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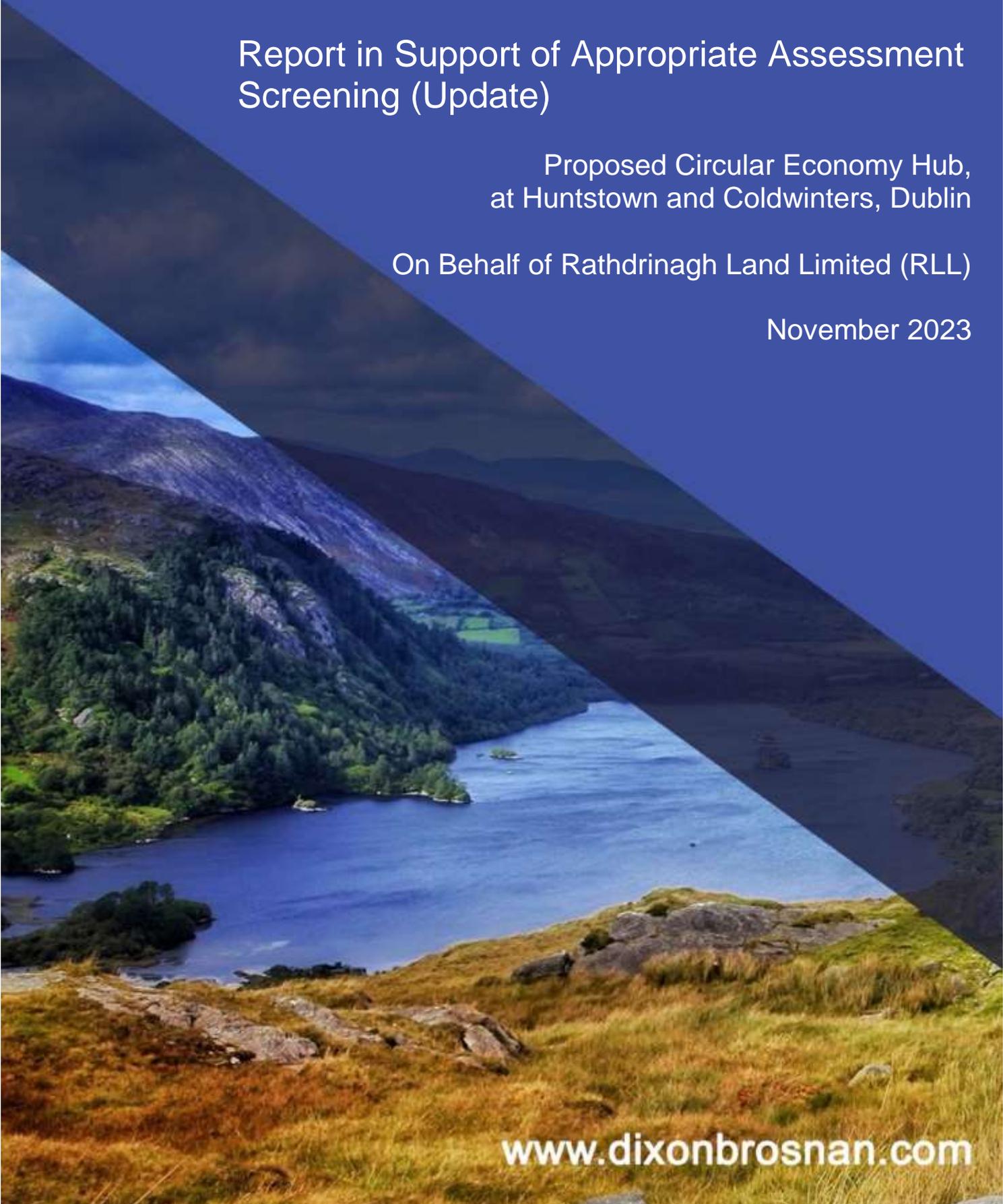
Report in Support of Appropriate Assessment Screening (Update)

Proposed Circular Economy Hub,
at Huntstown and Coldwinters, Dublin

On Behalf of Rathdrinagh Land Limited (RLL)

November 2023

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Project	Report in Support of Appropriate Assessment Screening for Proposed Circular Economy Hub at Coldwinters and Huntstown, Co. Dublin	
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1. Introduction

1.1 Background

The information in this report has been compiled by DixonBrosnan Environmental Consultants, on behalf of the applicant. It provides information on and assesses the potential for the proposed circular economy hub at Coldwinters and Huntstown, Co. Dublin to impact on any European sites within its likely zone of impact.

Following submission of the planning application, the applicant subsequently received the following request for further information from the planning authority.

Having regard to case law of the Irish High Court and the CJEU (e.g. Case C-258/11, Sweetman and others) which established that determinations cannot have lacunae and must contain complete, precise and definitive findings capable of removing all reasonable scientific doubt as to the effects of a project on a European site, the planning authority is not satisfied that the proposal would not result in significant effects on European sites. Therefore, clarification is required in the form of an updated AA Screening report (and if necessary a Natura Impact Statement). A full appraisal of the surface and foul water management regime proposed, during construction and operation, is required, including a detailed analysis of the volumes and quality of water arising during operation, particularly its treatment and storage prior to discharge to the foul sewer or to the ground. This detailed clarification is required to enable an assessment to be made of whether the development, in view of best scientific knowledge, individually or in combination with another plan or project is likely to have a significant effect on a European site.

The response should have full regard to the additional information being requested, particularly in relation to flooding and foul and surface water management in general.

This updated report addresses the issues raised in this correspondence.

The Birds Directive (2009/147/EC) and the Habitats Directive (92/42/EEC) put an obligation on EU Member States to establish the Natura 2000 network of sites of highest biodiversity importance for rare and threatened habitats and species across the EU. In Ireland, the Natura 2000 network of European sites comprises Special Areas of Conservation (SACs, including candidate SACs) and Special Protection Areas (SPAs, including proposed SPAs). SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is selected correspond to the qualifying interests of the sites and from these the conservation objectives of the site are derived. The Birds and Habitats Directives set out various procedures and obligations in relation to nature conservation management in Member States in general, and of the European sites and their habitats and species in particular. A key protection mechanism is the requirement to consider the possible nature conservation implications of any plan or project on the Natura 2000 site network before any decision is made to allow that plan or project to proceed. Not only is every new plan or project captured by this requirement but each plan or project, when being considered for approval at any stage, must take into consideration the possible effects it may have in combination with other plans and projects when going through the process known as Appropriate Assessment (AA).

The obligation to undertake Appropriate Assessment (AA) derives from Article 6(3) and 6(4) of the Habitats Directive, and both involve a number of steps and tests that need to be applied in sequential order. Article 6(3) is concerned with the strict protection of sites, while Article 6(4) is the procedure for allowing derogation from this strict protection in certain restricted circumstances. As set out in Section 177U of the Planning and Development Act 2000 as amended, a screening for appropriate assessment of an application for consent for the proposed development must be carried out by the competent authority to assess, in view of best scientific knowledge, if the proposed development, individually or in combination with another plan or project is likely to have a significant effect on any European site. Each step in the assessment process precedes and provides a basis for other steps. The results at each step must be documented and recorded carefully so there is full traceability and transparency of the decisions made.

1.2 Aim of Report

The purpose of this report is to inform the AA process as required under the Habitats Directive (92/43/EEC) in instances where a plan or project may give rise to significant impacts on a European site. This report aims to inform the Appropriate Assessment process in determining whether the development, both alone and in combination with other plans or projects, are likely to have a significant impact on the European sites in the study area, in the context of their conservation objectives and specifically on the habitats and species for which the sites have been designated.

This report has been prepared with regard to the following guidance documents, where relevant.

- *Managing Natura 2000 Sites: The Provision of Article 6 of the Habitats Directive 92/43/EEC (European Commission (EC), 2018);*
- *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodical Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission (EC), 2021);*
- *Guidance Document on Article 6(4) of the Habitats Directive 92/43/EEC (European Commission, (EC) 2007);*
- *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (Department of Environment, Heritage and Local Government, 2010 revision);*
- *Appropriate Assessment under Article 6 of the Habitats Directive; Guidance for Planning Authorities. Circular NPW 1/10 and PSSP 2/10 (Department of Environment, Heritage and Local Government, 2010);*
- *Guidelines for Good Practice Appropriate Assessment of Plans under Article 6(3) Habitats Directive (International Workshop on Assessment of Plans under the Habitats Directive, 2011);*
- *Commission notice Guidance document on wind energy developments and EU nature legislation, (EC 2020);*
- *Communication from the Commission on the precautionary principle. European Commission (2000)*

- *Assessment of plans & projects in relation to N2K sites – Methodological Guidance (EC 2021) and*
- *Guidance document on the strict protection of animal species of Community interest under the Habitats Directive (EC 2021).*

1.3 Authors of Report

This report and survey work was completed by Carl Dixon MSc (Ecological Monitoring) and Dr. Sorcha Sheehy PhD (Ecology/ornithology).

Carl Dixon holds an Honours Degree (BSc) in Ecology and a Masters (MSc) in Ecological Monitoring from UCC. He is a senior ecologist who has over 25 years' experience in ecological assessment. Prior to setting up DixonBrosnan Environmental Consultants in 2000, Carl set up and ran Core Environmental Services which included REPS planning for landowners and ecological assessments. Carl has particular experience in freshwater ecology, including electrofishing fish stock assessments and water quality assessments. He also has considerable experience in habitat mapping and mammal ecology including survey work and reporting in relation to Badgers and bats. Other competencies include surveys for invasive species and bird surveys. Carl has extensive experience with regards to EIAR and NIS mitigation and impact assessment. He has experience in large-scale industrial developments with extensive experience in complex assessments as part of multi-disciplinary teams. Such projects include gas pipelines, incinerators, electrical cable routes, oil refineries and quarries.

Sorcha Sheehy PhD (Ecology/ornithology) is an ecologist and ornithologist who has worked for 15 years in environmental consultancy. She has worked on Screening/NISs for a range of small and large-scale projects with expertise in assessing impacts on birds. Sorcha's PhD research focused on bird behaviour at airports, where she studied bird avoidance behaviour and collision risk to aircraft. Her research involved field observations, post-mortem analysis and radar surveys. Sorcha has worked on bird collision risk assessments at airports throughout Ireland including Dublin airport, Cork airport, Shannon airport and Kerry airport. During her consultancy work Sorcha carried out field-based surveys and environmental reports including NIS, AA screening and EIARs. Notable projects include the Arklow Bank Wind Park, Indaver Ireland Waste Management Facility at Ringaskiddy, Irving Oil Whitegate Refinery (IOWR), Shannon LNG and Greenlink Interconnector.

2. Regulatory Context and Appropriate Assessment Procedure

2.1 Regulatory Context

The Habitats Directive (Council Directive 92/43/EEC on the *Conservation of Natural Habitats and of Wild Fauna and Flora*) aims to maintain or restore the favourable conservation status of habitats and species of community interest across Europe. The requirements of these directives are transposed into Irish law through the European Communities (Birds and Natural Habitats Regulations 2012-2021).

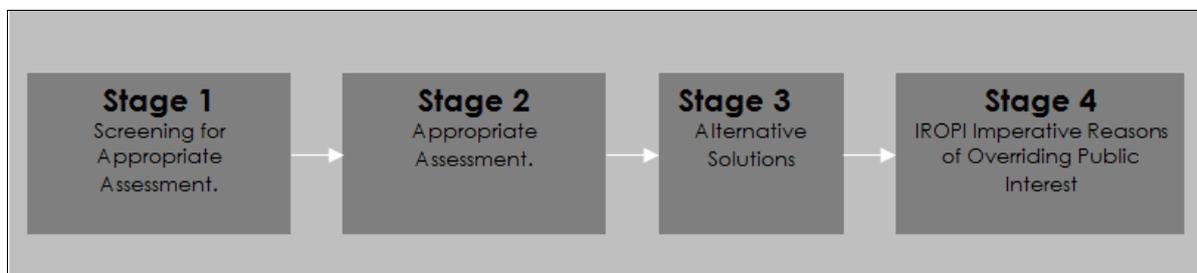
Under the Directive a network of sites of nature conservation importance have been identified by each Member State as containing specified habitats or species requiring to be maintained or returned to favourable conservation status. In Ireland the network consists of SACs and SPAs, and also candidate sites, which form the European network.

Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the *Conservation of Natural Habitats and of Wild Fauna and Flora* (as amended) (hereafter ‘the Habitats Directive’) requires that, any plan or project not directly connected with or necessary to the management of a designated site, but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. A competent authority (e.g. the EPA or Local Authority) can only agree to a plan or project after having determined that it will not adversely affect the integrity of the site concerned.

The possibility of a significant effect on a designated or “European” site has generated the need for an appropriate assessment to be carried out by the competent authority for the purposes of Article 6(3). A Stage Two Appropriate Assessment is required if it cannot be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site. The first (Screening) Stage for appropriate assessment operates merely to determine whether a (Stage Two) Appropriate Assessment must be undertaken on the implications of the plan or project for the conservation objectives of relevant European sites.

2.2 Appropriate Assessment Procedure

The assessment requirements of Article 6(3) establish a stage-by-stage approach. This assessment follows the stages outlined in the 2001 European Commission publications “Assessment of plans and projects significantly affecting Natura 2000 sites: methodological guidance on the provisions of Articles 6(3) and 6(4) of the Habitats Directive 92/43/EEC” (2001) and *Managing Natura 2000 Sites: the provisions of Article 6 of the ‘Habitats’ Directive 92/43/EEC* (Draft) Office for Official Publications of the European Communities, Luxembourg (EC, 2015);



The stages are as follows:

Stage One: Screening — the process which identifies any appreciable impacts upon a European site of a project or plan, either alone or in combination with other projects or plans, and considers whether these impacts are likely to be significant;

Stage Two: Appropriate assessment — the consideration of the impact on the integrity of the European site of the project or plan, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts;

Stage Three: Assessment of alternative solutions: The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the European site. It is confirmed that no reliance is placed by the developer on Stage Three in the context of this application for development consent;

Stage Four: Assessment where no alternative solutions exist and where adverse impacts remain — an assessment of compensatory measures where, in the light of an assessment of imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan should proceed (it is important to note that this guidance does not deal with the assessment of imperative reasons of overriding public interest). Again, for the avoidance of doubt, it is confirmed that no reliance is placed by the developer on Stage Four in the context of this application for development consent.

It is the responsibility of the competent authority, in this instance Fingal County Council, to make a decision on whether or not the proposed development should be approved, taking into consideration any potential impact upon any European site within its likely zone of impact.

3. Receiving Environment

3.1 Existing site

The proposed development site is located in the Cement Roadstone Holdings (CRH) Huntstown Quarry complex. The site is located approximately 8km northwest of Dublin city centre, 1km northwest of Finglas. (Figure 1). The M50/N2 junction is located approximately 500m northwest and the surrounding land use is a mix of quarrying, utilities and agricultural land. The Roadstone Huntstown Quarry site is located to the southwest, the Huntstown Power Station, a Tier 2 Seveso Site to the northwest and an Eirgrid 220kv transmission station to the southeast. The adjoining lands to the east, south and west are currently used for agriculture. The nearest private residences are on the R135, approximately 200m from the eastern development site boundary. The site is accessed via National Road N2, Regional Road R135 and an internal CRH roadway.

While the current land use at the site is agricultural, the site is zoned for heavy industry in the Fingal Development Plan, 2017-2023.

The proposed development site covers an area of 2.98ha and encompasses one field and a portion of second one, both of which are currently used for farm animal grazing and tillage (**Figure 2**). Two 38kv and one 110kv overhead powerlines running from south-east to north-west across the north- eastern part of the site, and a 10kv line running from south-west to north-east through the centre of the site have been undergrounded.



Figure 1. Site location (red square) | Source O'Callaghan Moran

3.2 Proposed Development

The proposed development is Phase 1 of the proposed 9.655 ha Huntstown Circular Economy Hub (Hub). It comprises a Materials Recovery Facility (MRF), a Food Container Cleaning Plant and ancillaries.

A MRF is the first step in the recovery and recycling chain and its purpose is to sort a wide range of wastes into recoverable and recyclable streams, with the objective of achieving a 98% recovery rate. The recoverable materials will be sent off-site to authorised recovery facilities, for example waste to energy plants, cement kilns and soil recovery sites.

Initially the majority of the potential recyclables (metals, paper, plastic, cardboard, wood) will also be sent off site for further treatment to produce recyclates that can be reintroduced into the economy. The EPA recently issued a draft protocol for the production of recycled aggregates from construction and demolition waste that will meet End of Waste Status, meaning they can be used as an alternative to quarry won materials. It is the intention to manufacture these aggregates in Phase 1. Subsequent Phases of the Hub will include recycling facilities that will process other recyclables, for example plastics and wood into products that can be reintroduced into the economic cycle and replace virgin materials.

In response to growing sustainability pressures, in particular the need to minimise 'single use plastics', the food retail industry is moving towards the use of reusable food containers and tertiary packaging. The proposed Food Container Cleaning Plant will provide a centralised washing/sterilisation facility for large food retailers in the Greater Dublin Area to facilitate the multiple re-use of these items.

The proposed Food Container Cleaning Plant will provide a centralised washing/sterilisation facility for large food retailers in the Greater Dublin Area to facilitate the multiple re-use of these items. The washing plant will include a pre-wash to remove visible dirt and debris, a main wash with detergents followed by a rinse. The water will be sourced from the mains supply

augmented by rainwater harvesting. The process water will be treated in an on-site wastewater treatment plant with the treated water recycled to the washing plant. To maintain quality there will be a continuous bleed to the foul sewer.

The layout of the proposed Hub is shown on Drawing No P002 and the proposed layout of Phase 1 is shown on Drawing No. P001. As per the project description the proposal consists of:

1. The development will consist of the erection 2no. separate buildings and associated site area for use as a Circular Economy Hub.
2. The processes to be carried out within the Materials Recovery Facility building include for the sorting of range of wastes into recoverable and recyclable streams. Recoverable wastes to be processed will include for potential recyclables. This building will include for an external odour control plant with associated flue.
3. The processes to be carried out in the Food Container Cleaning Plant building will provide a centralised washing/sterilisation facility for large food retailers in the area to facilitate re-use of containers.
4. The 2no. buildings to be constructed will incorporate ancillary office and staff facilities along with solar PV panels and signage.
5. The development of associated access roads, turning/loading areas, footways, parking areas, electric vehicle charge points, landscaping, lighting, fencing, bicycle and bin storage facilities and associated site works.
6. The provision of an ESB substation.
7. The provision of ancillary external storage areas.
8. The reprofiling of existing ground levels within the site and associated works to include for infilling and reprofiling of lands within the overall site area.
9. The provision of a new site entrance with associated works to facilitate vehicular and pedestrian access along with associated upgrade works to the adjacent public road to include for provision of footpaths and cycle paths.
10. The provision of a weighbridge and associated staff building at the entrance.
11. The provision of perimeter fencing and security gates.
12. The provision of all associated hard and soft landscaping works.
13. Provision of attenuation tanks and associated infrastructure as part of the surface water system along with installation of a bypass petrol interceptor.
14. All ancillary site development, landscaping and construction works to facilitate foul, water and service networks.

Phase 1 involves an extensive 'cut and fill' across Phase 1 to achieve formation levels and will result in the loss of ca 220m of the existing hedgerow along the boundary of the two fields and the small scrub area on the hill. Pending the development of future Phases, the lands outside of Phase 1 will be returned to agricultural use. Work is currently ongoing to underground the

overhead power lines that currently traverse the site. Further detail on the proposed site layout is included in **Appendix 2** of this report.



Figure 2. Overview of proposed development | Source O'Callaghan Moran

3.3 Regulatory Approval

The overall annual materials intake in Phase 1 will be 95,000 tonnes. As the materials that will be accepted and processed in the MRF are wastes and as the annual waste intake will exceed 50,000 tonnes an Industrial Emissions Licence issued by the EPA is required to allow the facility to operate. The EPA Licence will specify the operational and infrastructural controls that must be implemented and the emission limit values that must be achieved to ensure that operations do not give rise to either environmental pollution, or impairment of amenity outside the facility boundary.

The EPA Licence will also identify the monitoring that the operator must carry out to demonstrate compliance with the Licence requirements. In addition, the EPA will conduct regulatory compliance.

3.4 Surface Water Drainage

The surface storm water design consists of the following components.

- SuD's infiltration soakaway with storage capacity.
- Permeable paving to carpark areas
- Rainwater harvesting to building roofs

It is proposed to harvest the rainwater from the building roofs allowing for attenuation of up to 10,000 litres per industrial unit for further use. As such 2no separate surface water drainage systems have been proposed to separate rainwater from the roof and to collect it in the

rainwater harvesting tank. A separate surface water system for trafficked hardstand areas and all ground surface rainwater runoff has been proposed and to be discharged through a by-pass petrol interceptor (Klargester). All rainwater from the site will be stored and infiltrated at site, there is therefore no outfall from the site and as such the controlled flow rate is 0.0 litres per second per hectare (0l/s/ha).

A BRE 365 infiltration test was carried out as part of the site investigation to the site, details of the infiltration rate can be found in the Engineering Services Report in **Appendix 3**.

