will have no significant effects and Stage 2 of the Appropriate Assessment process (Natura Impact Statement) is not required."*

The Environmental Impact Assessment Screening Report concludes that: *"Having regard for the proposed works and in the context of previous studies undertaken, this report concludes that this proposal is not one which is likely to have significant effects on the environment, either by itself or in combination with other plans or projects, and that an Environmental Impact Assessment Report (EIAR) is not required under the Planning and Development Act 2000, as amended and incorporating the Planning and Development Regulations 2001, as amended. The proposed Leixlip WTP upgrade does not comprise a class of project specified in either Part 1 or Part 2 of Schedule 5 to the Planning and Development Regulations 2001, as amended, and therefore neither a mandatory nor subthreshold EIA is required. It is concluded that there is no requirement for the Planning Authority to conduct an EIA in respect of the project which comprises Leixlip WTP upgrade and there is no requirement on South Dublin County Council or the Applicant to either prepare or submit an EIA Report in relation to this project."*

We trust that the Planning Authority will concur with the above assessments that no specific environmental concerns arise or further assessments are required.

3.12 Flood Risk

The Applicant has also commissioned a Site-Specific Flood Risk Assessment (FRA) in relation to the proposed development. The assessment concludes that: *"The site is located in Flood Zone C – at low risk of fluvial flooding and is above the potential fluvial flood level of the River Liffey to the north of the site. Although the pluvial flooding risk is relatively low, proper measures are set out for the surface water management during the life and the construction stage. For the reasons stated above, the proposed site is in line with the core objectives of the Flood Risk Management Planning Guidelines (OPW, 2009) and therefore the proposed site would comply with the national, regional and local planning policy and would not have a significant negative impact on the environment due to low flooding risk assessed by different sources."*

3.13 Archaeological Heritage

The Applicant has also commissioned an Archaeological & Built Heritage Assessment in relation to the proposed development, enclosed herein. The report notes at the outset that *"The existing WTP infrastructure is located in a recorded area of high archaeological sensitivity as attested by the archaeological features and material encountered over several previous investigations."*

In relation to Archaeology, the report notes that the proposed development can be assessed in three parts, the works around the Old WTP (e.g. the Lime Dosing & Storage Building, new workshop, etc.), the works around the New WTP (e.g. the Acid Dosing building), and the connecting dosing line infrastructure.

In relation to works around the old and new WTP complexes, proposed construction in this area is *"considered to have an **Imperceptible Impact** on the archaeological resource"* [report emphasis].

In relation to the proposed connecting dosing line infrastructure which traverses the site, along the western extent, this has been identified as having potential to impact on archaeological features,

including a recorded site.
The assessment proposes mitigation to be provided, primarily relating to monitoring of any ground disturbance to be agreed and specified by the National Monuments Service. This is a relatively typical level of mitigation which could be affirmed via a condition of planning permission, with the precise detail of same being a matter for agreement with the National Monuments Service.

3.14 Architectural Heritage

The enclosed Archaeological & Built Heritage Assessment also refers to local Architectural Heritage issues arising in relation to the proposed development, and notes 8 no. (6 no. protected) structures in the general vicinity of the overall site, including the (non-protected) Leixlip Hydro-electric dam.

In relation to Built Heritage, as with Archaeology, the report notes that the proposed development can be assessed in three parts, the works around the Old WTP (e.g. the Lime Dosing & Storage Building, new workshop, etc.), the works around the New WTP (e.g. the Acid Dosing building), and the connecting dosing line infrastructure.

In relation to the Old Treatment Plant area, and the adjacent Salmon Leap Inn protected structure in particular, we paraphrase the conclusions of the report notes as follows:

- The proposed development would have no physical impacts on the Protected Structure.
- The proposed building and associated silos would exceed the height of the roofline of this Protected Structure and would thus detract from the view of the building from the northern & eastern approaches. However, an existing building (pump-hall) – located within the WTP site already exceeds this roofline height and the proposed silos.
- The proposed building and associated silos would be located to the rear of the Protected Structure and thus would not obstruct views of the building.
- While views of this Protected Structure may be altered, the proposed development is located within the site of existing long-standing industrial/service infrastructure of a strategic nature.