In order to comply with Fingal County Council Development Plan requirements, it is necessary to include a SuDS based storm water management system in accordance with the Greater Dublin Strategic Drainage Strategy. The above listed SuDS design items are included through the following;

- Permeable paving to all car parking areas to allow for self-infiltration to the subsoil. Given the turning of heavy duty HGV's it is not possible to provide permeable paving to all hardstand areas.
- Rainwater harvesting is provided to all roof water in the form of underground rain harvesting butts. The retained water will be used for general washing and vehicle washing.
- The installation of an underground storage cell with subsoil infiltration (soakaway). The drainage from the hardstand yard areas will be directed to a petrol/oil interceptor and in turn to the storage cell to allow for infiltration to the subsoil.
- The surface water drainage system has been designed to ensure adequate capacity is achieved with a minimum self-cleansing velocity in the pipes when flowing half full.
- It is noted the previous planning application ref FW20A/0063 made reference to an open swale. Open swales or retention ponds are not a viable means of SuDS for this site. Open swales and ponds attract bird life and the proximity of the site to Dublin Airport would increase the risk to aircraft from increased bird number. This above is addressed further in the Aviation Consultants report accompanying the application.

All surface water drainage shall be constructed in accordance with Greater Dublin Region Code of Practice for Drainage Works

Surface water drainage layouts are shown in **Appendix 2**.

3.5 Foul Drainage

The nearest available connection to the public foul sewer is located to the North Rd, to the east of the site, it is noted that the foul sewage connection point sits outside the site boundaries.

The existing site is not serviced by foul sewage infrastructure.

The foul sewer branch pipes conveying the effluent from the development to the main foul drainage system will generally consist of 300mm dia pipes. Given the available gradient to the outfall point a 300mm diameter pipe is required to achieve an adequate self-cleansing velocity.

The proposed Irish Water Greater Dublin Orbital Sewer route passes through the site. A consultation meeting was held with Irish Water on the 13th December 2022 where agreement for the proposed warehouse development was provided in principle.

Daily sanitary foul discharge has been estimated based on the proposed development use in accordance with the EPA and Irish Water guidelines.

Max Design Flow:

= 1500 litres per day.

Assuming 6 times dry weather flow (DWF), the peak hydraulic discharge arising from this development is: 0.42 l/second.

The pipe network has been designed to ensure that sufficient hydraulic capacity and cleansing velocities are achieved, in accordance with Irish Water Code of Practice.

Max Organic Load:

=2.5kg (BOD5)/day.

Population Equivalent Value:

= 60 P.E.

Bales of SRF/RDF will be stored externally as a contingency in the event that the cement kilns/waste to energy plants are off-line for longer than normal during the planned annual maintenance shut-down, or if there is a major outage. As these are contingency events it is not possible to predict the frequency of occurrence.

The quantity of run-off-diverted to the foul sewer that will connect to the Ringsend Wastewater Treatment Plant (WWTP) is a function of the duration of the external storage, the size of the storage area and the amount of rainfall during the temporary storage period.

Assuming, worst case that the bales are stored externally for two weeks, the storage area is 1,000m², and an average weekly rainfall of 75mm, the total volume of run-off diverted to the foul sewer would be 150m³, equivalent to a daily average of 10.7m³.

The wrapping on the bales is intended to prevent liquid seeps from the materials during storage and transport and it also prevents the infiltration of rainfall into the bales. Therefore the risk of surface water contamination is low.

As a worst case it has been assumed that in the run-off from the temporary storage area the Biochemical Oxygen Demand (BOD) will be 80 mg/l, the Chemical Oxygen Demand (COD) will be 200mg/l and the Total Suspended Solids (TSS) will be 100mg/l. These are all significantly below the average levels in the influent to the Ringsend WWTP, which are BOD 259mg/l, COD 533mg/l and TSS 240mg/l.

All foul drainage will be constructed in accordance with Greater Dublin Region Code of Practice for Drainage Works and Irish Water requirements.

Further details on foul drainage layouts are included in **Appendix 2**.

4. Screening

4.1 Introduction

This section contains the information required for the competent authority to undertake screening for AA for the proposed development.

The aims of this section are to:

- Determine whether the proposed development is directly connected with, or necessary to, the conservation management of any European sites;
- Provide information on, and assess the potential for the proposed development to significantly effect on European Sites (also known as European sites); and
- Determine whether the proposed development, alone or in combination with other projects, is likely to have significant effects on European sites in view of their conservation objectives.

The proposed development is not directly connected with, or necessary to the conservation management of any European sites.

4.2 Study Area and Scope of Appraisal

Natura 2000 sites (European sites) are only at risk from significant effects where a source-pathway-receptor link exists between a proposed development and a European site(s). This can take the form of a direct impact (e.g. where the proposed development and/or associated construction works are located within the boundary of the European site(s) or an indirect impact where impacts outside of the European site(s) affect ecological receptors within (e.g. impacts to water quality which can affect riparian habitats at a distance from the impact source).

The Likely zone of impact (Zol) comprises the area within which the proposed development may potentially affect the conservation objectives (or qualifying interests) of a European site. There is no recommended likely zone of impact, and guidance from the National Parks and Wildlife Service (NPWS) recommends that the distance should be evaluated on a case-by-case basis with reference to the nature, size and location of the project, the sensitivities of the ecological receptors, and the potential for in-combination effects (cumulative).

In ecological and environmental impact assessment, for an effect to occur there must be a risk enabled by having a source (e.g. construction works at a proposed development site), a 'receptor' (e.g. SAC or other ecologically sensitive feature), and a pathway between the source and the receptor (e.g. a watercourse which connects the proposed development site to the SAC, *ex situ* foraging habitat for SCI birds). A 'receptor' is defined as the Special Conservation Interest (SCI) of SPAs or Qualifying Interest (QI) of SACs for which conservation objectives have been set for the European sites being screened.

Consideration is therefore given to the source-pathway-receptor linkage and associated risks between the proposed development and European sites. For a significant effect to occur there needs to be an identified risk whereby a source (e.g., contaminant or pollutant arising from

construction activities) affects a particular receptor (i.e. European site) through a particular pathway (e.g. a watercourse which connects the proposed development with the European site).

The identification of risk does not automatically mean that an effect will occur, nor that it will be significant. The identification of these risks means that there is a possibility of environmental or ecological damage occurring. The level and significance of the effect depends upon the nature of the consequence, likelihood of the risk and characteristics of the receptor.

The precautionary principle is applied for the purposes of screening to ensure that consideration and pre-emptive action is undertaken where there is a lack of scientific evidence. It is noted that mitigation measures are not taken into account in the AA screening assessment process.

4.3 Field Study

Site surveys were carried out on the 4th of December and 1st March 2021 and the 27th of August 2022 to identify the habitats, flora and fauna present at the site. The surveys assessed the potential for all Qualifying Interests (QIs)/ Special Conservation Interests (SCIs) of European sites and third schedule invasive species to occur within the proposed site.

4.4 Source-Pathway-Receptor Model

The likely effects of the proposed development on any European site has been assessed using a source-pathway-receptor model, where:

- A 'source' is defined as the individual element of the proposed works that has the potential to impact on a European site, its qualifying features and its conservation objectives.
- A 'pathway' is defined as the means or route by which a source can affect the ecological receptor.
- A 'receptor' is defined as the SCI of SPAs or QI of SACs for which conservation objectives have been set for the European sites being screened.

A source-pathway-receptor model is a standard tool used in environmental assessment. In order for an effect to be likely, all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism results in no likelihood for the effect to occur. The source-pathway-receptor model was used to identify a list of European sites, and their QIs/SCIs, with potential links to European sites. These are termed as 'relevant' European sites/QIs/SCIs throughout this report.

4.5 Likely Significant Effect

The threshold for a Likely Significant Effect (LSE) is treated in the screening exercise as being above a de minimise level. The opinion of the Advocate General in CJEU case C-258/11 outlines:

“the requirement that the effect in question be ‘significant’ exists in order to lay down a de minimise threshold. Plans or projects that have no appreciable effect on a European site are thereby excluded.

If all plans or projects capable of having any effect whatsoever on the site were to be caught by Article 6(3), activities on or near the site would risk being impossible by reason of legislative overkill.”

In this report, therefore, ‘relevant’ European sites are those within the potential Zol of activities associated with the construction and operation of the proposed development, where LSE pathways to European sites were identified through the source-pathway-receptor model.

4.6 Screening Process

The Screening for Appropriate Assessment will incorporate the following steps:

Definition of the likely zone of impact for the proposed works;

- Identification of the European sites that are situated (in their entirety or partially or downstream) within the likely zone of impact of the proposed works;
- Identification of the most up-to-date QIs and SCIs for each European site within the likely zone of impact;
- Identification of the environmental conditions that maintain the QIs/SCIs at the desired target of Favourable Conservation Status;
- Identification of the threats/impacts – actual or potential that could negatively impact the environmental conditions of the QIs/SCIs within the European sites;
- Highlighting the activities of the proposed works that could give rise to significant negative impacts; and
- Identification of other plans or projects, for which in-combination impacts would likely have significant effects.

4.7 Desktop Review

A desktop review facilitates the identification of the baseline ecological conditions and key ecological issues relating to European sites and facilitates an evaluation assessment of potential in-combination impacts. Sources of information used for this report include reports prepared for the Coldwinters and Huntstown areas and information from statutory and non-statutory bodies. The following sources of information and relevant documentation were utilised:

- National Parks & Wildlife Service (NPWS) - www.npws.ie
- Environmental Protection Agency (EPA) – www.epa.ie
- National Biodiversity Data Centre (NBDC) – www.biodiversityireland.ie
- Invasive Species Ireland - <http://www.invasivespeciesireland.com/>
- *Best Practice Guidance for Habitat Survey and Mapping* (Heritage Council, 2011)
- *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (National Roads Authority, 2009).
- *Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU)* European Union, 2017 and

- Fingal Development Plan 2017-2023 and
- Draft Fingal Biodiversity Action Plan 2022-2030.

5. European Sites

5.1 Designated sites within Likely zone of impact

Special Areas of Conservation (SACs) and candidate SACs are protected under the Habitats Directive 92/43/EEC and the European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Special Protection Areas (SPAs) are protected under the Birds Directive 2009/147/EC and European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Collectively, these sites are referred to as Natura 2000 or European sites.

In accordance with the European Commission Methodological Guidance (EC 2018), a list of Natura 2000 Sites that can be potentially affected by the proposed project has been compiled. All candidate SACs (cSAC) and SPAs sites which could potentially be impacted by the proposed development have been identified. **Table 1** lists the relevant Natura 2000 sites, the location of which are shown in **Figure 3**.

The proposed development site is not located within or adjacent to any Natura 2000 site. While there are no watercourses within the proposed development site, there are a number of small streams surrounding the area i.e., Huntstown Stream 970m north, Abbottstown Stream 1.5km west and Batchelor's Stream 1.6km southeast. The topography of the site falls from east to west and there is not hydrological pathway to the Huntstown Stream to the north. Although unlikely, given the absence of a direct hydrological connection, uncontrolled surface water runoff from the site could potentially reach Abbottstown Stream 1.5km west and Batchelor's Stream 1.6km southeast. The Bachelor's Stream and Abbottstown Stream are tributaries of the River Tolka which flows into the South Dublin Bay and Tolka River Estuary SPA approximately 7.8km downstream of the proposed development site. The South Dublin Bay and Tolka River Estuary SPA is located adjacent to the North Dublin Bay SAC, South Dublin Bay SAC and North Bull Island SPA. Although unlikely surface water run-off during the construction or operational phase of the proposed development could potentially flow into South Dublin Bay and Tolka River Estuary SPA, North Dublin Bay SAC and the North Bull Island SPA. Therefore, although improbable, the proposed development could potentially impact on qualifying aquatic habitat and species within these Natura 2000 sites. Construction works could also potentially spread invasive species to these designated sites.

SCI species using SPAs within Dublin Bay i.e. South Dublin Bay and River Tolka Estuary SPA, Malahide Estuary SPA North Bull Island SPA and Baldoyle Bay SPA could potentially forage on lands outside the SPA boundaries on or near the proposed development site. Therefore noise from construction works and/or operational activity could potentially impact on these SCI species.

Process wastewater and sanitary wastewater will discharge to the Irish Water foul sewer which will ultimately discharge to South Dublin Bay via Ringsend Wastewater Treatment Plant (WWTP).

Therefore, a source-pathway-receptor link has been identified between the source (proposed development) and the receptors (South Dublin Bay and River Tolka Estuary SPA, Malahide Estuary SPA North Bull Island SPA, Baldoyle Bay SPA, Rogerstown Estuary SPA and North Dublin Bay SAC) via a potential pathway (loss of *ex situ* foraging habitat, disturbance and

surface water run-off during construction and/or operational phases, wastewater discharges and the spread of invasive species). Qualifying species and habitats within these sites could therefore potentially be impacted via a reduction in water quality, disturbance from increased noise and activity and/or the spread of invasive species.

The South Dublin Bay and River Tolka Estuary SPA, Malahide Estuary SPA North Bull Island SPA, Baldoyle Bay SPA, Rogerstown Estuary SPA and North Dublin Bay SAC are of conservation significance for the occurrence of good examples of habitats and species that are listed on Annex I and Annex II of the EU Habitats Directive and Annex I of the EU Birds Directive. Further information on the South Dublin Bay and River Tolka Estuary, Malahide Estuary SPA North Bull Island SPA, Baldoyle Bay SPA, Rogerstown Estuary SPA and North Dublin Bay SAC are provided below and full site synopses included **Appendix 1**.

Given the distances involved, the lack of a hydrological connection and the dilution provided within Dublin Bay, no potential impact has been identified between the proposed development and any other Natura 2000 sites.

Table 1. European sites and their location relative to the proposed development

Site	Code	Qualifying Interests/Special Conservation Interests	Distance/Potential Source-Pathway-Receptor Link
Special Protection Areas (SPA)			
South Dublin Bay and River Tolka Estuary SPA	004024	Birds A162 Redshank (<i>Tringa totanus</i>) A193 Common Tern (<i>Sterna hirundo</i>) A157 Bar-tailed Godwit (<i>Limosa lapponica</i>) A130 Oystercatcher (<i>Haematopus ostralegus</i>) A141 Grey Plover (<i>Pluvialis squatarola</i>) A149 Dunlin (<i>Calidris alpina</i>) A137 Ringed Plover (<i>Charadrius hiaticula</i>) A194 Arctic Tern (<i>Sterna paradisaea</i>) A192 Roseate Tern (<i>Sterna dougallii</i>) A143 Knot (<i>Calidris canutus</i>) A179 Black-headed Gull (<i>Chroicocephalus ridibundus</i>) A144 Sanderling (<i>Calidris alba</i>) A046 Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) Habitats Wetlands	8.0 km southeast. Although unlikely a potential source-pathway-receptor link has been identified between the source (proposed development) and the receptor (South Dublin Bay and River Tolka Estuary SPA) via a potential pathway (loss of foraging habitat, disturbance and surface water run-off during construction and/or operational phases, wastewater discharges and the spread of invasive species).

Site	Code	Qualifying Interests/Special Conservation Interests	Distance/Potential Source-Pathway-Receptor Link
Malahide Estuary (Broadmeadow/Swords) SPA	004025	Birds A130 Oystercatcher (<i>Haematopus ostralegus</i>) A005 Great Crested Grebe (<i>Podiceps cristatus</i>) A162 Redshank (<i>Tringa totanus</i>) A067 Goldeneye (<i>Bucephala clangula</i>) A141 Grey Plover (<i>Pluvialis squatarola</i>) A149 Dunlin (<i>Calidris alpina</i>) A046 Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) A054 Pintail (<i>Anas acuta</i>) A048 Shelduck (<i>Tadorna tadorna</i>) A069 Red-breasted Merganser (<i>Mergus serrator</i>) A143 Knot (<i>Calidris canutus</i>) A156 Black-tailed Godwit (<i>Limosa limosa</i>) A140 Golden Plover (<i>Pluvialis apricaria</i>) A157 Bar-tailed Godwit (<i>Limosa lapponica</i>) Habitats Wetlands	9.8 km northeast. Although unlikely a potential source-pathway-receptor link has been identified between the source (proposed development) and the receptor (Malahide Estuary (Broadmeadow/Swords) SPA) via a potential pathway (loss of foraging habitat, disturbance during construction and/or operational phases, wastewater discharges and the spread of invasive species).
North Bull Island SPA	004006	Birds A179 Black-headed Gull (<i>Chroicocephalus ridibundus</i>)	10.5 km east. Although unlikely a potential source-pathway-receptor link has been identified between the source (proposed development) and the receptor

Site	Code	Qualifying Interests/Special Conservation Interests	Distance/Potential Link	Source-Pathway-Receptor
		<p>A048 Shelduck (<i>Tadorna tadorna</i>)</p> <p>A054 Pintail (<i>Anas acuta</i>)</p> <p>A160 Curlew (<i>Numenius arquata</i>)</p> <p>A157 Bar-tailed Godwit (<i>Limosa lapponica</i>)</p> <p>A046 Light-bellied Brent Goose (<i>Branta bernicla hrota</i>)</p> <p>A056 Shoveler (<i>Anas clypeata</i>)</p> <p>A169 Turnstone (<i>Arenaria interpres</i>)</p> <p>A141 Grey Plover (<i>Pluvialis squatarola</i>)</p> <p>A052 Teal (<i>Anas crecca</i>)</p> <p>A144 Sanderling (<i>Calidris alba</i>)</p> <p>A130 Oystercatcher (<i>Haematopus ostralegus</i>)</p> <p>A140 Golden Plover (<i>Pluvialis apricaria</i>)</p> <p>A149 Dunlin (<i>Calidris alpina</i>)</p> <p>A156 Black-tailed Godwit (<i>Limosa limosa</i>)</p> <p>A162 Redshank (<i>Tringa totanus</i>)</p> <p>A143 Knot (<i>Calidris canutus</i>)</p> <p>Habitats</p> <p>Wetlands</p>	<p>(North Bull Island SPA) via a potential pathway (loss of foraging habitat, disturbance and surface water run-off during construction and/or operational phases, wastewater discharges and the spread of invasive species).</p>	

Site	Code	Qualifying Interests/Special Conservation Interests	Distance/Potential Source-Pathway-Receptor Link
Baldoyle Bay SPA	004016	Birds A140 Golden Plover (<i>Pluvialis apricaria</i>) A137 Ringed Plover (<i>Charadrius hiaticula</i>) A048 Shelduck (<i>Tadorna tadorna</i>) A046 Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) A157 Bar-tailed Godwit (<i>Limosa lapponica</i>) A141 Grey Plover (<i>Pluvialis squatarola</i>) Habitats Wetlands	11.7 km east. Although unlikely a potential source-pathway-receptor link has been identified between the source (proposed development) and the receptor (Baldoyle Bay SPA) via a potential pathway (loss of foraging habitat, disturbance during construction and/or operational phases, wastewater discharges and the spread of invasive species).
Rogerstown Estuary SPA	004015	Birds A149 Dunlin (<i>Calidris alpina</i>) A046 Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) A048 Shelduck (<i>Tadorna tadorna</i>) A137 Ringed Plover (<i>Charadrius hiaticula</i>) A141 Grey Plover (<i>Pluvialis squatarola</i>) A156 Black-tailed Godwit (<i>Limosa limosa</i>) A056 Shoveler (<i>Anas clypeata</i>) A043 Greylag Goose (<i>Anser anser</i>) A130 Oystercatcher (<i>Haematopus ostralegus</i>)	14.2 km northeast. Although unlikely a potential source-pathway-receptor link has been identified between the source (proposed development) and the receptor (Rogerstown Estuary SPA) via a potential pathway (loss of foraging habitat, disturbance during construction and/or operational phases, wastewater discharges and the spread of invasive species).

Site	Code	Qualifying Interests/Special Conservation Interests	Distance/Potential Link	Source-Pathway-Receptor
		A162 Redshank (<i>Tringa totanus</i>) A143 Knot (<i>Calidris canutus</i>) Habitats Wetlands		
Special Areas of Conservation (SAC)				
Malahide Estuary SAC	000205	Habitats 1140 Mudflats and sandflats not covered by seawater at low tide 1310 Salicornia and other annuals colonising mud and sand 1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) 1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>) 2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)*	9.8 km northeast. No viable pathway identified.	
North Dublin Bay SAC	000210	Habitats 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 Salicornia and other annuals colonising mud and sand 1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) 1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>)	10.4 km southeast. Although unlikely, a potential source-pathway-receptor link has been identified between the source (proposed development) and the receptor (North Dublin Bay SAC) via a potential pathway (surface water run-off during construction and/or operational phases, wastewater discharges and the spread of invasive species).	

Site	Code	Qualifying Interests/Special Conservation Interests	Distance/Potential Link	Source-Pathway-Receptor
		2110 Embryonic shifting dunes 2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)* 2190 Humid dune slacks Species 1395 Petalwort (<i>Petalophyllum ralfsii</i>)		
South Dublin Bay SAC	000206	Habitats 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 Salicornia and other annuals colonising mud and sand 2110 Embryonic shifting dunes	10.7 km east. No pathway exists	
Baldoyle Bay SAC	000199	Habitats 1140 Mudflats and sandflats not covered by seawater at low tide 1310 Salicornia and other annuals colonising mud and sand 1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) 1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>)	11.8 km east. No pathway exists	
Rye Water Valley/Cartron SAC	001398	Habitats 7220 Petrifying springs with tufa formation (Cratoneurion)*	12.1 km southwest, No pathway exists	

Site	Code	Qualifying Interests/Special Conservation Interests	Distance/Potential Link	Source-Pathway-Receptor
		Species 1014 Narrow-mouthed Whorl Snail (<i>Vertigo angustior</i>) 1016 Desmoulin's Whorl Snail (<i>Vertigo moulinsiana</i>)		
Rogerstown Estuary SAC	000208	Habitats 1130 Estuaries 1140 Mudflats and sandflats not covered by seawater at low tide 1310 Salicornia and other annuals colonising mud and sand 1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) 1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>) 2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)*	13.1 km northeast. No pathway exists	



Figure 3.1

Figure 3. Natura 2000 Sites within likely zone of impact of proposed development site | Source: EPA Envision mapping <https://gis.epa.ie/EPAMaps/> | Not to scale

5.2 European Sites within Likely Zone of Impact

The EU Habitats Directive contains a list of habitats (Annex I) and species (Annex II) for which SACs must be established by Member States. Similarly, the EU Birds Directive contains lists of important bird species (Annex I) and other migratory bird species for which SPAs must be established. Those that are known to occur at a site are referred to as ‘qualifying interests’ and are listed in the Natura 2000 forms which are lodged with the EU Commission by each Member State. A ‘qualifying interest’ is one of the factors (such as the species or habitat that is present) for which the site merits designation. The National Parks and Wildlife Service (NPWS) are responsible for the designation of SACs and SPAs in Ireland.

The current conservation objectives for the South Dublin Bay and River Tolka Estuary SPA, Malahide Estuary SPA North Bull Island SPA, Baldoyle Bay SPA, Rogerstown Estuary SPA and North Dublin Bay SAC are included in the following publications:

NPWS (2015) *Conservation Objectives: South Dublin Bay and River Tolka Estuary SPA 004024. Version 1*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2013) *Conservation Objectives: Malahide Estuary SPA 004025. Version 1*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2015) *Conservation Objectives: North Bull Island SPA 004006. Version 1*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2013) *Conservation Objectives: Baldoyle Bay SPA 004016. Version 1*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2013) *Conservation Objectives: Rogerstown Estuary SPA 004015. Version 1*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2013) *Conservation Objectives: North Dublin Bay SAC 000206. Version 1*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network. European and national legislation places a collective obligation on Ireland and its citizens to maintain at favourable conservation status sites designated as Special Areas of Conservation and Special Protection Areas. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level. Favourable conservation status of a habitat is achieved when its natural range, and area it covers within that range, is stable or increasing, and the ecological factors that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and the conservation status of its typical species is favourable.

5.2.1 South Dublin Bay and River Tolka Estuary SPA

The South Dublin Bay and River Tolka Estuary SPA comprises a substantial part of Dublin Bay. It includes the intertidal area between the River Liffey and Dun Laoghaire, and the estuary of the River Tolka to the north of the River Liffey, as well as Booterstown Marsh. A portion of the shallow marine waters of the bay is also included. The Site Synopsis for the SPA is included in **Appendix 1** of this report and the information is summarised below.

Qualifying Interests

The site includes wetland habitat that supports a variety of bird species, as listed in **Table 2**.

Table 2. Qualifying interests for South Dublin Bay and River Tolka Estuary SPA

Species/Habitat	Code
Light Bellied Brent Goose (<i>Branta bernicla hrota</i>)	A046
Oystercatcher (<i>Haematopus ostralegus</i>)	A130
Ringed Plover (<i>Charadrius hiaticula</i>)	A137
Grey Plover (<i>Pluvialis squatarola</i>)	A141
Knot (<i>Calidris canutus</i>)	A143
Sanderling (<i>Calidris alba</i>)	A144
Dunlin (<i>Calidris alpina alpina</i>)	A149
Bar-tailed Godwit (<i>Limosa lapponica</i>)	A157
Redshank (<i>Tinga tetanus</i>)	A162
Black headed Gull (<i>Chroicocephalus ridibundus</i>)	A179
Roseate Tern (<i>Sterna dougallii</i>)	A192
Common Tern (<i>Sterna hirundo</i>)	A193
Arctic Tern (<i>Sterna paradisaea</i>)	A194
Wetlands	A999

The site is an SPA for: Light-bellied Brent Goose, Oystercatcher, Ringed Plover, Grey Plover, Knot, Sanderling, Dunlin, Bar-tailed Godwit, Redshank, Black-headed Gull, Roseate Tern, Common Tern and Arctic Tern. The E.U. Birds Directive pays particular attention to wetlands, and as these form part of the SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Conservation Objectives

The conservation objective is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.

The main threats identified for this site include urbanised areas/human habitation, reclamation of the land from sea/estuary/marsh, industrial or commercial areas, roads and motorways, discharges, eutrophication from natural sources, recreational activities such as nautical sports, leisure fishing and bait digging/collection and from walking, horse-riding and use of non-motorised vehicles.

5.2.2 Malahide Estuary (Broadmeadow/Swords) SPA

Malahide Estuary is situated in north Co. Dublin, between the towns of Malahide and Swords. The site encompasses the estuary, saltmarsh habitats and shallow subtidal areas at the mouth of the estuary. The Site Synopsis for the SPA is included in Appendix 1 of this report and the information is summarised below.

Qualifying Interests

The site includes wetland habitat that supports a variety of bird species, as listed in **Table 3**.

Table 3. Qualifying interests for Malahide Estuary (Broadmeadow/Swords) SPA

Species/Habitat	Code
Great Crested Grebe (<i>Podiceps cristatus</i>)	A005
Brent Goose (<i>Branta bernicla hrota</i>)	A046
Shelduck (<i>Tadorna tadorna</i>)	A048
Pintail (<i>Anas acuta</i>)	A054
Goldeneye (<i>Bucephala clangula</i>)	A067
Red-breasted Merganser (<i>Mergus serrator</i>)	A069
Oystercatcher (<i>Haematopus ostralegus</i>)	A130
Golden Plover (<i>Pluvialis apricaria</i>)	A140
Grey Plover (<i>Pluvialis squatarola</i>)	A141
Knot (<i>Calidris canutus</i>)	A143
Dunlin (<i>Calidris alpina alpina</i>)	A149
Black-tailed Godwit (<i>Limosa limosa</i>)	A156
Bar-tailed Godwit (<i>Limosa lapponica</i>)	A157
Redshank (<i>Tinga tetanus</i>)	A162
Wetlands	A999

The site is an SPA for: Great Crested Grebe, Light-bellied Brent Goose, Shelduck, Pintail, Goldeneye, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Knot, Dunlin, Black-tailed Godwit, Bar-tailed Godwit and Redshank. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Conservation Objectives

The conservation objective is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.

The Natura Form for Malahide Estuary SPA identified it as a substantial river, which drains a mainly agricultural, though increasingly urbanised, catchment. The inner part of the estuary is heavily used for water sports, which causes disturbance to bird populations. Paths, tracks and cycle tracks as well as through-walking, horse-riding and non- motorised vehicles can impact the site through disturbance of habitat. A section of the outer estuary has been in-filled for a marina and housing development (land reclamation/urbanisation/human habitation). Aquatic flora and fauna are vulnerable to invasive non-native species and all forms of pollution such as that which can occur as a result of agricultural run-off and industrial and municipal effluents. The bridge viaduct and railway have also been identified as pressures.

5.2.3 North Bull Island SPA

This site covers all of the inner part of north Dublin Bay, with the seaward boundary extending from the Bull Wall lighthouse across to Drumleck Point at Howth Head.

The Site Synopsis for the SPA is included in **Appendix 1** of this report and the information is summarised below.

Qualifying Interests

The site includes wetland habitat that supports a variety of bird species, as listed in **Table 4**.

Table 4. Qualifying Interests for North Bull Island SPA

Species/Habitat	Code
Light Bellied Brent Goose (<i>Branta bernicla hrota</i>)	A046
Shelduck (<i>Tadorna tadorna</i>)	A048
Teal (<i>Anas crecca</i>)	A052
Pintail (<i>Anas acuta</i>)	A054
Shoveler (<i>Anas clypeata</i>)	A056
Oystercatcher (<i>Haematopus ostralegus</i>)	A130
Golden Plover (<i>Pluvialis apricaria</i>)	A140
Grey Plover (<i>Pluvialis squatarola</i>)	A141
Knot (<i>Calidris canutus</i>)	A143
Sanderling (<i>Calidris alba</i>)	A144
Dunlin (<i>Calidris alpina alpina</i>)	A149
Black-tailed Godwit (<i>Limosa limosa</i>)	A156
Bar-tailed Godwit (<i>Limosa lapponica</i>)	A157
Curlew (<i>Numenius arquata</i>)	A160
Redshank (<i>Tinga tetanus</i>)	A162
Turnstone (<i>Arenaria interpres</i>)	A169

Species/Habitat	Code
Black-headed Gull (<i>Chroicocephalus ridibundus</i>)	A179
Wetlands	A999

The site is an SPA for: Light-bellied Brent Goose, Shelduck, Teal, Pintail, Shoveler, Oystercatcher, Golden Plover, Grey Plover, Knot, Sanderling, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Turnstone and Black-headed Gull. The site is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Conservation Objectives

The conservation objective is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.

North Bull Island SPA, given its location on the southern border of Fingal adjacent to Dublin City Bay, pressures arise on the site from shipping lanes, proximity to industrial or commercial areas, presence of roads, bridges and viaducts and discharges to the marine environment. Pressures also arise from recreational uses in the area such as golf courses, digging/collection, walking, horse-riding and non-motorised vehicles and nautical sports. The presence of continuous urbanisation of the city suburbs is also a pressure on the site.

5.2.4 Baldoyle SPA

Baldoyle Bay, located to the north and east of Baldoyle and to the south of Portmarnock, Co. Dublin, is a relatively small, narrow estuary separated from the open sea by a large sand dune system. Two small rivers, the Mayne River and the Sluice River, flow into the inner part of the estuary.

The Site Synopsis for the SPA is included in **Appendix 1** of this report and the information is summarised below.

Qualifying Interests

The site includes wetland habitat that supports a variety of bird species, as listed in **Table 5**.

Table 5. Qualifying interests for Baldoyle Bay SPA

Species/Habitat	Code
Brent Goose (<i>Branta bernicla hrota</i>)	A046
Shelduck (<i>Tadorna tadorna</i>)	A048
Ringed Plover (<i>Charadrius hiaticula</i>)	A137
Golden Plover (<i>Pluvialis apricaria</i>)	A140

Species/Habitat	Code
Grey Plover (<i>Pluvialis squatarola</i>)	A141
Bar-tailed Godwit (<i>Limosa lapponica</i>)	A157
Wetlands	A999

The site is an SPA for: Light-bellied Brent Goose, Shelduck, Ringed Plover, Golden Plover, Grey Plover and Bar-tailed Godwit. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Conservation Objectives

The conservation objective is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.

The main threats identified for the SPA are land reclamation, the presence of urbanised areas in close proximity, discharges, hunting, golf courses, roads/motorways, bait digging/collection, invasive non-native species, walking/horse-riding and non-motorised vehicles, and eutrophication from natural sources.

5.2.4 Rogerstown Estuary SPA

Rogerstown Estuary is situated about 2km north of Donabate in north County Dublin. It is a relatively small, funnel shaped estuary separated from the sea by a sand and shingle peninsula; the site extends eastwards to include an area of shallow marine water.

The Site Synopsis for the SPA is included in **Appendix 1** of this report and the information is summarised below.

Qualifying Interests

The site includes wetland habitat that supports a variety of bird species, as listed in **Table 6**.

Table 6. Qualifying interests for Rogerstown Estuary SPA

Species/Habitat	Code
Greylag Goose (<i>Anser anser</i>)	A043
Brent Goose (<i>Branta bernicla hrota</i>)	A046
Shelduck (<i>Tadorna tadorna</i>)	A048
Shoveler (<i>Anas clypeata</i>)	A056
Oystercatcher (<i>Haematopus ostralegus</i>)	A130
Ringed Plover (<i>Charadrius hiaticula</i>)	A137
Golden Plover (<i>Pluvialis apricaria</i>)	A140

Species/Habitat	Code
Grey Plover (<i>Pluvialis squatarola</i>)	A141
Knot (<i>Calidris canutus</i>)	A143
Dunlin (<i>Calidris alpina alpina</i>)	A149
Black-tailed Godwit (<i>Limosa limosa</i>)	A156
Redshank (<i>Tinga tetanus</i>)	A162
Wetlands	A999

The site is an SPA for: Greylag Goose, Light-bellied Brent Goose, Shelduck, Shoveler, Oystercatcher, Ringed Plover, Grey Plover, Knot, Dunlin, Black-tailed Godwit and Redshank. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Conservation Objectives

The conservation objective is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.

The inner part of Rogerstown Estuary SPA has been damaged by the refuse tip, which covers 40 hectares of mudflat and associated pressures of disposal of industrial, household and recreational facility waste. The estuary is popular for sports and recreation and so nautical sports, golf courses, bait digging/collection and hunting are pressures. Pressures from agriculture arise through grazing and fertilisation. Dispersed habitation patterns and invasive non-native species and land reclamation/drying-out have also been identified as threats to the site.

5.2.5 North Dublin Bay SAC

This site covers the inner part of north Dublin Bay, the seaward boundary extending from the Bull Wall lighthouse across to the Martello Tower at Howth Head. The North Bull Island is the focal point of this site. The Site Synopsis for the SAC is included in **Appendix 1** of this report and the information is summarised below.

Qualifying Interests

Table 7. Qualifying interests for North Dublin Bay SAC

Species/Habitat	Code
Tidal Mudflats and Sandflats	1140
Annual vegetation of drift lines	1210
<i>Salicornia</i> Mud	1310

Species/Habitat	Code
Atlantic Salt Meadows	1330
Mediterranean Salt Meadows	1410
Embryonic shifting dunes	2110
Marram Dunes (White Dunes)	2120
Fixed Dunes (Grey Dunes)*	2130
Humid Dune Slacks	2190
Petalwort (<i>Petalophyllum ralfsii</i>)	1395
* Denotes a priority habitat	

Conservation Objectives

The conservation objectives are to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected (Table 7).

The SAC is under pressure/threat from the following: urbanised areas/human habitation, dispersed habitation, golf courses, bait digging/collection, leisure fishing, walking, horse-riding and non-motorised vehicles, trampling, overuse, camping and caravanning, nautical sports, agricultural improvement, stock feeding, grazing, undergrazing, fertilisation, erosion, competition, invasive non-native species, motorised vehicles, paths, tracks, restructuring, coastal protection works, disposal of household waste, sand and gravel extraction, other pollution, sports pitches, burning, routes, autoroutes and industrial/commercial areas.

6. Water Quality data

6.1 River Basin Management Plan 3rd Cycle

The Water Framework Directive (WFD) sets out the environmental objectives which are required to be met through the process of river basin planning and implementation of those plans. Specific objectives are set out for surface water, groundwater and protected areas. The challenges that must be overcome in order to achieve those objectives are very significant. Therefore, a key purpose of the River Basin Management Plan (RBMP) is to set out priorities and ensure that implementation is guided by these priorities.

The EPA has published an updated draft Catchment Assessment for each of the 46 catchments. These assessments provide an overview of the situation in the catchment, draw comparison between Cycle 2 and Cycle 3, and will help support the draft River Basin Management Plan 2022-2027 public consultation process. The third cycle RBMP, which was published in July 2022, aims to build on the progress made during the second cycle. Key measures during the first cycle included the licensing of urban waste-water discharges (with an associated investment in urban waste-water treatment) and the implementation of the Nitrates Action Programme (Good Agricultural Practice Regulations). The former measure has

resulted in significant progress in terms both of compliance levels and of the impact of urban wastewater on water quality. The latter provides a considerable environmental baseline which all Irish farmers must achieve and has resulted in improving trends in the level of nitrates and phosphates in rivers and groundwater. It is acknowledged, however, that sufficient progress has not been made in developing and implementing supporting measures during the first and second cycles.

Overall, RBMP assesses the quality of water in Ireland and presents detailed scientific characterisation of water bodies. The characterisation process also takes into account wider water quality considerations, such as the special water-quality requirements of protected areas. The characterisation process identifies those water bodies that are *At Risk* of not meeting the objectives of the WFD, and the process also identifies the significant pressures causing this risk. Based on an assessment of risk and pressures, a programme of measures has been developed to address the identified pressures and work towards achieving the required objectives for water quality and protected areas. Data relating to the watercourses within the study area is provided in **Table 8** and the location of these shown in **Figure 14**.

Table 8. Water Framework Directive Data – Relevant data

Catchment: Liffey and Dublin Bay HA 09		
<p>This catchment includes the area drained by the River Liffey and by all streams entering tidal water between Sea Mount and Sorrento Point, Co. Dublin, draining a total area of 1,616km². The largest urban centre in the catchment is Dublin City. The other main urban centres are Dun Laoghaire, Lucan, Clonee, Dunboyne, Leixlip, Maynooth, Kilcock, Celbridge, Newcastle, Rathcoole, Clane, Kill, Sallins, Johnstown, Naas, Newbridge, Athgarvan, Kilcullen and Blessington. The total population of the catchment is approximately 1,255,000. The Liffey catchment contains the largest population of any catchment in Ireland and is characterised by a sparsely populated, upland south eastern area underlain by granites and a densely populated, flat, low lying limestone area over the remainder of the catchment basin.</p> <p>The proposed development site is located within the Tolka_SC_020 sub catchment. There is generally poor water quality throughout this sub catchment, both with regard to biology/ecology and chemistry. Ecological Status in both the Tolka_040 and 050 water bodies was Poor in the 2013-2015 monitoring cycle continuing previous Poor Status in this water bodies and are AT RISK. Tolka_060 is also AT RISK due to Diffuse Urban and Combined Sewer Overflows. There are a lot of industrial pressures throughout the sub-catchment, but urban diffuse and misconnections are providing the majority of the problems. There have been misconnection studies initiated and extensive studies throughout the Tolka Valley Park area. Illegal dumping is also an issue in the Dunsink Lane area. There have also been improvement attempts made with a large scale SUDS programme in the Ballymun area.</p>		
Waterbody	Significant Pressure	WFD Status
Tolka_050	Urban runoff, urban wastewater	At Risk
Tolka_060	Urban runoff, urban wastewater	At Risk
Tolka_Estuary	Urban wastewater	At Risk

Source: EPA www.catchments.ie

6.2 Urban Wastewater Treatment Directive

The Wastewater Discharge (Authorisation) Regulations 2007 (S.I. 684 of 2007) gives effect to the requirements of the Urban Wastewater Treatment Directive (Directive 91/271/EEC) and the Water Framework Directive (2000/60/EC) in Ireland. The Urban Wastewater Treatment Directive (UWWTD) lays down the requirements for the collection, treatment and discharge of urban waste-water and specifies the quality standards which must be met — based on agglomeration size — before treated waste-water is released into the environment.

The priority objective for this river basin planning cycle is to secure compliance with the Urban Waste Water Treatment Directive and to contribute to the improvement and protection of waters in keeping with the water-quality objectives established by this Plan. Achieving this objective entails addressing waste-water discharges and overflows where protected areas (i.e. designated bathing waters, shellfish waters) or high-status waters are at risk from urban waste-water pressures.

Treated wastewater from the proposed development site will ultimately be discharged to the transitional waters (Liffey Estuary Lower) / coastal waters (Dublin Bay) via a primary discharge point from the Ringsend wastewater treatment plant (WWTP). The water quality within the transitional waters of Liffey Estuary Lower and the coastal waters of Dublin Bay is of an acceptable quality i.e., status is defined as moderate (Liffey Estuary Lower) and Good (Dublin Bay).

The 2021 Annual Environmental Report (AER) for the Ringsend WWTP notes that the primary discharge from the wastewater treatment plant does not have an observable negative impact on the water quality in the near field of the discharge and in the Liffey and Tolka Estuaries.



Figure 5. WFD waterbodies in the vicinity of the proposed development | Source: EPA Envision mapping | Not to scale

7. Site Survey

7.1 Habitats

A survey was completed during visits to the project site on the 4th of December 2020 and 1st March 2021 and on the 27th of August 2022. These were conducted following desktop research regarding the details of the proposed project and the location of the project site in relation to the nearby ecological receptors. The aim of the survey is to provide information on habitats and species within the area of the proposed project and within the receiving environment. Habitats were mapped according to the classification scheme outlined in the Heritage Council publication *A Guide to Habitats in Ireland* (Fossitt, 2000) and following the guidelines contained in *Best Practice Guidance for Habitat Survey and Mapping* (Heritage Council, 2011).

An overview of habitats recorded within the proposed development site is provided in **Figure 6** and these habitats are described in **Table 9**. Photographs of the site are also included below.

The proposed development site contains two agricultural fields separated by an overgrown treeline. The site covers a mixture of flat to undulating land with a high point of c. 90m at an old sand pit/quarry (at the centre of the eastern field) to a low point of c. 80m along the southern site boundary. Soils are a mixture of dry minerals with sand from the old quarry site.

The larger eastern field was formerly used for tillage farming, but this area is no longer cultivated. The centre of this field was historically used as a sandpit and the dry mineral and sandy soils from this activity persist in the field. The smaller western field was formerly grazed, most likely by horses, but has been ungrazed for several years.