It is our opinion that these impacts must be weighed up and balanced against the strategic importance of the proposed upgrade, which will ensure the provision and supply of public drinking water in compliance with the Drinking Water Regulations produced at a regionally important long standing water treatment plant, and reduce the risk of boil water notices in the future.

In relation to works at the New Treatment Plant Area (i.e. the Acid Dosing & Storage Building), we note the report concludes that: *"The elevation of the proposed structure is low (8.65m) relative to the adjacent buildings and will be screened from the Protected Structure by the existing WTP and local topography. The proposed development at this location would be thus considered to have an Imperceptible Impact on the built heritage resource of the area."*

We therefore submit that the Planning Authority can be satisfied, including having regard to the Landscape and Visual Impact Assessment and enclosed drawings and illustrations, that the proposed development would not have an inappropriate or disproportionate effect on the architectural / built heritage of the area, when balanced with the strategic importance of the proposed development and the lack of alternative development locations or formats.

3.15 Waste Management, Lighting, Odour & Noise Considerations

The waste management proposals have been presented in the Construction Waste Management Plan appended to the Construction and Environmental Management Plan. There are no proposals to add to or remove existing public lighting.

Odour and Noise emissions will not materially alter from the existing pattern at the existing Water Treatment Plant complex.

3.16 Hazardous Materials / Chemicals

The Applicant confirms that there will not be any hazardous materials involved in the proposed development or the operation of the proposed processes. Other than the chemicals proposed as part of the works (sulphuric acid and lime), there will not be storage of chemicals on site during the construction or operational phases of development.

3.17 Construction Management

A Construction and Environmental Management Plan has been completed on behalf of the Client, outlining the proposed construction methodologies.

4 APPLICATION DOCUMENTATION

4.1 Planning Application Fee

Payment for the sum of €2,791.60 is supplied in accordance with Schedule 9 of the Planning & Development Regulations, 2001-2021. This is calculated as follows:

Fee Class (as per Schedule 9)	Rate	Quantum	Amount
4 - Buildings	€3.60	656 sqm	€2,361.60
8 – Tanks & Plant / Equipment	€50.00 per 0.1 hectare	7	€350.00
13 - Miscellaneous / Demolition	€10.00 per 0.1 hectare	7	€80.00
Total			€2,791.60

4.2 Statutory Notices & Application Form

A completed South Dublin County Council Planning Application Form, signed and dated Friday, 1st October 2021, has been included.

A copy of the page of The Herald, dated Friday, 1st October 2021, in which the Notice has been published pursuant to Article 17(1)(a) of the *Planning & Development Regulations, 2001-2021.*

A copy of the Site Notice, which has been erected on site pursuant to article 17(1) (b) of the *Planning & Development Regulations, 2001-2021* on Friday, 1st October 2021.

4.3 Supporting Assessments / Reports

The following reports are included in the Planning Application:

- Landscape & Visual Impact Assessment
- Photomontages
- Architectural Design Statement
- Appropriate Assessment Screening
- Environmental Impact Assessment Screening

- Flood Risk Assessment
- Invasive Species Survey Summary Report
- Preliminary Archaeological & Built Heritage Assessment
- Construction and Environmental Management Plan

5 CONCLUSION

The proposed development is required to ensure treated drinking water supplied to approximately 600,000 customers meets the requirements of the Treated Drinking Water Regulations and addresses a direction from the EPA. Irish Water is obliged to provide an enhanced coagulation and pH control in the water treatment process at Leixlip Water Treatment Plant.

The proposed development is the preferred solution, arising from an assessment of options, and takes into account the project need, site constraints and the requirement to tie-in with existing infrastructure.

We acknowledge the potential localised visual impact, of the proposed silos in particular, but we are of the opinion that the proposed mitigation measure, comprising architecturally designed screens, will limit the impact as described above and in the LVIA.

In our opinion, the limited adverse effects are acceptable to ensure public health issues are addressed so that water supplied from this regionally important WTP to 600,000 customers, is compliant with the Drinking Water Regulations and the direction of the EPA.