A mix of Hedgerow (WL1)/Treeline (WL2) occurs along the southern and western site boundaries of the site. The dominant species within this boundary habitat are Hawthorn (*Crataegus monogyna*), however Blackthorn (*Prunus spinosa*), Elm (*Ulmus sp*), Ash (*Fraxinus excelsior*), and Downy Birch (*Betula pubescens*) are also present.

The internal Boundary has more species diversity than the external boundaries, including elm (*Ulmus spp.*), Ash (*Fraxinus excelsior*) and one Oak (*Quercus robur*) which is located outside the redline boundary. All hedges are in excess of 150 years old and are a higher value habitat at a local level. Both Elm disease (*Ophiostoma ulmi*) and ash dieback disease (*Hymenoscyphus fraxinus*) are present.

The larger eastern field is classified as Tilled land (BC3). This area was previously cropped for cereals but has not been actively farmed for tillage for several years. Ground at the centre of this field is slightly raised due to its previous use as a sand pit/quarry and supports a mosaic of Neutral Grassland (GS1)/Scrub (WS1). In the absence of active management, common ruderal species have become established i.e., Dandelion (*Taraxacum spp.*), Willowherb (*Epilobium spp.*), Creeping Thistle (*Cirsium arvense*) and Ragworts (*Senecio spp.*). These species are of value for seed eating bird species such as Linnet (*Linaria cannabina*) which was recorded here.

A Wet Grassland (GS4)/Scrub (WS1) mosaic has become established on the boundary of the study site. Scrub species such as Great Willow, Blackthorn and Hawthorn are spreading inwards from the boundary hedgerows. The best example of this habitat is located in the north-

eastern corner of the site. This area has gleyed soil conditions and the waterlogging has allowed species such as Hard Rush (*Juncus inflexus*) and Canary Grass (*Phalaris arundinacea*) to grow. Other wet grassland species recorded within the study area include Meadowsweet (*Filipendula ulmaria*), Marsh Thistle (*Cirsium palustre*) and Silverweed (*Potentilla anserina*).

On the western field where grazing has not taken place for 2-3 years, Wet Grassland (GS4) has formed a mosaic with Neutral Grassland (GS1). The area has reverted to rank grassland with encroachment from Scrub (WS1) in particular hawthorn. Buddleia (*Buddleia davidii*) was also recorded within this area. A small manmade berm spans both fields near the southern boundary of the site and Neutral grassland (GS1) has established along its ridge. Species recorded within neutral grassland habitat include Meadow Vetchling (*Lathyrus pratensis*), Cow Parsley (*Anthriscus sylvestris*) and coarse grasses such as False Oat Grass (*Arrhenatherum elatius*) and Cocksfoot (*Dactylis glomerata*). Rosebay Willowherb (*Chamaenerion angustifolium*) was growing in thick patches during the August survey, and Creeping Cinquefoil (*Potentilla reptans*), Common Fleabane (*Pulicaria dysenterica*) and Tufted Vetch (*Vicia cracca*) were locally common.

There are no watercourses within the study area.

Table 9. Habitats recorded within the proposed development site.

Habitat Type	Habitat Description
Hedgerow (WL1)/Treeline (WL2)	<p>A mix of Hedgerow (WL1)/Treeline (WL2) are located on the southern and western boundaries and on the internal boundary between the two fields. The dominant species is Hawthorn, but Blackthorn <i>Prunus spinosa</i>, Elm <i>Ulmus spp.</i>, Ash <i>Fraxinus excelsior</i>, and Downy Birch <i>Betula pubescens</i> were also noted. The boundary between the two fields is dominated by Ash and Elm.</p> <p>This habitat does not correspond to an Annex I habitat or qualifying habitat for Natura 2000 sites.</p>
Tilled Land (BC3)	<p>The larger eastern field is classified as Tilled land (BC3). This area was previously cropped for cereals but has not been actively farmed for tillage for several years. In the absence of active management, common ruderal species have become established i.e., Dandelion (<i>Taraxacum spp.</i>), Willowherbs (<i>Epilobium spp.</i>) and ragworts (<i>Senecio spp.</i>). These species are of value for seed eating bird species such as Linnet (<i>Linaria cannabina</i>) which was recorded here.</p> <p>This habitat does not correspond to an Annex I habitat or qualifying habitat for Natura 2000 sites.</p>
Wet Grassland (GS4)/Scrub (WS1)	<p>A Wet Grassland (GS4)/Scrub (WS1) mosaic has become established on the boundary of the study site. The best example of this habitat is located in the north-eastern corner of the site. This area has gleyed soil conditions and the waterlogging. Wet grassland (GS4) has links with Annex I: Wet grassland may contain examples of the annexed habitat, 'Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) (6410)'. However, this habitat does not occur on-site.</p> <p>This habitat does not correspond to an Annex I habitat or qualifying habitat for Natura 2000 sites.</p>

Habitat Type	Habitat Description
Neutral Grassland (GS1)	<p>Neutral grassland (GS1) has Links with Annex I: Calcareous grasslands with either high numbers or diversity of orchids correspond to the priority habitat, 'semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometea) (*important orchid sites) (6210)'. However, this habitat does not occur on-site.</p> <p>This habitat does not correspond to an Annex I habitat.</p>
Neutral Grassland (GS1)/Scrub (WS1) Mosaic	<p>Ground at the centre of this field is slightly raised due to its previous use as a sand pit/quarry and supports a Neutral Grassland (GS1)/Scrub (WS1) habitat mosaic.</p> <p>Neutral Grassland (GS1) has links with Annex I: Calcareous grasslands with either high numbers or diversity of orchids correspond to the priority habitat, 'semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometea) (*important orchid sites) (6210)'. However, this habitat does not occur on-site.</p> <p>This habitat does not correspond to an Annex I habitat or qualifying habitat for Natura 2000 sites.</p>
Buildings and artificial surfaces BL3	<p>A small local road provides access to the northeast corner of the site and runs along the north-east boundary.</p> <p>This habitat does not correspond to an Annex I habitat or qualifying habitat for Natura 2000 sites.</p>

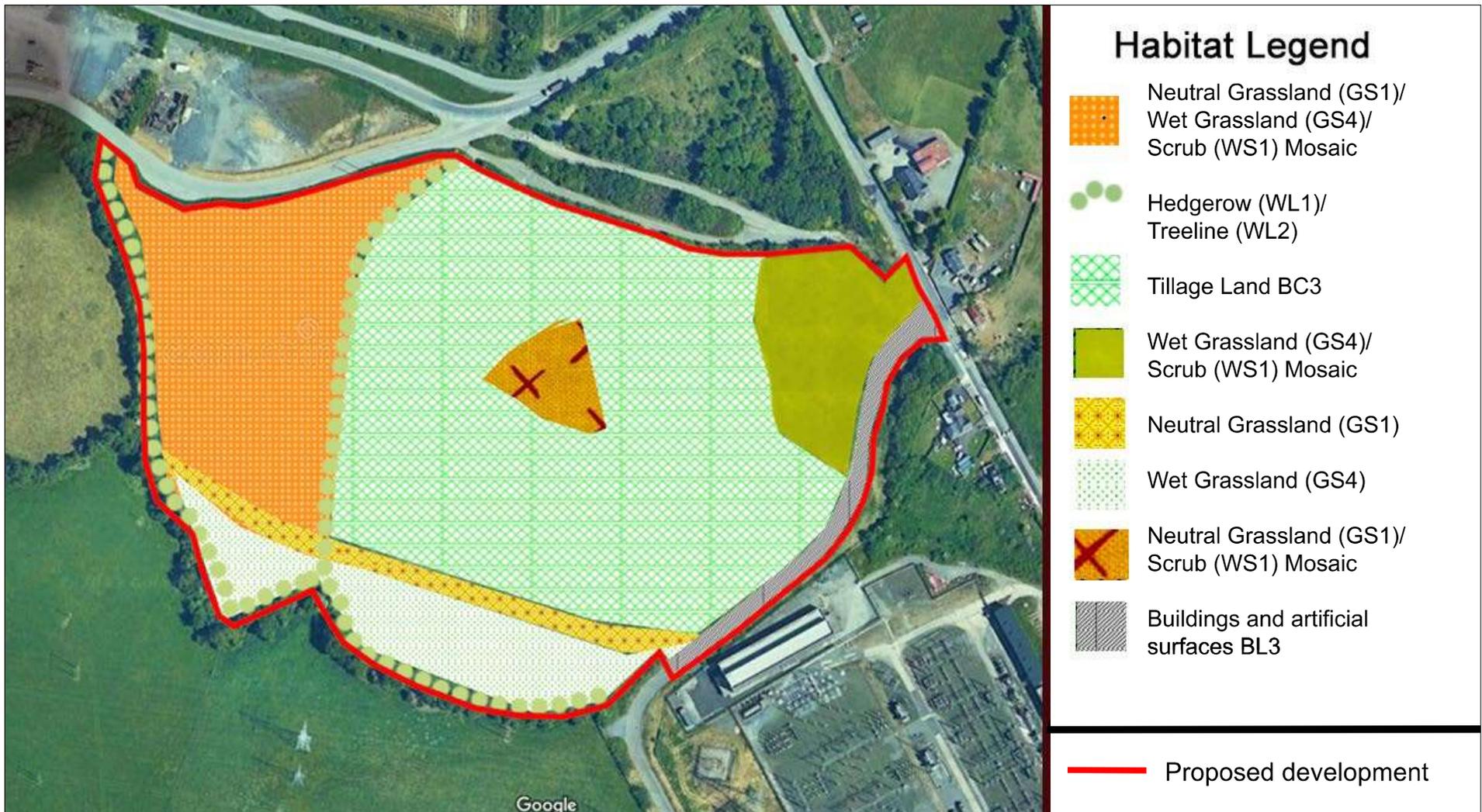


Figure 6. Habitat map of proposed development site



Plate 1. Treeline between eastern and western field



Plate 2. Eastern Field: Entrance at north showing tillage land, neutral grassland and scrub in background.



Plate 3. Western field: Rank grassland-wet and dry, with scrub



Plate 4. Treeline between eastern and western field



Plate 5. Eastern Field: Neutral grassland and scrub at the south of tillage land



Plate 6. Western field: Rank grassland-wet and dry, with scrub

7.2 Birds

Birds species listed in Annex I of the Birds Directive are considered a conservation priority. During the survey, all birds seen or heard within the development site were recorded. Certain

bird species are listed by BirdWatch Ireland as Birds of Conservation Concern in Ireland (BOCCI). These are bird species suffering declines in population size. BirdWatch Ireland and the Royal Society for the Protection of Birds have identified and classified these species by the rate of decline into Red and Amber lists. Red List bird species are of high conservation concern and the Amber List species are of medium conservation. Green listed species are regularly occurring bird species whose conservation status is currently considered favourable. Birds species listed in Annex I of the Birds Directive (2009/147/EC) are considered a conservation priority. Species recorded within the site are shown in **Table 10**.

Table 10. Bird Species recorded site survey 4th December 2020 and 27th August 2022

Species		Birds Directive Annex I	BOCCI	
			Red List	Amber List
<i>Turdus merula</i>	Blackbird			
<i>Corvus cornix</i>	Hooded Crow			
<i>Erithacus rubecula</i>	Robin			
<i>Carduelis cannabina</i>	Linnet			X
<i>Gallinago gallinago</i>	Snipe		X	
<i>Turdus philomelos</i>	Song thrush			
<i>Cyanistes caeruleus</i>	Blue tit			
<i>Troglodytes troglodytes</i>	Wren			
<i>Corvus frugilegus</i>	Rook			
<i>Columba palumbus</i>	Woodpigeon			
<i>Parus major</i>	Great Tit			
<i>Prunella modularis</i>	Dunnock			
<i>Anthus pratensis</i>	Meadow Pipit		X	
<i>Buteo buteo</i>	Buzzard			
<i>Hirundo rustica</i>	Swallow			X
<i>Sylvia atricapilla</i>	Blackcap			

Terrestrial habitats within the proposed development site are of local value for terrestrial bird species that are relatively common in the Irish countryside. Vegetation particularly the early successional, seed producing species, provides some feeding/nesting resources for birds. Two red list and two amber listed species were recorded within the study area i.e., Meadow Pipit, Snipe Linnet and Swallow. The rank grassland within the site is generally not suitable for wading birds, as they find it difficult to move around and feed in such habitats (Chapman 2017). However, Snipe do utilise the wet grassland habitat within the site.

Overall, the proposed development site is of a local value for bird species that are common in the Irish countryside. Given the small size of the site, this is of limited value and the area to be affected is not likely to be a critical feeding resource for bird species in the context of the wider landscape. None of the species listed as SCIs for relevant SPAs South Dublin Bay and River Tolka Estuary SPA, Malahide Estuary SPA North Bull Island SPA, Baldoyle Bay SPA and Rogerstown Estuary SPA were recorded during site surveys and no significant potential habitats for these species occur within the proposed development area.

7.3 Invasive Species

Non-native plants are defined as those plants which have been introduced outside of their native range by humans and their activities, either purposefully or accidentally. Invasive non-native species are so-called as they typically display one or more of the following characteristics or features: (1) prolific reproduction through seed dispersal and/or re-growth from plant fragments; (2) rapid growth patterns; and, (3) resistance to standard weed control methods.

Where a non-native species displays invasive qualities and is not managed it can potentially: (1) out compete native vegetation, affecting plant community structure and habitat for wildlife; (2) cause damage to infrastructure including road carriageways, footpaths, walls and foundations; and, (3) have an adverse effect on landscape quality. The NBDC lists a number of high impact invasive species which have been recorded within the 10km grid square O14 (the 10km OS grid square which overlaps with the proposed development site) (**Table 11**).

Table 11. NBDC list of high impact invasive species recorded in O14

Species name	Species group
Ruddy Duck (<i>Oxyura jamaicensis</i>)	bird
<i>Arthurdendyus triangulatus</i>	flatworm (Turbellaria)
Cherry Laurel (<i>Prunus laurocerasus</i>)	flowering plant
Common Cord-grass (<i>Spartina anglica</i>)	flowering plant
Giant Hogweed (<i>Heracleum mantegazzianum</i>)	flowering plant
Japanese Knotweed (<i>Fallopia japonica</i>)	flowering plant
Eastern Grey Squirrel (<i>Sciurus carolinensis</i>)	terrestrial mammal
American Mink (<i>Mustela vison</i>)	terrestrial mammal
Brown Rat (<i>Rattus norvegicus</i>)	terrestrial mammal

Source NBDC 28/03/23

Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 make it an offence to plant, disperse, allow dispersal or cause the spread of certain species e.g. Japanese knotweed, keep the plant in possession for purpose of sale, breeding, reproduction, propagation, distribution, introduction or release, keep anything from which the plant can be reproduced or propagated from, without a granted licence and keep any vector material for the purposes of breeding, distribution, introduction or release. The Wildlife (Amendment) Act 2000 states that anyone who plants or otherwise causes to grow in a wild state in any place in the State any species of (exotic) flora, or the flowers, roots, seeds or spores of (exotic) flora shall be guilty of an offence. No high-risk invasive species were recorded within the proposed development site.

The medium impact invasive species Buddleia (*Buddleia davidii*) were recorded within western field. These species are listed on the Invasive Species Ireland “Amber List: Recorded Species” (which under the right conditions could represent a significant impact on native species or

habitats). Buddleia is also included in the *NRA Guidelines on the Management of Noxious Weeds and Non-native Species on National Roads* (NRA, 2010) as these species have been shown to have an adverse impact on landscape quality, native biodiversity or infrastructure. This species is not included in the Third Schedule of the Birds and Natural Habitats Regulations 2011 (SI 477 of 2011). Therefore, its presence at the site does not have the potential to lead to an offence under the Birds and Natural Habitats Regulations 2011 (S.I. 477 of 2011).

8. Potential Impacts

Potential impacts could arise from the following:

- Potential impacts from loss of habitat.
- Potential impacts from noise and disturbance
- Potential impacts from surface water runoff during construction
- Potential impacts from surface water during operation
- Potential impacts from wastewater discharges
- Potential impacts from spread of invasive species
- In-combination impacts

8.1 Potential impacts from loss of habitat

The proposed development site is located a considerable distance (8.0km) from the closest Natura 2000 site. Habitats recorded within the proposed development site do not correspond to habitats listed on Annex I of the Habitats Directive. The habitats recorded within the proposed development site are considered of low ecological value. No potential for habitat fragmentation has been identified.

The wintering birds listed as SCIs for South Dublin Bay and River Tolka Estuary SPA, Malahide Estuary SPA North Bull Island SPA, Baldoyle Bay SPA and Rogerstown Estuary SPA are strongly associated with estuarine shoreline areas or wetlands – habitat types absent within the footprint of the proposed development. While it follows that the majority of SCI species do not rely on the food resources available within the footprint of the proposed development a number of SCI species are known to forage inland on terrestrial sites i.e., Light-bellied Brent Goose, Curlew, Oystercatcher, Black-tailed Godwit and Black-headed Gull.

The agricultural lands within the proposed development site include a mix of arable land which has been left fallow and ungrazed agricultural grassland. Under grazing had led to extensive areas of tall, rank grass and rushes that are likely to be avoided by foraging waders as they find it difficult to move around and feed in such habitats (Chapman 2017). Snipe is the only species likely to use dense rushes and this species was recorded during the site visit. The habitats within the development area will be utilised on occasion by common birds for feeding, however the area to be affected does not provide critical feeding resources for bird species in the context of the wider landscape.

In conclusion, given the distance from European sites and the absence of suitable foraging/roosting habitat for SCI birds within the site, the proposed development will not result in any deterioration in habitat quality or loss of foraging habitat for SCI species for South Dublin Bay and River Tolka Estuary SPA, Malahide Estuary SPA North Bull Island SPA, Baldoyle Bay SPA and Rogerstown Estuary SPA.

8.2 Potential impacts from noise and disturbance

Potentially increased noise and disturbance associated with the site works could cause disturbance/displacement of fauna. The potential effects and impacts of disturbance have been widely recognised in wildlife conservation legislation, as has the need to develop conservation measures for birds whilst taking human activities into account. Article 4.4 of the Bird's Directive (79/409/EEC) requires member states to "*take appropriate steps to avoid... any disturbances affecting the birds, in so far as these would be significant having regard to the objectives of this Article*". This specifically relates to conservation measures concerning Annex I species.

As discussed above, while the majority of SCI species for the South Dublin Bay and River Tolka Estuary SPA, Malahide Estuary SPA North Bull Island SPA, Baldoyle Bay SPA and Rogerstown Estuary SPA do not rely on the food resources available within the footprint of the proposed development a number of SCI species are known to forage inland on terrestrial sites i.e. Light-bellied Brent Goose, Curlew, Oystercatcher, Black-tailed Godwit and Black-headed Gull. These species could potentially forage on lands in the vicinity of the proposed development site and could be disturbed by the proposed construction and operational activity.

Noise levels of 70dB and above are regularly cited within the literature as being the threshold beyond which disturbance to estuarine bird species can be predicted to occur (Cutts *et al.* 2013). However, the greatest levels of disturbance response typically occur when the difference between ambient noise levels and peak noise levels is greatest, and when combined with visual human presence (Cutts *et al.*, 2013).

The magnitude and predictability of impacts as a result of disturbance ranges between species, seasons, weather, source and duration of disturbance, degree of previous exposure of the individuals to disturbance and the occurrence of additional disturbances. Most disturbances to wetland birds result in an interruption to normal activity and the displacement of birds over variable distances, often into sub-optimal habitats. This can be critical during severe winters and can lead to a reduction in the carrying capacities of important wintering wetland sites. However, in general studies show that most bird species have the ability to habituate to regular and continual sources of noise and visual disturbances providing there is no large 'startling' component.

It is noted that the proposed development site is located within a heavily urbanized/industrial area and is subject to noise disturbance and light pollution from neighboring residential areas, overflying aircraft from Dublin Airport (located approximately 2km northeast) and a large road network. During the construction stage, there may be short-term increases in noise and disturbance, however this will not be significant in the context of existing noise and disturbance levels. During the operational phase of the proposed development, there will be increased traffic to and from the site.

While the loudest construction activity is likely to be audible at the nearest receptors (i.e. dwellings etc), noise levels will be lower than identified criteria and will be temporary. There will be extended periods when little or no emissions arise and no vibration impacts will arise. During the operational stage noise levels will comply with EPA criteria at all offsite receptors. Impacts will be imperceptible throughout. However, birds which use this area are already subject to disturbance from existing industrial and residential developments and are likely to be habituated to a considerable level disturbance.

Therefore, given the distance from European sites, the existing noise environment and the largely industrial lands in the vicinity, the proposed development will not result in any impacts from noise and disturbance to SCI species and therefore there will be no impact on the conservation objectives for South Dublin Bay and River Tolka Estuary SPA, Malahide Estuary SPA North Bull Island SPA, Baldoyle Bay SPA and Rogerstown Estuary SPA.

8.3 Potential impacts on water quality runoff during construction

During construction there are potential sources of pollution from excavation and drainage from the site resulting from runoff and erosion from site earthworks and temporary stockpiles. The presence of fuels, lubricants and other chemicals from construction activities also have the potential to temporarily affect the surface/ground water regime of the area if not managed properly.

The identified potential effects on surface water during the construction phase are:

- Silt-laden stormwater run-off during site preparation, site clearance, dewatering of excavations and construction of site access roads;
- Washing of construction vehicles and equipment may pose a pollution risk to watercourses in the area if undertaken in inappropriate locations. Spillages of fuel and oil and concrete / cement run-off are a potential short term significant negative effect, from the use of vehicles and plant on the construction sites;
- Silt laden run-off from the storage of excavated material could occur;
- Risk that spills/leaks could result in stormwater becoming contaminated with suspended solids or hydrocarbons;
- Removal of surfacing (hardcore/topsoil) and temporary stockpiling of contaminated soils which could facilitate the mobilisation of contamination in the soil and
- Temporary storage of hazardous substances associated with the operation of plant

In theory, changes in pH which are associated with cement runoff to local watercourses have the potential to cause localised die off among invertebrate communities within the mud complexes downstream and an associated change in the community distribution within the North Dublin Bay SAC. This could potentially impact on the community distribution of mudflat and sandflat habitat within this SAC.

Mudflats and sandflats provide key foraging habitat for large numbers of birds within South Dublin Bay and River Tolka Estuary SPA, Malahide Estuary SPA North Bull Island SPA, Baldoyle Bay SPA, Rogerstown Estuary SPA. A degradation in water quality caused by the runoff of hydrocarbons, cement or other chemical can also affect fish, plant life and

macroinvertebrates by altering pH levels of the water. This could potentially impact on the intensity of use of areas of foraging habitat by SCI birds.

Inadvertent spillages of hydrocarbon and/or other chemical substances can introduce toxic chemicals into the aquatic environment via surface water run-off or groundwater contamination. Aquatic plant communities may also be affected by increased siltation. Submerged plants may be stunted and photosynthesis may be reduced. Significant impacts on fish stocks or invertebrate prey could potentially impact the foraging range and intensity for SCI species.

It is noted that environmental control measures will be implemented during construction in line with standard guidelines (i.e., *Control of Water Pollution from Construction Sites 2001*, and *Control of Water Pollution from Linear Construction Projects 2006* for best practice measures for controlling water pollution)). Whilst the implementation of such measures during construction will assist in minimising impacts on the local environment, the implementation of these measures has not been taken into consideration in this screening report when reaching a conclusion as to the likely impact of the development on European sites.

The potential for significant hydrocarbon spills during construction is very low in the context of modern construction methodologies. In the unlikely event of a minor hydrocarbon spill (and given the groundwater infiltration rates at the site), minor runoff would be largely absorbed to groundwater onsite or within the surrounding grasslands. In the event of such runoff leaving the site, the absence of surface water receptors means there is no direct pathway for this runoff to Dublin Bay (and its associated Natura 2000 sites). In the highly unlikely event that small amounts of hydrocarbons were to reach watercourses 1.5km from the proposed development site, this would dissipate within the 7.8km local surface water network before reaching Dublin Bay. Given the above, there is no significant pathway for impact on water quality within Dublin Bay from construction runoff at the proposed development and there would be no significant impact on the conservation objectives of North Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA and the North Bull Island SPA.

8.4 Potential impacts on water quality during operation

Details of the proposed surface water management are included in **Section 3.4** above. A range of SuDs measures have been incorporated into the project design including permeable paving, rainwater harvesting and underground storage/soakaways. These have been designed following site investigation to confirm that infiltration rates would support these measures. These measures mean that there will be no surface water discharges from the proposed development during operation.

Stages 1 and 2 of the flood risk assessment of proposed site have indicated that the site is not subject to flooding in low, medium or high probability exceedance events up to 0.1% AEP (1 in 1000 chance in any given year) with 20% climate change factor applied from pluvial, fluvial, coastal or groundwater sources. The proposed site is located within Flood Zone C and is defined as a Less Vulnerable Development as per OPW The Planning System and Floor Risk Management. Therefore, the site is appropriate for proposed development, is not at the risk of flooding, will not obstruct or impede important flow paths, exacerbate flooding in the immediate vicinity or wider area and will not result in residual risk to the area.

There are no surface watercourses within the proposed development site and Abbottstown Stream and Bachelor's Stream are located 1.5km and 1.6km respectively from the site. Therefore, there is no direct pathway for surface water runoff to the River Tolka. Given the distances involved, there are no viable pathways to European sites from groundwater passing beneath the proposed development site.

Given SuDS measures detailed above, the distance from surface water receptors and the absence of groundwater pathways, the proposed development will not have a significant impact on the conservation objectives of South Dublin Bay and River Tolka Estuary SPA, Malahide Estuary SPA North Bull Island SPA, Baldoyle Bay SPA, Rogerstown Estuary SPA and North Dublin Bay SAC as a result of surface water runoff during operation.

8.5 Potential Impacts from Wastewater

Once constructed all wastewater from the proposed development will be conveyed for treatment to Ringsend WWTP. The predicted wastewater discharge will be 60 population equivalent (P.E) plus occasional run-off from the contingency external storage area. Further detail on the proposed wastewater discharges is included in **Section 3.5** above. As detailed above, the proposed development will be connected to the foul sewer and no onsite treatment or storage of foul waste is required.

Any existing or proposed projects discharging to the plant have the potential to act cumulatively to reduce water quality in Dublin Bay, affecting European sites therein.

The 2022 AER for Ringsend WWTP notes the following:

- The Ringsend WWTP was non-compliant with the ELV's set in the wastewater discharge licence as detailed in *Section 2.1.2*.
- The primary discharge from the wastewater treatment plant does have an observable negative impact on the water quality in the near field of the discharge and in the Liffey and Tolka Estuaries.
- The primary discharge from the WWTP does not have an observable negative impact on the Water Framework Directive status in the Liffey Estuary.
- Other potential causes of deterioration in water quality relevant to this area are upstream riverine pollutants, combined sewer overflows, exfiltration from sewers and misconnections to surface water sewers in the large urban agglomeration.

The 2022 AER also notes that the overall Upgrade Project works are expected to take until the end of 2025 to complete. The final works to upgrade WWTP to a capacity of 2.4m PE.

Based on the above, and given the small level of discharge proposed, no effect on water quality or on the qualifying interests and conservation objectives for European sites will occur due to water discharges during construction or operation.

8.6 Municipal Solid Waste

The non-recyclable household and commercial waste will be off loaded in the section of the MRF fitted with an odour control system (MSW Bay). It will be inspected and unsuitable materials removed and brought to a quarantine area. The materials will then be processed to

separate the recoverables (paper, plastic, metals) from the non-recoverable materials (including small particles of organic matter).

The metals will be sent to authorised metal recycling facilities. The organic matter will be sent to authorised composting plants. The paper and plastics that are too contaminated to be recycled are suitable for use in production of solid recovered fuel (SRF) which is used in cement kilns as a replacement for fossil fuels. The residual materials, which contains some organic matter, is suitable for use as a refuse derived fuel (RDF) in waste to energy plants.

The operators of the Irish cement kilns and waste to energy plants require the alternative fuels to be delivered loose; however the kilns and plants regularly close down for maintenance and when this occurs the alternative fuel will be compacted and wrapped to form bales which will be temporarily stored inside the building. If there is a major breakdown at one of the kilns/waste to energy plants as a contingency measure the bales will be stored externally until the plants come back into service.

Given the above and the absence of direct hydrological connections to aquatic receptors, there is no potential for municipal solid waste, or the storage of waste materials onsite to adversely impact Natura 2000 sites.

8.7 Spread of Invasive Species

No high-risk invasive species were recorded within the proposed works area. Therefore, no impact on the qualifying interests and conservation objectives for European sites from the spread of invasive species will occur.

8.8 In-combination Impacts

In-combination impacts refer to a series of individually modest impacts that may in combination produce a significant impact. The underlying intention of this in-combination provision is to take account of in-combination impacts from existing or proposed plans and projects and these will often only occur over time.

The main threats to the conservation significance of the South Dublin Bay and River Tolka Estuary SPA, Malahide Estuary SPA North Bull Island SPA, Baldoyle Bay SPA, Rogerstown Estuary SPA and North Dublin Bay SAC, come from urbanised areas/human habitation, reclamation of the land from sea/estuary/marsh, industrial or commercial areas, roads and motorways, discharges, eutrophication from natural sources, recreational activities such as nautical sports, leisure fishing and bait digging/collection and from walking, horse-riding and use of non-motorised vehicles. As Dublin Bay is adjacent to a major urban centre and a major industrial centre, water quality is variable. However, the polluted conditions may not be having significant impacts on the bird populations. Oil pollution from shipping in Dublin Bay is a general threat. Recreational activities are high in some areas of the harbour, including jet skiing which causes disturbance to roosting birds. Climate change is also a significant factor underlying changes in trends in wintering waterbirds in Ireland. Other developments near site and potential in-combination impacts are identified in **Table 12**. In the absence of any significant impacts on qualifying interests or conservation objectives associated with this project, no significant in-combination impacts have been identified.

South Dublin Bay and River Tolka Estuary SPA, Malahide Estuary SPA North Bull Island SPA, Baldoyle Bay SPA, Rogerstown Estuary SPA and North Dublin Bay SAC has been assessed. Potential in-combination impacts on the site may arise owing to an alteration to water quality. Deterioration in water quality can occur as an indirect consequence of point source or diffuse pollution, which in turn changes the aquatic environment and reduces its capacity to support certain plants and animals. This leads to potential negative consequences for the qualifying interests that rely on the maintenance of water quality within the Natura 2000 site.

In the absence of any significant potential impacts on the qualifying interests and conservation interests for the South Dublin Bay and River Tolka Estuary SPA, Malahide Estuary SPA North Bull Island SPA, Baldoyle Bay SPA, Rogerstown Estuary SPA and North Dublin Bay SAC and in the absence of significant impacts on its overall integrity, no potential in-combination impacts from the proposed works have been identified.

Table 12. Potential in-combination impacts

Plans and Projects	Key Policies/Issues/Objectives/Developments Directly Related to the Conservation of the Natura 2000 Network	Impact
River Basin Management Plan 2022-2027	<p>The project should comply with the environmental objectives of the Irish RBMP which are to be achieved generally by 2027.</p> <p>Ensure full compliance with relevant EU legislation</p> <p>Prevent deterioration</p> <p>Meeting the objectives for designated protected areas</p> <p>Protect high status waters</p> <p>Implement targeted actions and pilot schemes in focus sub-catchments aimed at: targeting water bodies close to meeting their objective and addressing more complex issues which will build knowledge for the third cycle.</p>	<p>The implementation and compliance with key environmental policies, issues and objectives of this management plan will result in positive in-combination effects to European sites. The implementation of this plan will have a positive impact for the biodiversity.</p> <p>It will not contribute to in-combination or cumulative impacts with the proposed development on Natura 2000 sites.</p>
Inland Fisheries Ireland Corporate Plan 2021-2025	<p>To ensure that Ireland's fish populations are managed and protected to ensure their conservation status remains favourable. That they provide a basis for a sustainable world class recreational angling product, and that pristine aquatic habitats are also enjoyed for other recreational uses.</p> <p>To develop and improve fish habitats and ensure that the conditions required for fish populations to thrive are sustained and protected.</p>	<p>The implementation and compliance with key environmental issues and objectives of this corporate plan will result in positive on-combination effects to European sites. The implementation of this corporate plan will have a positive impact for biodiversity of inland fisheries and ecosystems. It will not contribute to in-combination or cumulative impacts with the proposed works on Natura 2000 sites.</p>

Plans and Projects	Key Policies/Issues/Objectives/Developments Directly Related to the Conservation of the Natura 2000 Network	Impact
	<p>To grow the number of anglers and ensure the needs of IFI's other key stakeholders are being met in a sustainable conservation focused manner.</p> <p>EU (Quality of Salmonid Waters) Regulations 1988. All works during development and operation of the project must aim to conserve fish and other species of fauna and flora habitat; biodiversity of inland fisheries and ecosystems and protect spawning salmon and trout.</p>	
Irish Water Capital Investment Plan 2020-2024	Proposals to upgrade and secure water services and water treatment services countrywide.	<p>Likely net positive impact due to water conservation and more effective treatment of water.</p> <p>It will not contribute to in-combination or cumulative impacts with the proposed works on Natura 2000 sites.</p>
Water Services Strategic Plan (WSSP, 2015)	<p>Irish Water has prepared a Water Services Strategic Plan (WSSP, 2015), under Section 33 of the Water Service No. 2 Act of 2013 to address the delivery of strategic objectives which will contribute towards improved water quality and biodiversity requirements through reducing:</p> <p>Habitat loss and disturbance from new / upgraded infrastructure;</p> <p>Species disturbance;</p> <p>Changes to water quality or quantity; and</p> <p>Nutrient enrichment /eutrophication.</p>	<p>The WSSP forms the highest tier of asset management plans (Tier 1) which Irish Water prepare and it sets the overarching framework for subsequent detailed implementation plans (Tier 2) and water services projects (Tier 3). The WSSP sets out the challenges we face as a country in relation to the provision of water services and identifies strategic national priorities. It includes Irish Water's short, medium and long-term objectives and identifies strategies to achieve these objectives. As such, the plan provides the context for subsequent detailed implementation plans (Tier 2) which will document the approach to be used for key water service areas such as water resource management, wastewater compliance and sludge management. The WSSP also sets out the strategic objectives against which the Irish Water Capital Investment Programme is developed. The current version of the CAP outlines the proposals for capital expenditure in terms of upgrades and new builds within the Irish Water owned assets.</p>

Plans and Projects	Key Policies/Issues/Objectives/Developments Directly Related to the Conservation of the Natura 2000 Network	Impact
		The overarching strategy was subject to AA and highlighted the need for additional plan/project environmental assessments to be carried out at the tier 2 and tier 3 level. Therefore, no likely significant in-combination effects on Natura 2000 sites are envisaged.
WWTP discharges	Ringsend WWTP, Swords WWTP, Malahide WWTP	Discharges from municipal WWTPs are required to meet water quality standards. The resultant effects of improvements in waste water treatment is a net positive and there is no potential for in combination effects on Natura 2000 sites.
IPC/IEL Facilities	<p>There are a number of Industrial Emissions Licence (IEL) and Integrated Pollution Control (IPC) licenced facilities in the vicinity of the proposed development site. These include;</p> <p>Huntstown Bioenergy Limited (P0993), Huntstown Power Company Limited (P0483), Energia Power Generation Limited (P0777), Starrus Eco Holdings Limited (Millennium Business Park) (W0183), Lagan Materials Limited (P0081), Starrus Eco Holdings Limited (Cappagh) (W0261)</p>	Discharges from these facilities are governed by strict meeting water quality standards. The long-term likely zone of impact impact is predicted to be negligible and there is no potential for in combination effects on Natura 2000 sites.
Fingal County Council Development Plan	<p>The proposed development site is located within the Blanchardstown area of the Fingal Development Plan (2017-2023). This area is zones for Heavy Industry. The Fingal Development Plan lists the following objective with regards to heavy industry.</p> <p>Objective: Provide for heavy industry.</p> <p><i>Vision: Facilitate opportunities for industrial uses, activities and processes which may give rise to land use conflict if located within other zonings. Such uses, activities and processes would be likely to produce adverse impacts, for example by way of noise, dust or visual impacts. HI areas provide suitable and accessible locations specifically for heavy industry and shall be reserved solely for such uses.</i></p>	Future developments will only be granted permission where discharges from same meet with relevant water quality standards. No long-term likely zone of impact is predicted to occur and there is no potential for in combination effects on Natura 2000 sites.

Plans and Projects	Key Policies/Issues/Objectives/Developments Directly Related to the Conservation of the Natura 2000 Network	Impact
Other developments	<p>FW22A/0258. Planning granted 14th March 2023</p> <p>Located approximate 150m north and 200m west of proposed development site. The development comprises the construction and operation of 3 no weighbridges (each with a dedicated weighbridge office), a new 2,160m² soil waste inspection and quarantine shed, new site offices and associated parking facilities. The development will facilitate internal re-routing of soil intake for future backfilling and restoration of Huntstown South Quarry (previously approved under planning permission Ref. FW12A/0022).</p> <p>FW22A/0213. Planning granted 14th March 2023</p> <p>Located approximately 100m east of proposed development site The development is within a total site area of up to c. 1 ha. to include 1 no. DSO (Distribution System Operator) electrical substation building. 1 no. customer switchgear, electrical inverter / transformer station modules. 40 no. containerised battery storage units on concrete support structures, heating, ventilation and air conditioning units (HVAC units), access tracks and upgraded site entrance, underground cabling route c. 1.45 km to existing ESB 220kV Finglas Electricity Substation, associated electrical cabling and ducting, security gates, palisade perimeter security fencing, CCTV security monitoring system and landscaping works and all associated ancillary site infrastructure.</p> <p>FW21A/0151. Application under appeal</p> <p>Located approximately 120m north of proposed development site • Demolition of 2 no. existing residential dwellings and ancillary structures to the east of the site (c.344qm total floor area);</p> <ul style="list-style-type: none"> • Construction of 2 no. data hall buildings (Buildings A and B) comprising data hall rooms, mechanical and electrical galleries, ancillary offices including meeting rooms, workshop spaces, staff areas including break rooms, toilets, shower/changing facilities, storage areas, lobbies, outdoor staff areas, loading bays and docks, associated plant throughout, photovoltaic panels and screened plant areas at roof levels, circulation areas and stair and lift cores throughout; 	<p>In the absence of any significant potential impacts on the qualifying interests and conservation interests for the South Dublin Bay and River Tolka Estuary SPA, Malahide Estuary SPA North Bull Island SPA, Baldoyle Bay SPA, Rogerstown Estuary SPA and North Dublin Bay SAC and in the absence of significant impacts on its overall integrity, no potential in-combination impacts from the proposed works have been identified.</p>

Plans and Projects	Key Policies/Issues/Objectives/Developments Directly Related to the Conservation of the Natura 2000 Network	Impact
	<ul style="list-style-type: none"> • External plant and 58 no. emergency generators located within a generator yard to the east and west of Buildings A and B at ground level. The area is enclosed by a c.6.5m high louvred screen wall; • The proposed data halls (Buildings A and B) are arranged over 3 storeys with a gross floor area of c.37,647sqm each; • The overall height of the data hall buildings is c28m to roof parapet level and c32m including roof plant, roof vents and flues. The total height of Buildings A and B does not exceed 112m OD (above sea level); • The proposed development includes the provision of a temporary substation (c.32sqm), water treatment building (c. 369sqm and c.7.7m high), 7 no. water storage tanks (2,800m3 in total and c.6.4m high each), 2 no. sprinkler tanks (c.670m3 each and c.7.9m high each) with 2 no. pump houses each (c.40sqm and c. 6m high each); • The total gross floor area of the data halls and ancillary structures is c.75,775sqm; • All associated site development works, services provision, drainage upgrade works, 2 no. attenuation basins, landscaping and berming (c.6m high), boundary treatment works and security fencing up to c.2.4m high, new vehicular entrance from the North Road, secondary access to the south west of the site from the existing private road, all internal access roads, security gates, pedestrian/cyclist routes, lighting, 2 no. bin stores, 2 no. bicycle stores serving 48 no. bicycle spaces, 208 no. parking spaces including 10 no. accessible spaces, 20 no. electric vehicle charging spaces and 8 no. motorcycle spaces; • Existing electricity overhead lines traversing the site will be undergrounded under concurrent application Ref. FW21A/0144; • A proposed 220kv substation located to the south west of this site will be subject of a separate Strategic Infrastructure Development application to An Bord Pleanála under section 182A of the Planning and Development Act 2000 (as amended). 	

9. Screening conclusion and statement

This report in support of AA screening has been prepared to assess whether the proposed development, individually or in-combination with other plans or projects, and in view of best scientific knowledge, is likely to have a significant effect on any European site(s).

The screening exercise was completed in compliance with the relevant European Commission guidance, national guidance, and case law. The potential impacts of the proposed development have been considered in the context of the European sites potentially affected, their qualifying interests or special conservation interests, and their conservation objectives.

Through an assessment of the source-pathway-receptor model, which considered the Zol of effects from the proposed development and the potential in-combination effects with other plans or projects, the following findings were reported:

- The proposed development at Huntstown and Coldwinters, Dublin, either alone or in-combination with other plans and/or projects, does not have the potential to significantly affect any European Site, in light of their conservation objectives.

Therefore, a Stage 2 Appropriate Assessment is deemed not to be required.

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Appendices

Appendix 1 Site synopses

SITE NAME: SOUTH DUBLIN BAY AND RIVER TOLKA ESTUARY SPA SITE CODE: 004024

The South Dublin Bay and River Tolka Estuary SPA comprises a substantial part of Dublin Bay. It includes the intertidal area between the River Liffey and Dun Laoghaire, and the estuary of the River Tolka to the north of the River Liffey, as well as Booterstown Marsh. A portion of the shallow marine waters of the bay is also included.

In the south bay, the intertidal flats extend for almost 3 km at their widest. The sediments are predominantly well-aerated sands. Several permanent channels exist, the largest being Cockle Lake. A small sandy beach occurs at Merrion Gates, while some bedrock shore occurs near Dun Laoghaire. The landward boundary is now almost entirely artificially embanked. There is a bed of Dwarf Eelgrass (*Zostera noltii*) below Merrion Gates which is the largest stand on the east coast. Green algae (*Ulva* spp.) are distributed throughout the area at a low density. The macro- invertebrate fauna is well-developed, and is characterised by annelids such as Lugworm (*Arenicola marina*), Nephthys spp. and Sand Mason (*Lanice conchilega*), and bivalves, especially Cockle (*Cerastoderma edule*) and Baltic Tellin (*Macoma balthica*). The small gastropod Spire Shell (*Hydrobia ulvae*) occurs on the muddy sands off Merrion Gates, along with the crustacean *Corophium volutator*. Sediments in the Tolka Estuary vary from soft thixotropic muds with a high organic content in the inner estuary to exposed, well-aerated sands off the Bull Wall. The site includes Booterstown Marsh, an enclosed area of saltmarsh and muds that is cut off from the sea by the Dublin/Wexford railway line, being linked only by a channel to the east, the Nutley stream. Sea water incursions into the marsh occur along this stream at high tide. An area of grassland at Poolbeg, north of Irishtown Nature Park, is also included in the site.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Light-bellied Brent Goose, Oystercatcher, Ringed Plover, Grey Plover, Knot, Sanderling, Dunlin, Bar-tailed Godwit, Redshank, Black-headed Gull, Roseate Tern, Common Tern and Arctic Tern. The E.U. Birds Directive pays particular attention to wetlands, and as these form part of the SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

The site is an important site for wintering waterfowl, being an integral part of the internationally important Dublin Bay complex – all counts for wintering waterbirds are five year mean peaks for the period 1995/96 to 1999/2000. Although birds regularly commute between the south bay and the north bay, recent studies have shown that certain populations which occur in the south bay spend most of their time there. An internationally important population of Light-bellied Brent Goose (368) occurs regularly and newly arrived birds in the autumn feed on the Eelgrass bed at Merrion. At the time of designation the site supported nationally important numbers of a further nine species: Oystercatcher (1,145), Ringed Plover (161), Grey Plover (45), Knot (548), Sanderling (321), Dunlin (1,923), Bar-tailed Godwit (766), Redshank (260) and Black-headed Gull (3,040). Other species occurring in smaller numbers include Great Crested Grebe (21), Curlew (127) and Turnstone (52). Little Egret, a species which has recently colonised Ireland, also occurs at this site.

South Dublin Bay is a significant site for wintering gulls, with a nationally important population of Black-headed Gull, but also Common Gull (330) and Herring Gull (348). Mediterranean Gull is also recorded from here, occurring through much of the year, but especially in late winter/spring and again in late summer into winter.

Both Common Tern and Arctic Tern breed in Dublin Docks, on a man-made mooring structure known as the E.S.B. dolphin – this is included within the site. Small numbers of Common Tern and Arctic Tern were recorded nesting on this dolphin in the 1980s. A survey in 1995 recorded nationally important numbers of Common Tern nesting here (52 pairs). The breeding population of Common Tern at this site has increased, with 216 pairs recorded in 2000. This increase was largely due to the ongoing management of the site for breeding terns. More recent data highlights this site as one of the most important Common Tern sites in the country with over 400 pairs recorded here in 2007.

South Dublin Bay is an important staging/passage site for a number of tern species in the autumn (mostly late July to September). The origin of many of the birds is likely to be the Dublin breeding sites (Rockabill and the

Dublin Docks) though numbers suggest that the site is also used by birds from other sites, perhaps outside the state. This site is selected for designation for its autumn tern populations: Roseate Tern (2,000 in 1999), Common Tern (5,000 in 1999) and Arctic Tern (20,000 in 1996).

The South Dublin Bay and River Tolka Estuary SPA is of ornithological importance as it supports an internationally important population of Light-bellied Brent Goose and nationally important populations of a further nine wintering species.

Furthermore, the site supports a nationally important colony of breeding Common Tern and is an internationally important passage/staging site for three tern species. It is of note that four of the species that regularly occur at this site are listed on Annex I of the E.U. Birds Directive, i.e. Bar-tailed Godwit, Common Tern, Arctic Tern and Roseate Tern. Sandymount Strand/Tolka Estuary is also a Ramsar Convention site.

SITE NAME: MALAHIDE ESTUARY SPA SITE CODE: 004025

Malahide Estuary is situated in north Co. Dublin, between the towns of Malahide and Swords. The site encompasses the estuary, saltmarsh habitats and shallow subtidal areas at the mouth of the estuary. A railway viaduct, built in the 1800s, crosses the site and has led to the inner estuary becoming lagoonal in character and only partly tidal. Much of the outer part of the estuary is well-sheltered from the sea by a large sand spit, known as "The Island". This spit is now mostly converted to golf-course. The outer part empties almost completely at low tide and there are extensive intertidal flats exposed. Substantial stands of eelgrass (both *Zostera noltii* and *Z. angustifolia*) occur in the sheltered part of the outer estuary, along with Tasselweed (*Ruppia maritima*). Green algae, mostly *Ulva* spp., are frequent on the sheltered flats. Common Cord-grass (*Spartina anglica*) is well established in the outer estuary and also in the innermost part of the site. The intertidal flats support a typical macro- invertebrate fauna, with polychaete worms (*Arenicola marina* and *Hediste diversicolor*), bivalves such as *Cerastoderma edule*, *Macoma balthica* and *Scrobicularia plana*, the small gastropod *Hydrobia ulvae* and the crustacean *Corophium volutator*. Salt marshes, which provide important roosts during high tide, occur in parts of the outer estuary and in the extreme inner part of the inner estuary. These are characterised by such species as Sea Purslane (*Halimione portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Sea Arrowgrass (*Triglochin maritima*) and Common Saltmarsh-grass (*Puccinellia maritima*).

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Great Crested Grebe, Light-bellied Brent Goose, Shelduck, Pintail, Goldeneye, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Knot, Dunlin, Black-tailed Godwit, Bar-tailed Godwit and Redshank. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

This site is of high importance for wintering waterfowl and supports a particularly good diversity of species. It has internationally important populations of Light-bellied Brent Goose (1,104 individuals or 5% of the all-Ireland total) and Black-tailed Godwit (409 individuals or 2.9% of the all-Ireland total) - figures given here and below are mean peaks for the five winters 1995/96-1999/2000. Furthermore, the site supports nationally important populations of an additional 12 species: Great Crested Grebe (63), Shelduck (439), Pintail (58), Goldeneye (215), Red-breasted Merganser (99), Oystercatcher (1,360), Golden Plover (1,843), Grey Plover (201), Knot (915), Dunlin (1,594), Bar-tailed Godwit (156) and Redshank (581). The high numbers of diving ducks reflects the lagoon-type nature of the inner estuary, and this is one of the few sites in eastern Ireland where substantial numbers of Goldeneye can be found.

A range of other species occurs, including Mute Swan (37), Pochard (36), Ringed Plover (86), Lapwing (1,542), Curlew (548), Greenshank (38) and Turnstone (112).

The estuary also attracts other migrant wader species such as Ruff, Curlew Sandpiper, Spotted Redshank and Little Stint. These occur mainly in autumn, though occasionally in spring and winter.

Breeding birds of the site include Ringed Plover, Shelduck and Mallard. Up to the 1950s there was a major tern colony at the southern end of Malahide Island. Grey Herons breed nearby and feed regularly within the site.

Malahide Estuary SPA is a fine example of an estuarine system, providing both feeding and roosting areas for a range of wintering waterfowl. The lagoonal nature of the inner estuary is of particular value as it increases the

diversity of birds which occur. The site is of high conservation importance, with internationally important populations of Light-bellied Brent Goose and Black-tailed Godwit, and nationally important populations of a further 12 species. Two of the species which occur regularly (Golden Plover and Bar-tailed Godwit) are listed on Annex I of the E.U. Birds Directive. Malahide Estuary (also known as Broadmeadow Estuary) is a Ramsar Convention site.

SITE NAME: NORTH BULL ISLAND SPA SITE CODE: 004006

This site covers all of the inner part of north Dublin Bay, with the seaward boundary extending from the Bull Wall lighthouse across to Drumleck Point at Howth Head. The North Bull Island sand spit is a relatively recent depositional feature, formed as a result of improvements to Dublin Port during the 18th and 19th centuries. It is almost 5 km long and 1 km wide and runs parallel to the coast between Clontarf and Sutton. Part of the interior of the island has been converted to golf courses.

Saltmarsh extends along the length of the landward side of the island and provides the main roost site for wintering birds in Dublin Bay. The island shelters two intertidal lagoons which are divided by a solid causeway. These lagoons provide the main feeding grounds for the wintering waterfowl. The sediments of the lagoons are mainly sands with a small and varying mixture of silt and clay. Green algal mats (*Ulva* spp.) are a feature of the flats during summer. These sediments have a rich macro-invertebrate fauna, with high densities of Lugworm (*Arenicola marina*) and Ragworm (*Hediste diversicolor*).

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Light-bellied Brent Goose, Shelduck, Teal, Pintail, Shoveler, Oystercatcher, Golden Plover, Grey Plover, Knot, Sanderling, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Turnstone and Black-headed Gull. The site is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

The North Bull Island SPA is of international importance for waterfowl on the basis that it regularly supports in excess of 20,000 waterfowl. The site supports internationally important populations of three species, Light-bellied Brent Goose (1,548), Black-tailed Godwit (367) and Bar-tailed Godwit (1,529) - all figures are mean peaks for the five winters between 1995/96 and 1999/2000. The site is one of the most important in the country for Light-bellied Brent Goose. A further 14 species have populations of national importance – Shelduck (1,259), Teal (953), Pintail (233), Shoveler (141), Oystercatcher (1,784), Grey Plover (517), Golden Plover (2,033), Knot (2,837), Sanderling (141), Dunlin (4,146), Curlew (937), Redshank (1,431), Turnstone (157) and Black-headed Gull (2,196). The populations of Pintail and Knot are of particular note as they comprise 14% and 10% respectively of the all-Ireland population totals. Other species that occur regularly in winter include Grey Heron, Little Egret, Cormorant, Wigeon, Goldeneye, Red-breasted Merganser, Ringed Plover and Greenshank. Gulls are a feature of the site during winter and, along with the nationally important population of Black-headed Gull (2,196), other species that occur include Common Gull (332) and Herring Gull (331). While some of the birds also frequent South Dublin Bay and the River Tolka Estuary for feeding and/or roosting purposes, the majority remain within the site for much of the winter. The wintering bird populations have been monitored more or less continuously since the late 1960s and the site is now surveyed each winter as part of the larger Dublin Bay complex.

The North Bull Island SPA is a regular site for passage waders, especially Ruff, Curlew Sandpiper and Spotted Redshank. These are mostly observed in single figures in autumn but occasionally in spring or winter.

The site formerly had an important colony of Little Tern but breeding has not occurred in recent years. Several pairs of Ringed Plover breed, along with Shelduck in some years. Breeding passerines include Skylark, Meadow Pipit, Stonechat and Reed Bunting. The island is a regular wintering site for Short-eared Owl, with up to 5 present in some winters.

The North Bull Island SPA is an excellent example of an estuarine complex and is one of the top sites in Ireland for wintering waterfowl. It is of international importance on account of both the total number of waterfowl and the individual populations of Light-bellied Brent Goose, Black-tailed Godwit and Bar-tailed Godwit that use it.

Also of significance is the regular presence of several species that are listed on Annex I of the E.U. Birds Directive, notably Golden Plover and Bar-tailed Godwit, but also Ruff and Short-eared Owl. North Bull Island is a Ramsar Convention site, and part of the North Bull Island SPA is a Statutory Nature Reserve and a Wildfowl Sanctuary.

SITE NAME: BALDOYLE BAY SPA SITE CODE: 004016

Baldoyle Bay, located to the north and east of Baldoyle and to the south of Portmarnock, Co. Dublin, is a relatively small, narrow estuary separated from the open sea by a large sand dune system. Two small rivers, the Mayne River and the Sluice River, flow into the inner part of the estuary.

Large areas of intertidal flats are exposed at low tide. These are mostly sands but grade to muds in the inner sheltered parts of the estuary. Extensive areas of Common Cord-grass (*Spartina anglica*) occur in the inner estuary. Both the Narrow-leaved Eelgrass (*Zostera angustifolia*) and the Dwarf Eelgrass (*Z. noltii*) are also found here. During summer, the sandflats of the sheltered areas are covered by mats of green algae (*Ulva* spp.). The sediments have a typical macrofauna, with Lugworm (*Arenicola marina*) dominating the sandy flats. Areas of saltmarsh occur near Portmarnock Bridge and at Portmarnock Point, with narrow strips found along other parts of the estuary. Species such as Glasswort (*Salicornia* spp.), Sea-purslane (*Halimione portulacoides*), Sea Plantain (*Plantago maritima*) and Sea Rush (*Juncus maritimus*) are found here.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Light-bellied Brent Goose, Shelduck, Ringed Plover, Golden Plover, Grey Plover and Bar-tailed Godwit. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Baldoyle Bay is an important site for wintering waterfowl, providing good quality feeding areas and roost sites for an excellent diversity of waterfowl species. It supports an internationally important population of Light-bellied Brent Goose (726), and has a further five species with nationally important populations (all figures are mean peaks for the five winters 1995/96 to 1999/2000): Shelduck (147), Ringed Plover (223), Golden Plover (2,120), Grey Plover (200) and Bar-tailed Godwit (353). Other species which occur include Great Crested Grebe (42), Pintail (35), Teal (138), Mallard (46), Common Scoter (61), Oystercatcher (531), Lapwing (524), Knot (189), Dunlin (879), Black-tailed Godwit (113), Curlew (98), Redshank (224), Greenshank (11) and Turnstone (43).

Regular breeding birds include Shelduck, Mallard and Ringed Plover. In autumn, passage migrants such as Curlew Sandpiper, Spotted Redshank and Green Sandpiper are regular in small numbers. Little Egret, a species which has recently colonised Ireland, also occurs at this site.

Baldoyle Bay SPA is of high conservation importance, for supporting internationally important numbers of Light-bellied Brent Goose as well as nationally important populations of a further five species, including Golden Plover and Bar-tailed Godwit, both species that are listed on Annex I of the E.U. Birds Directive. The inner part of the site is a Statutory Nature Reserve and also designated as a wetland of international importance under the Ramsar Convention.

SITE NAME: ROGERSTOWN ESTUARY SPA SITE CODE: 004015

Rogerstown Estuary is situated about 2 km north of Donabate in north County Dublin. It is a relatively small, funnel shaped estuary separated from the sea by a sand and shingle peninsula; the site extends eastwards to include an area of shallow marine water. The estuary receives the waters of the Ballyboghil and Ballough rivers and has a wide salinity range, from near full seawater to near full freshwater. The estuary is divided by a causeway and narrow bridge, built in the 1840s to carry the Dublin- Belfast railway line. At low tide extensive intertidal sand and mud flats are exposed and these provide the main food resource for the wintering waterfowl that use the site. The intertidal flats of the estuary are mainly of sands, with soft muds in the north- west sector and along the southern shore. Associated with these muds are stands of Common Cord-grass (*Spartina anglica*). Green algae (mainly *Ulva* spp.) are widespread and form dense mats in the more sheltered areas. The intertidal vascular plant Beaked Tasselweed (*Ruppia maritima*) grows profusely in places beneath the algal mats and is

grazed by herbivorous waterfowl (notably Light-bellied Brent Goose and Wigeon). Salt marsh fringes parts of the estuary, especially its southern shores. Common plant species of the saltmarsh include Sea Rush (*Juncus maritimus*), Sea Purslane (*Halimione portulacoides*) and Common Saltmarsh-grass (*Puccinellia maritima*).

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Greylag Goose, Light-bellied Brent Goose, Shelduck, Shoveler, Oystercatcher, Ringed Plover, Grey Plover, Knot, Dunlin, Black-tailed Godwit and Redshank. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Rogerstown Estuary is an important winter waterfowl site and supports a population of Light-bellied Brent Goose of international importance (1,069) - all counts are mean peaks over the five winters 1995/96 – 1999/2000. A further 10 species have populations of national importance as follows: Greylag Goose (160), Shelduck (773), Shoveler (59), Oystercatcher (1,345), Ringed Plover (188), Grey Plover (229), Knot (2,454), Dunlin (2,745), Black-tailed Godwit (195) and Redshank (490). The Greylag Geese are part of a larger population which spends most of the winter on Lambay Island. Other species which occur regularly include Wigeon (358), Teal (346), Mallard (214), Red-breasted Merganser (30), Golden Plover (1,059) Lapwing (2,129), Sanderling (50), Curlew (505) and Turnstone (77). Large numbers of gulls including Herring Gull, Great Black-backed Gull and Black-headed Gull are attracted to the area, partly due to the presence of an adjacent local authority landfill site. Little Egret, a species which has recently colonised Ireland, also occurs at this site.

Some of the wader species also occur on passage, notably Black-tailed Godwit with numbers often exceeding 300 in April. The estuary is a regular staging post for scarce migrants, especially in autumn when Green Sandpiper, Ruff, Little Stint, Curlew Sandpiper and Spotted Redshank may be seen. Shelduck breed within the site.

Rogerstown Estuary SPA is an important link in the chain of estuaries on the east coast. It supports an internationally important population of Light-bellied Brent Goose and nationally important populations of a further 10 species. The presence of Little Egret and Golden Plover is of note as these species are listed on Annex I of the E.U. Birds Directive. Rogerstown Estuary is also a Ramsar Convention site, and part of Rogerstown Estuary SPA is designated as a Statutory Nature Reserve and a Wildfowl Sanctuary.

Site Name: North Dublin Bay SAC Site Code: 000206

This site covers the inner part of north Dublin Bay, the seaward boundary extending from the Bull Wall lighthouse across to the Martello Tower at Howth Head. The North Bull Island is the focal point of this site.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

- [1140] Tidal Mudflats and Sandflats
- [1210] Annual Vegetation of Drift Lines
- [1310] Salicornia Mud
- [1330] Atlantic Salt Meadows
- [1410] Mediterranean Salt Meadows
- [2110] Embryonic Shifting Dunes
- [2120] Marram Dunes (White Dunes)
- [2130] Fixed Dunes (Grey Dunes)*
- [2190] Humid Dune Slacks
- [1395] Petalwort (*Petalophyllum ralfsii*)

North Bull Island is a sandy spit which formed after the building of the South Wall and Bull Wall in the 18th and 19th centuries. It now extends for about 5 km in length and is up to 1 km wide in places. A well-developed and dynamic dune system stretches along the seaward side of the island. Various types of dunes occur, from fixed dune grassland to pioneer communities on foredunes. Marram Grass (*Ammophila arenaria*) is dominant on the outer dune ridges, with Lyme-grass (*Leymus arenarius*) and Sand Couch (*Elymus farctus*) on the foredunes. Behind the first dune ridge, plant diversity increases with the appearance of such species as Wild Pansy (*Viola*

tricolor), Kidney Vetch (*Anthyllis vulneraria*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Common Restharrow (*Ononis repens*), Yellow-rattle (*Rhinanthus minor*) and Pyramidal Orchid (*Anacamptis pyramidalis*). In these grassy areas and slacks, the scarce Bee Orchid (*Ophrys apifera*) occurs.

About 1 km from the tip of the island, a large dune slack with a rich flora occurs, usually referred to as the 'Alder Marsh' because of the presence of Alder trees (*Alnus glutinosa*). The water table is very near the surface and is only slightly brackish. Saltmarsh Rush (*Juncus maritimus*) is the dominant species, with Meadowsweet (*Filipendula ulmaria*) and Devil's-bit Scabious (*Succisa pratensis*) being frequent. The orchid flora is notable and includes Marsh Helleborine (*Epipactis palustris*), Common Twayblade (*Listera ovata*), Autumn Lady's-tresses (*Spiranthes spiralis*) and Marsh Orchids (*Dactylorhiza* spp.).

Saltmarsh extends along the length of the landward side of the island. The edge of the marsh is marked by an eroding edge which varies from 20 cm to 60 cm high. The marsh can be zoned into different levels according to the vegetation types present. On the lower marsh, Glasswort (*Salicornia europaea*), Common Saltmarsh-grass (*Puccinellia maritima*), Annual Sea-blite (*Suaeda maritima*) and Greater Sea-spurrey (*Spergularia media*) are the main species. Higher up in the middle marsh Sea Plantain (*Plantago maritima*), Sea Aster (*Aster tripolium*), Sea Arrowgrass (*Triglochin maritima*) and Thrift (*Armeria maritima*) appear. Above the mark of the normal high tide, species such as Common Scurvygrass (*Cochlearia officinalis*) and Sea Milkwort (*Glaux maritima*) are found, while on the extreme upper marsh, the rushes *Juncus maritimus* and *J. gerardi* are dominant. Towards the tip of the island, the saltmarsh grades naturally into fixed dune vegetation.

The habitat 'annual vegetation of drift lines' is found in places, along the length of Dollymount Strand, with species such as Sea Rocket (*Cakile maritima*), Oraches (*Atriplex* spp.) and Prickly Saltwort (*Salsola kali*).

The island shelters two intertidal lagoons which are divided by a solid causeway. The sediments of the lagoons are mainly sands with a small and varying mixture of silt and clay. The north lagoon has an area known as the "Salicornia flat", which is dominated by *Salicornia dolichostachya*, a pioneer glasswort species, and covers about 25 ha. Beaked Tasselweed (*Ruppia maritima*) occurs in this area, along with some Narrow-leaved Eelgrass (*Zostera angustifolia*). Dwarf Eelgrass (*Z. noltii*) also occurs in Sutton Creek. Common Cordgrass (*Spartina anglica*) occurs in places but its growth is controlled by management. Green algal mats (*Enteromorpha* spp., *Ulva lactuca*) cover large areas of the flats during summer. These sediments have a rich macrofauna, with high densities of Lugworms (*Arenicola marina*) in parts of the north lagoon. Mussels (*Mytilus edulis*) occur in places, along with bivalves such as *Cerastoderma edule*, *Macoma balthica* and *Scrobicularia plana*. The small gastropod *Hydrobia ulvae* occurs in high densities in places, while the crustaceans *Corophium volutator* and *Carcinus maenas* are common. The sediments on the seaward side of North Bull Island are mostly sands. The site extends below the low spring tide mark to include an area of the sublittoral zone.

Three rare plant species which are legally protected under the Flora (Protection) Order, 1999 have been recorded on the North Bull Island. These are Lesser Centaury (*Centaurium pulchellum*), Red Hemp-nettle (*Galeopsis angustifolia*) and Meadow Saxifrage (*Saxifraga granulata*). Two further species listed as threatened in the Red Data Book, Wild Clary/Sage (*Salvia verbenaca*) and Spring Vetch (*Vicia lathyroides*), have also been recorded. A rare liverwort, *Petalophyllum ralfsii*, was first recorded from the North Bull Island in 1874 and has recently been confirmed as still present. This species is of high conservation value as it is listed on Annex II of the E.U. Habitats Directive. The North Bull is the only known extant site for the species in Ireland away from the western seaboard.

North Dublin Bay is of international importance for waterfowl. During the 1994/95 to 1996/97 period the following species occurred in internationally important numbers (figures are average maxima): Brent Goose 2,333; Knot 4,423; Bar-tailed Godwit 1,586. A further 14 species occurred in nationally important concentrations - Shelduck 1505; Wigeon 1,166; Teal 1,512; Pintail 334; Shoveler 239; Oystercatcher 2,190; Ringed Plover 346; Grey Plover 816; Sanderling 357; Dunlin 6,238; Black-tailed Godwit 156; Curlew 1,193; Turnstone 197 and Redshank 1,175. Some of these species frequent South Dublin Bay and the River Tolka Estuary for feeding and/or roosting purposes (mostly Brent Goose, Oystercatcher, Ringed Plover, Sanderling and Dunlin).

The tip of the North Bull Island is a traditional nesting site for Little Tern. A high total of 88 pairs nested in 1987. However, nesting attempts have not been successful since the early 1990s. Ringed Plover, Shelduck, Mallard, Skylark, Meadow Pipit and Stonechat also nest. A well-known population of Irish Hare is resident on the island

The invertebrates of the North Bull Island have been studied and the island has been shown to contain at least seven species of regional or national importance in Ireland (from the Orders Diptera, Hymenoptera and Hemiptera).

The main land uses of this site are amenity activities and nature conservation. The North Bull Island is the main recreational beach in Co. Dublin and is used throughout the year. Much of the land surface of the island is taken up by two golf courses. Two separate Statutory Nature Reserves cover much of the island east of the Bull Wall and the surrounding intertidal flats. The site is used regularly for educational purposes. North Bull Island has been designated a Special Protection Area under the E.U. Birds Directive and it is also a statutory Wildfowl Sanctuary, a Ramsar Convention site, a Biogenetic Reserve, a Biosphere Reserve and a Special Area Amenity Order site.

This site is an excellent example of a coastal site with all the main habitats represented. The site holds good examples of nine habitats that are listed on Annex I of the E.U. Habitats Directive; one of these is listed with priority status. Several of the wintering bird species have populations of international importance, while some of the invertebrates are of national importance. The site contains a numbers of rare and scarce plants including some which are legally protected. Its proximity to the capital city makes North Dublin Bay an excellent site for educational studies and research.



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**Proposed Development at the
Huntstown Economic Hub, Co. Fingal
for Rathdrinagh Land ULC**

**Engineering Report
(Planning Application)**

Made: MJ

Checked:..... PC

Approved:..... PC

Revision	Description	Made	Checked	Approved	Date
A (Final)	Planning	MJ	PC	PC	08/2023

**Proposed Industrial Units
at Huntstown Circular Economic Hub,
Huntstown, Fingal, Co Dublin**

Engineering Report (Planning Application)

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4. WATER SUPPLY

This section describes the existing water supply in the vicinity of the site and summarises the proposed watermain infrastructure required to serve the proposed development.

4.1 Proposed Water Supply

The site will be served by new 150mm HDPE water supply ring main. The connection is proposed to be provided from the existing public road, as per the layout in Appendix A via the existing 150mm uPVC watermain. All watermain infrastructure has been designed in accordance with the Irish Water code of Practice.

Refer to Appendix A for the proposed Foul and Surface Water Drainage Layout and for Watermain Layout drawing.

5. FOUL DRAINAGE

It is proposed to provide new separate surface and foul drainage systems to serve the proposed development. This section describes the existing foul drainage services on or near the site and summarises the additional foul drainage infrastructure required to serve the proposed development.

5.1 Existing Foul Drainage

The nearest available connection to the public foul sewer is located to the North Rd, to the east of the site, it is noted that the foul sewage connection point sits outside the site boundaries.

The existing site is not serviced by foul sewage infrastructure.

5.2 Proposed Foul Drainage

The foul sewer branch pipes conveying the effluent from the development to the main foul drainage system will generally consist of 300mm dia pipes. Given the available gradient to the outfall point a 300mm diameter pipe is required to achieve an adequate self cleansing velocity.

The proposed Irish Water Greater Dublin Orbital Sewer route passes through the site as per Appendix F. A consultation meeting was held with Irish Water on the 13th December 2022 where agreement for the proposed warehouse development was provided in principle.

Refer to Appendix A for the proposed Foul and Surface Water Drainage Layout and for Watermain Layout drawing.

5.2.1 Hydraulic & Organic Loading

Daily foul discharge has been estimated based on the proposed development use in accordance with the EPA and Irish Water guidelines.

The projected total wastewater discharge is as shown in Table 5.1 below:

Total Population	l/person/day	l/day	BOD (g/day per person)	Organic Loading (g/day BOD5)
60	60	3600	25	1500

Table 5.1 - Water Supply, Hydraulic and Organic Loading

Max Design Flow:

= 1500 litres per day.

Assuming 6 times dry weather flow (DWF), the peak hydraulic discharge arising from this development is: 0.42 l/second.

The pipe network has been designed to ensure that sufficient hydraulic capacity and cleansing velocities are achieved, in accordance with Irish Water Code of Practice.

Max Organic Load:

=2.5kg (BOD₅)/day.

Population Equivalent Value:

= 60 P.E.

All foul drainage will be constructed in accordance with Greater Dublin Region Code of Practice for Drainage Works and Irish Water requirements.

6. SURFACE WATER DRAINAGE

It is proposed to provide new separate surface and foul drainage systems to serve the proposed development.

This section outlines the existing surface water drainage services onsite and gives our proposals for the additional surface water drainage requirements as part of the development.

6.1 Existing Surface Water Drainage

The existing site generally drains from east to west, all surface water is dissipated through natural infiltration. There is no natural outfall to the site.

Refer to Appendix A for the proposed Foul and Surface Water Drainage Layout and for Watermain Layout drawing.

6.2 Proposed Surface Water Drainage

The surface storm water design consists of the following components.

- SuD's infiltration soakaway with storage capacity.
- Permeable paving to carpark areas
- Rainwater harvesting to building roofs

It is proposed to harvest the rainwater from the building roofs allowing for attenuation of up to 10,000 litres per industrial unit for further use. As such 2no separate surface water drainage systems have been proposed to separate rainwater from the roof and to collect it in the rainwater harvesting tank. A separate surface water system for trafficked hardstand areas and all ground surface rainwater runoff has been proposed and to be discharged through a by-pass petrol interceptor (Klargester). All rainwater from the site will be stored and infiltrated at site, there is therefore no outfall from the site and the as such the controlled flow rate is 0.0 litres per second per hectare (0l/s/ha).

A BRE 365 infiltration test was carried out as part of the site investigation to the site, details of the infiltration rate can be found in Appendix H.

In order to comply with Fingal CoCo Development Plan requirements, it is necessary to include a SuDS based storm water management system in accordance with the Greater Dublin Strategic Drainage Strategy. The above listed SuD's design items are included through the following;

1. Permeable paving to all car parking areas to allow for self infiltration to the subsoil. Given the turning of heavy duty HGV's it is not possible to provide permeable paving to all hardstand areas.
2. Rainwater harvesting is provided to all roof water in the form of underground rain harvesting butts. The retained water will be used for general washing and vehicle washing.
3. The installation of an underground storage cell with subsoil infiltration (soakaway). The drainage from the hardstand yard areas will be directed to a petrol/oil interceptor and in turn to the storage cell to allow for infiltration to the subsoil.

The surface water drainage system has been designed to ensure adequate capacity is achieved with a minimum self-cleansing velocity in the pipes when flowing half full.

It is noted the previous planning application ref FW20A/0063 made reference to an open swale. Open swales or retention ponds are not a viable means of SuDs for this site. Open swales and ponds attract bird life and the proximity of the site to Dublin Airport would increase the risk to aircraft from increased bird number. This above is addressed further in the Aviation Consultants report accompanying the application.

Refer to Appendix A for the proposed Foul and Surface Water Drainage Layout and for Watermain Layout drawing.

All surface water drainage shall be constructed in accordance with Greater Dublin Region Code of Practice for Drainage Works

7. SUMMARY

- Separate foul and surface water drainage systems will be constructed to serve the site.
- Separate surface water system to collect and harvest water from the roofs for re-use has been proposed.
- Sustainable Drainage Systems designed for the proposed development include: permeable paving to staff car park, rainwater harvesting system, storage and infiltration (soakaway) system.

APPENDIX A PROPOSED DRAINAGE & WATERMAIN DRAWING

- ⊙(AV) On-line Air Valve as per STD-W-22
- ⊙(SV) Sluice Valve as per STD-W-15
- ⊙(WH) Washout Hydrant as per STD-W-30A with Scour Chamber as per STD-W-30B
- ⊙(H) Off-line Hydrant as per STD-W-19
- ⊙(WM) Electromagnetic Meter chamber as per STD-W-26

NOTES:-
 This is a planning drawing only and is therefore limited in its capacity to convey the total information, details & specification necessary to complete the works. Any work carried out that is not covered here will be the responsibility of the persons carrying them out. If any situation arises which would cause a contravention of the building regulations, then the Engineer should be consulted, otherwise the Engineer cannot be held responsible. As these drawings are prepared as planning drawings only, it is strongly recommended that the Engineer be consulted for the preparation of full working drawings. It is solely the clients responsibility to appoint a Qualified Engineer to supervise the project during the construction stage and to prepare structural working drawings for the builder.

OVERGROUND ALL WORK AND MATERIALS ARE TO BE IN ACCORDANCE WITH THE CURRENT BUILDING REGULATIONS WHETHER DETAILED ON THIS DRAWING OR NOT.

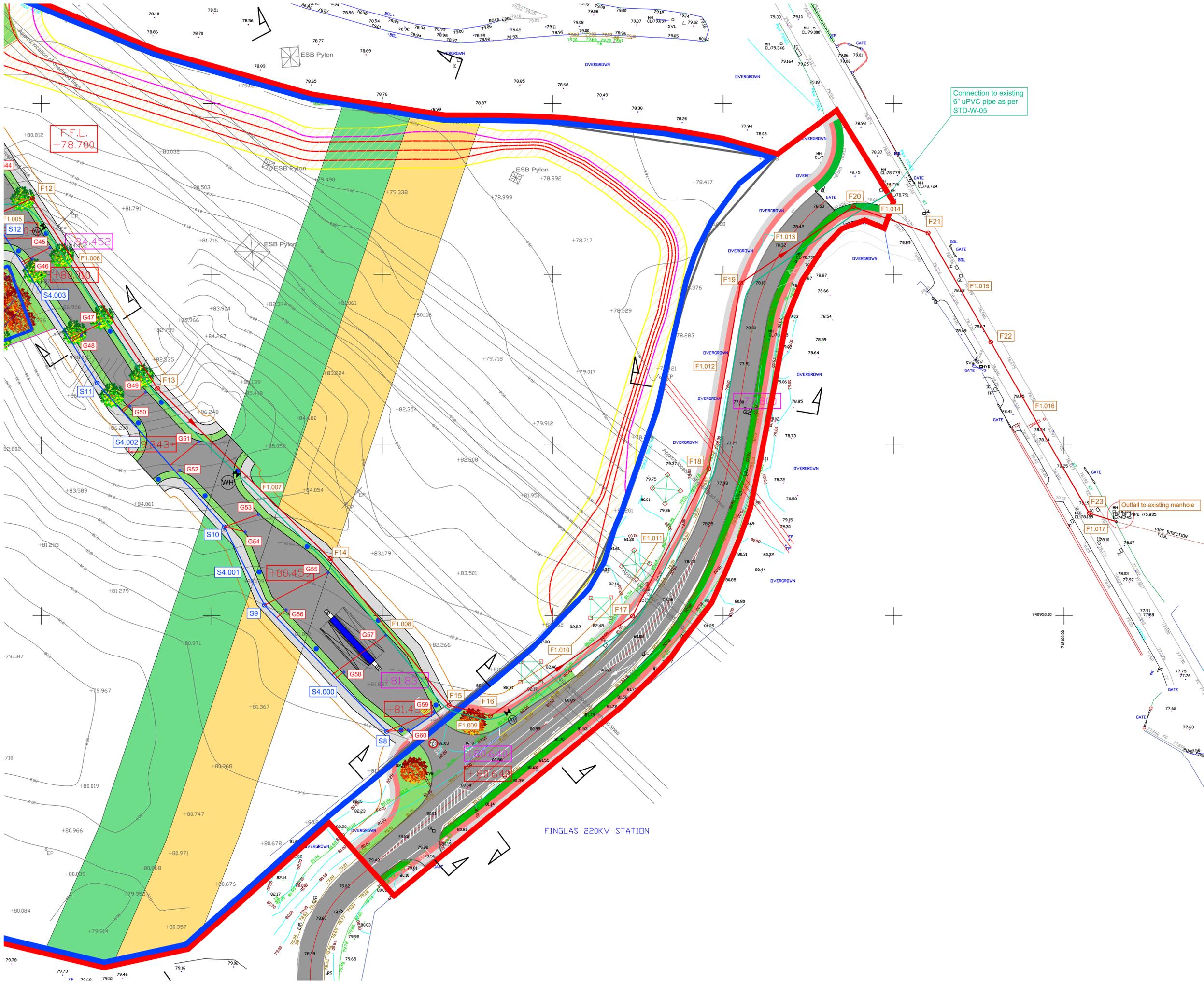
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Project:			
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Client:			
Rathdrinagh Land ULC T/A Irish Recycling			
Sheet Title:			
Drainage & Watermain Layout - Sheet 1			
Project No.:	22-039	Date:	07-03-23
Drawing No.:	C-100	Scale:	As shown
Rev:		Checked:	PC



NOTES:-
 This is a planning drawing only and is therefore limited in its capacity to convey the total information, details & specification necessary to complete the works. Any work carried out that is not covered here will be the responsibility of the persons carrying them out. If any situation arises which would cause a contravention of the building regulations, then the Engineer should be consulted, otherwise the Engineer cannot be held responsible. As these drawings are prepared as planning drawings only, it is strongly recommended that the Engineer be consulted for the preparation of full working drawings. It is solely the clients responsibility to appoint a Qualified Engineer to supervise the project during the construction stage and to prepare structural working drawings for the builder.
 ALL WORK AND MATERIALS ARE TO BE IN ACCORDANCE WITH THE CURRENT BUILDING REGULATIONS WHETHER DETAILED ON THIS DRAWING OR NOT.
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Project:			
Huntstown Circular Economy Hub Huntstown/Coldwinters, Fingal, Co Dublin			
Client:			
Rathdrinagh Land ULC T/A Irish Recycling			
Sheet Title:		Drainage & Watermain Layout - Sheet 2	
Project No.:	22-039	Date:	07-03-23
Drawing No.:	C-101	Scale:	As shown.
Rev:		Checked:	PC

HCEH

Document Ref: HCEH Drainage schedule (S3 P1) (1)

Project: HCEH
 Zone: -
 Description: Surface Drainage
 Network: As shown
 Area: -

Schedule Rev.: P1
 Drawing Ref.: P0
 (including rev.) -

	Issued;	Checked;	Approved;
Name	MJ	MJ	PC
Date	01/03/2023	01/03/2023	01/03/2023

Network	Pipe Details								Upstream					Downstream				Notes	
	Pipe Ref.	Length (m)	Gradient (1:xxx)	Full Bore Vel (m/s)	Internal Dia. (mm)	Pipe Capacity (l/s)	Flow (l/s)	Bedding Type	Chamber Ref.	Chamber Type	Cover Type	Pipe Invert Level (mAOD)	Cover Level (mAOD)	Pipe Cover Depth (m)	Chamber Ref.	Pipe Invert Level (mAOD)	Cover Level (mAOD)		Pipe Cover Depth (m)
Surface Drainage	S1.000	83.838	296.5	0.75	225	30.0	20.8	Type S	S1	Type C	C1	77.175	78.600	1.200	S4	76.892	78.600	1.483	Drainage run to be replaced with Aco drain and connected to manhole S3 if required
	S2.000	49.128	296.0	0.75	225	30.0	29.2	Type Z	S2	Type C	C1	78.430	78.600	-0.055	S3	78.264	78.600	0.111	
	S2.001	46.864	400.3	0.78	300	55.1	49.7	Type S	S3	Type C	C1	78.189	78.600	0.111	S4	78.072	78.600	0.228	
	S1.001	21.882	121.6	1.42	300	100.7	69.0	Type S	S4	Type C	C1	76.817	78.600	1.483	S17	76.637	78.600	1.663	
	S3.000	52.048	296.9	0.75	225	30.0	28.5	Type S	S5	Type C	C1	77.175	78.600	1.200	S6	77.000	78.600	1.375	
	S3.001	56.759	392.8	0.79	300	55.6	55.1	Type S	S6	Type C	C1	76.925	78.600	1.375	S7	76.780	78.600	1.520	
	S3.002	45.702	392.8	0.79	300	55.6	55.1	Type S	S7	Type C	C1	76.780	78.600	1.520	S14	76.664	78.600	1.636	
	S4.000	51.500	51.5	1.41	150	24.8	21.0	Type S	S8	Type C	C1	80.110	81.460	1.200	S9	79.110	80.460	1.200	
	S4.001	25.777	56.0	1.75	225	69.6	27.9	Type S	S9	Type C	C1	79.035	80.460	1.200	S10	78.575	80.000	1.200	
	S4.002	56.270	48.9	1.87	225	74.5	39.6	Type S	S10	Type C	C1	78.575	80.000	1.200	S11	77.425	78.850	1.200	
	S4.003	55.686	385.0	0.80	300	56.2	53.4	Type S	S11	Type C	C1	77.350	78.850	1.200	S12	77.205	80.000	2.495	
	S4.004	59.128	500.0	0.80	375	88.7	61.3	Type S	S12	Type C	C1	77.130	80.000	2.495	S13	77.012	79.200	1.813	
	S4.005	55.125	500.0	0.80	375	88.7	69.5	Type S	S13	Type C	C1	77.012	79.200	1.813	S14	76.902	78.600	1.323	
	S3.003	13.317	500.0	0.90	450	143.5	115.6	Type S	S14	Type C	C1	76.514	78.600	1.636	S17	76.487	78.600	1.663	
	S5.000	76.818	295.5	0.76	225	30.0	27.5	Type Z	S15	Type C	C1	78.240	78.600	0.135	S16	77.980	78.600	0.395	Drainage run to be replaced with Aco drain and connected to manhole S16 if required
	S5.001	2.984	14.7	3.43	225	136.4	27.5	Type S	S16	Type C	C1	77.980	78.600	0.395	S17	77.777	78.600	0.598	
	S1.002	10.439	500.0	0.99	525	215.4	195.1	Type S	S17	Type C	C1	76.412	78.600	1.663	S34	76.391	78.600	1.684	
	S6.000	41.830	98.9	1.01	150	17.9	6.1	Type S	Saj18	Access Junction	C1	77.250	78.600	1.200	Saj19	76.827	78.600	1.623	
	S6.001	18.553	174.6	0.76	150	13.4	11.1	Type S	Saj19	Access Junction	C1	78.827	78.600	1.623	Saj20	76.721	78.600	1.729	
	S6.002	30.000	296.1	0.75	225	30.0	26.2	Type S	Saj20	Access Junction	C1	76.646	78.600	1.729	Saj21	76.544	78.600	1.831	
	S6.003	40.000	426.5	0.76	300	53.4	43.8	Type S	Saj21	Access Junction	C1	76.469	78.600	1.831	Saj24	76.376	78.600	1.924	
	S7.000	41.830	175.3	0.76	150	13.4	11.0	Type S	Saj22	Access Junction	C1	77.250	78.600	1.200	Saj23	77.011	78.600	1.439	
	S7.001	40.000	296.5	0.75	225	30.0	20.6	Type S	Saj23	Access Junction	C1	76.936	78.600	1.439	Saj24	76.802	78.600	1.573	
	S6.004	12.654	500.0	0.80	375	88.7	62.3	Type S	Saj24	Access Junction	C1	76.301	78.600	1.924	Saj32	76.275	78.600	1.950	
	S8.000	41.841	175.1	0.76	150	13.4	12.5	Type S	Saj25	Access Junction	C1	77.250	78.600	1.200	Saj26	77.011	78.600	1.439	
	S8.001	45.574	296.1	0.75	225	30.0	23.5	Type S	Saj26	Access Junction	C1	76.936	78.600	1.439	Saj27	76.782	78.600	1.593	
	S8.002	31.174	426.5	0.76	300	53.4	38.8	Type S	Saj27	Access Junction	C1	76.707	78.600	1.593	Saj30	76.634	78.600	1.666	
	S9.000	41.830	168.2	0.77	150	13.6	13.6	Type S	Saj28	Access Junction	C1	77.250	78.600	1.200	Saj29	77.001	78.600	1.449	
	S9.001	51.805	238.5	0.84	225	33.5	26.0	Type S	Saj29	Type C	C1	76.926	78.600	1.449	Saj30	76.709	78.600	1.666	
	S8.004	54.998	219.0	1.22	375	134.8	62.3	Type S	Saj31	Access Junction	C1	76.526	78.600	1.699	Saj32	76.275	78.600	1.950	
	S6.005	21.668	500.0	0.90	450	143.5	116.4	Type S	Saj32	Access Junction	C1	76.200	78.600	1.950	Saj33	76.157	78.600	1.993	
S6.006	4.714	500.0	0.90	450	143.5	116.4	Type S	Saj33	Access Junction	C1	76.157	78.600	1.993	S34	76.148	78.600	2.002		
S1.003	5.238	500.0	1.08	600	306.0	303.1	Type S	S34	Type C	C1	75.998	78.600	2.002	S Outfall	75.987	78.600	2.013	Outfall to storage and infiltration	
Foul Drainage	F1.000	41.331	241.7	1.01	300	71.2	2.4	Type S	Faj1	Access Junction	C1	78.132	78.600	0.168	F2	77.961	78.600	0.339	
	F2.000	1.480	58.5	1.01	100	7.9	0.0	Type S	S3	Type C	C1	78.187	78.600	0.313	F2	78.161	78.600	0.339	
	F1.001	30.397	241.7	1.01	300	71.2	2.4	Type S	F2	Type C	C1	77.961	78.600	0.339	F3	77.836	78.600	0.464	
	F1.002	21.882	59.0	2.05	300	144.9	4.8	Type S	F3	Type C	C1	77.836	78.600	0.464	F5	77.465	78.600	0.835	
	F3.000	1.694	58.5	1.01	100	7.9	0.0	Type S	S16	Type C	C1	77.981	78.600	0.519	F4	77.952	78.600	0.548	
	F3.001	16.808	58.5	1.01	100	7.9	0.0	Type S	F4	Type C	C1	77.952	78.600	0.548	F5	77.665	78.600	0.835	
	F1.003	45.461	240.8	1.01	300	71.3	4.8	Type S	F5	Type C	C1	77.465	78.600	0.835	F10	77.276	79.100	1.524	
	F4.000	41.382	240.6	1.01	300	71.3	2.4	Type S	Faj6	Access Junction	C1	78.141	78.600	0.159	Faj7	77.969	78.600	0.331	
	F4.001	30.879	111.9	1.49	300	105.0	2.4	Type S	Faj7	Access Junction	C1	77.969	78.600	0.331	Faj8	77.693	78.600	0.607	
	F4.002	33.646	241.1	1.01	300	71.3	2.4	Type S	Faj8	Access Junction	C1	77.693	78.600	0.607	F9	77.553	79.000	1.147	
	F4.003	20.941	75.6	1.81	300	127.9	2.4	Type S	F9	Type C	C1	77.553	79.000	1.147	F10	77.276	79.100	1.524	
	F1.004	42.899	241.1	1.01	300	71.3	7.2	Type S	F10	Type C	C1	77.276	79.100	1.524	F11	77.098	79.500	2.102	
	F1.005	39.504	241.1	1.01	300	71.3	7.2	Type S	F11	Type C	C1	77.098	79.500	2.102	F12	76.934	80.010	2.776	
	F1.006	66.505	241.1	1.01	300	71.3	7.2	Type S	F12	Type C	C1	76.934	80.010	2.776	F13	76.659	79.800	2.841	
	F1.007	71.290	241.1	1.01	300	71.3	7.2	Type S	F13	Type C	C1	76.659	79.800	2.841	F14	76.363	79.720	3.057	
F1.008	55.075	241.1	1.01	300	71.3	7.2	Type S	F14	Type C	C1	76.363	79.720	3.057	F15	76.134	80.640	4.206		
F1.009	12.865	241.1	1.01	300	71.3	7.2	Type S	F15	Type C	C1	76.134	80.640	4.206	F16	76.081	80.640	4.259		
F1.010	50.956	241.1	1.01	300	71.3	7.2	Type S	F16	Type C	C1	76.081	80.640	4.259	F17	75.870	80.000	3.830		
F1.011	48.647	241.1	1.01	300	71.3	7.2	Type S	F17	Type C	C1	75.870	80.000	3.830	F18	75.668	78.000	2.032		
F1.012	55.188	241.1	1.01	300	71.3	7.2	Type S	F18	Type C	C1	75.668	78.000	2.032	F19	75.439	78.200	2.461		
F1.013	39.881	241.1	1.01	300	71.3	7.2	Type S	F19	Type C	C1	75.439	78.200	2.461	F20	75.274	78.450	2.876		
F1.014	23.246	241.1	1.01	300	71.3	7.2	Type S	F20	Type C	C1	75.274	78.450	2.876	F21	75.177	78.750	3.273		

HCEH

Document Ref: HCEH Drainage schedule (S3 P1) (1)

F1.015	36.852	241.1	1.01	300	71.3	7.2	Type S	F21	Type C	C1	75.177	78.750	3.273	F22	75.024	78.670	3.346	
F1.016	57.820	241.1	1.01	300	71.3	7.2	Type S	F22	Type C	C1	75.024	78.670	3.346	F23	74.785	78.180	3.095	
F1.017	8.342	241.1	1.01	300	71.3	7.2	Type S	F23	Type C	C1	74.785	78.180	3.095	F Outfall	74.750	78.155	3.105	Outfall to existing foul network

Notes

1. All covers to new chambers shall be positioned to be opened and the chamber accessed without obstruction. Chamber covers to be orientated to avoid obstructing access where located in close proximity to a safety barrier, where applicable.
2. All man entry chambers shall have access arranged such that the user faces oncoming traffic when entering and exiting.
3. Pipe Cover Depth is distance between finished ground surface level and pipe soffit level.

APPENDIX C INFILTRATION (SOAKAWAY) STORAGE CALCULATION

INPUT		
Total Area to be Drained	24,100	Sq m
Impermeability Factor	0.9	
Storm Return Period	100	Yrs
Allowable Discharge per hectare	0.00	l/s
Time of Concentration	4.00	min
2 Day M5 (mm) =	53.00	mm
Ratio 60 Minute M5/2 Day M5	0.31	
Impermeable Area	21690	Sq m
Allowable Discharge	0.00	Cu m/min
60 Minute M5	16.50	mm
Storage Event	Maximum Event	

SURFACE WATER ATTENUATION & STORAGE

Version 1.04

Storage C = Q*TS - P*(TS + TC) + P^2*TC/Q

$W = LN(1.06 * M5-60/(48*r))$ $Cr = J0 + J1 * (M5-D) + J2 * (M5-D)^2$
 $X = LN(721/(1 + 15 * D))$
 $Y = LN(48 * r/1.06)$ $LN((MT-D)/M5-D) = Cr * (LN(T) - 1.5)$
 $Z = LN(721/16)$
 $LN(M5-D) = LN(D) + W + (X * Y)/Z$

Project No.:	HCEH
Project:	HCEH
Date:	16-Feb-2023
Designer:	MJK

Time of Storm TS Minutes	Time of Storm D Hours	Time of Concentration TC Minutes	W	X	Y	Z	LN(D)	LN(M5-D)	M5-D mm	Rainfall Intensity mm/hr	J0	J1	J2	Cr	M100-D mm	Rainfall Intensity +20% mm/hr	Discharge to Storage l/s	Discharge to Storage Q Cu.m/min	Storage Required C Cu. m
3	0.050	4.0	0.157	6.021	2.646	3.808	-2.996	1.345	3.839	76.787	0.165	0.008	-0.000305	0.192	6.975	167.410	1008.646	60.519	181.56
5	0.083	4.0	0.157	5.770	2.646	3.808	-2.485	1.682	5.374	64.483	0.165	0.008	-0.000305	0.201	10.023	144.335	869.616	52.177	260.88
7	0.117	4.0	0.157	5.569	2.646	3.808	-2.148	1.879	6.544	56.091	0.165	0.008	-0.000305	0.206	12.416	127.712	769.462	46.168	323.17
10	0.167	4.0	0.157	5.328	2.646	3.808	-1.792	2.068	7.906	47.437	0.165	0.008	-0.000305	0.212	15.252	109.817	661.648	39.699	396.99
13	0.217	4.0	0.157	5.134	2.646	3.808	-1.529	2.195	8.981	41.450	0.165	0.008	-0.000305	0.215	17.511	96.983	584.322	35.059	455.77
16	0.267	4.0	0.157	4.971	2.646	3.808	-1.322	2.290	9.873	37.024	0.165	0.008	-0.000305	0.217	19.389	87.250	525.678	31.541	504.65
20	0.333	4.0	0.157	4.789	2.646	3.808	-1.099	2.386	10.873	32.619	0.165	0.008	-0.000305	0.219	21.486	77.349	466.026	27.962	559.23
25	0.417	4.0	0.157	4.600	2.646	3.808	-0.875	2.478	11.916	28.600	0.165	0.008	-0.000305	0.221	23.654	68.123	410.444	24.627	615.67
30	0.500	4.0	0.157	4.441	2.646	3.808	-0.693	2.550	12.803	25.607	0.165	0.008	-0.000305	0.222	25.471	61.129	368.305	22.098	662.95
45	0.750	4.0	0.157	4.075	2.646	3.808	-0.288	2.701	14.898	19.864	0.235	-0.001	-0.000017	0.220	29.462	47.139	284.011	17.041	766.83
60	1.000	4.0	0.157	3.808	2.646	3.808	0.000	2.803	16.500	16.500	0.235	-0.001	-0.000017	0.217	32.417	38.900	234.374	14.062	843.75
75	1.250	4.0	0.157	3.597	2.646	3.808	0.223	2.880	17.818	14.254	0.235	-0.001	-0.000017	0.216	34.811	33.419	201.347	12.081	906.06
90	1.500	4.0	0.157	3.424	2.646	3.808	0.405	2.942	18.948	12.632	0.235	-0.001	-0.000017	0.214	36.838	29.470	177.559	10.654	958.82
105	1.750	4.0	0.157	3.276	2.646	3.808	0.560	2.993	19.945	11.397	0.235	-0.001	-0.000017	0.213	38.603	26.471	159.487	9.569	1004.77
120	2.000	4.0	0.157	3.147	2.646	3.808	0.693	3.037	20.841	10.421	0.235	-0.001	-0.000017	0.211	40.172	24.103	145.223	8.713	1045.61
135	2.250	4.0	0.157	3.032	2.646	3.808	0.811	3.075	21.658	9.626	0.235	-0.001	-0.000017	0.210	41.588	22.180	133.635	8.018	1082.44
150	2.500	4.0	0.157	2.930	2.646	3.808	0.916	3.110	22.411	8.964	0.235	-0.001	-0.000017	0.209	42.879	20.582	124.006	7.440	1116.05
165	2.750	4.0	0.157	2.837	2.646	3.808	1.012	3.140	23.110	8.404	0.235	-0.001	-0.000017	0.208	44.068	19.230	115.858	6.951	1147.00
180	3.000	4.0	0.157	2.752	2.646	3.808	1.099	3.168	23.764	7.921	0.235	-0.001	-0.000017	0.207	45.170	18.068	108.861	6.532	1175.70
240	4.000	4.0	0.157	2.470	2.646	3.808	1.386	3.260	26.043	6.511	0.250	-0.002	0.000012	0.204	48.992	14.698	88.554	5.313	1275.17
300	5.000	4.0	0.157	2.250	2.646	3.808	1.609	3.330	27.942	5.588	0.250	-0.002	0.000012	0.201	52.116	12.508	75.359	4.522	1356.47
360	6.000	4.0	0.157	2.070	2.646	3.808	1.792	3.387	29.586	4.931	0.250	-0.002	0.000012	0.198	54.785	10.957	66.016	3.961	1425.96
420	7.000	4.0	0.157	1.917	2.646	3.808	1.946	3.435	31.045	4.435	0.250	-0.002	0.000012	0.196	57.130	9.794	59.007	3.540	1486.99
480	8.000	4.0	0.157	1.785	2.646	3.808	2.079	3.477	32.362	4.045	0.250	-0.002	0.000012	0.195	59.230	8.884	53.529	3.212	1541.63
540	9.000	4.0	0.157	1.668	2.646	3.808	2.197	3.514	33.568	3.730	0.250	-0.002	0.000012	0.193	61.136	8.151	49.112	2.947	1591.24
600	10.000	4.0	0.157	1.563	2.646	3.808	2.303	3.546	34.683	3.468	0.250	-0.002	0.000012	0.192	62.886	7.546	45.467	2.728	1636.80
660	11.000	4.0	0.157	1.469	2.646	3.808	2.398	3.576	35.721	3.247	0.250	-0.002	0.000012	0.190	64.508	7.037	42.399	2.544	1679.00
720	12.000	4.0	0.157	1.382	2.646	3.808	2.485	3.603	36.695	3.058	0.250	-0.002	0.000012	0.189	66.020	6.602	39.777	2.387	1718.38
780	13.000	4.0	0.157	1.303	2.646	3.808	2.565	3.627	37.613	2.893	0.250	-0.002	0.000012	0.188	67.440	6.225	37.507	2.250	1755.33
840	14.000	4.0	0.157	1.229	2.646	3.808	2.639	3.650	38.483	2.749	0.250	-0.002	0.000012	0.187	68.779	5.895	35.520	2.131	1790.19
900	15.000	4.0	0.157	1.160	2.646	3.808	2.708	3.672	39.311	2.621	0.250	-0.002	0.000012	0.186	70.048	5.604	33.763	2.026	1823.21
960	16.000	4.0	0.157	1.096	2.646	3.808	2.773	3.691	40.100	2.506	0.250	-0.002	0.000012	0.185	71.255	5.344	32.198	1.932	1854.62
1020	17.000	4.0	0.157	1.035	2.646	3.808	2.833	3.710	40.856	2.403	0.250	-0.002	0.000012	0.184	72.406	5.111	30.794	1.848	1884.57
1080	18.000	4.0	0.157	0.979	2.646	3.808	2.890	3.728	41.581	2.310	0.250	-0.002	0.000012	0.183	73.507	4.900	29.525	1.772	1913.24
1140	19.000	4.0	0.157	0.925	2.646	3.808	2.944	3.744	42.279	2.225	0.250	-0.002	0.000012	0.183	74.563	4.709	28.373	1.702	1940.74
1400	23.333	4.0	0.157	0.720	2.646	3.808	3.150	3.807	45.034	1.930	0.250	-0.002	0.000012	0.180	78.713	4.048	24.390	1.463	2048.74
1900	31.667	4.0	0.157	0.415	2.646	3.808	3.455	3.901	49.459	1.562	0.250	-0.002	0.000012	0.176	85.310	3.233	19.478	1.169	2220.45
2200	36.667	4.0	0.157	0.269	2.646	3.808	3.602	3.946	51.732	1.411	0.227	-0.001	0.000003	0.174	88.668	2.902	17.484	1.049	2307.85
2300	38.333	4.0	0.157	0.225	2.646	3.808	3.646	3.960	52.441	1.368	0.227	-0.001	0.000003	0.173	89.711	2.808	16.920	1.015	2335.01

MAXIMUM STORAGE REQUIRED (Cu. M) = 2335.01

APPENDIX D SOAKAWAY STORAGE SYSTEM SPEC SHEETS

AquaCell Eco

Product description

AquaCell Eco is manufactured from specially reformulated, recycled material and has been specifically designed for shallow, non-trafficked, landscaped applications. AquaCell Eco is NOT suitable for locations subject to high water tables.



Technical specification

Product code / SAP code	6LB025 / 4040289	Void ratio	95%
Colour	Black	Material	Recycled PP
Dimensions	1m x 0.5m x 0.4m	Vertical loading	21.3 tonnes/m ² (213 kN/m ²)
Weight	7kg	Lateral loading	5.2 tonnes/m ² (52 kN/m ²)
Storage volume	190 litres	BBA approval	Certificate 03/4018

Maximum installation depths

Typical soil type	Maximum depth of installation – to base of units (m) ¹		
	Soil weight kN/m ³	Angle of internal friction ϕ (degrees) ^{2,3}	Landscaped areas
Over consolidated stiff clay	20	24	1.53
Silty sandy clay	19	26	1.68
Loose sand and gravel	18	30	2.08
Medium dense sand and gravel	19	34	2.35
Dense sand and gravel	20	38	2.68

Minimum cover depths

Landscaped areas	
Minimum cover depth (m)	0.30 ³

1. These values relate to installations where the groundwater is a minimum of one metre below the base of the excavation.

2. AquaCell Eco units should not be used where groundwater is present.

3. 0.5m cover is required where a ride-on mower may be used.

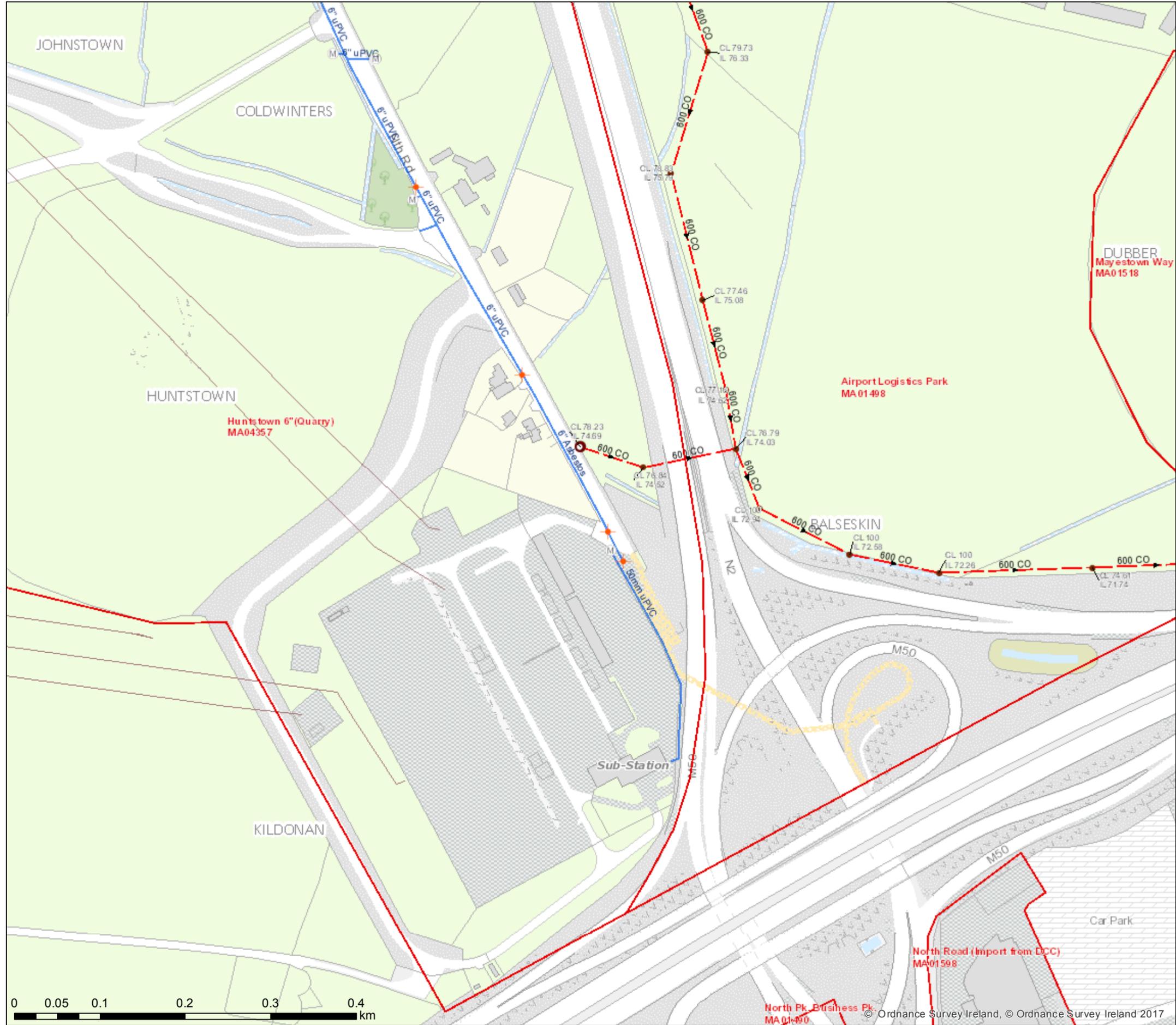
Assumptions made:

- Ground surface is horizontal
- Shear planes or other weaknesses are not present within the structure of the soil

Source: BBA

**APPENDIX E
EXISTING WATERMAIN LAYOUT
(IRISH WATER)**

Baleskin, North Road



UISCE
EIREANN : IRISH
WATER

Print Date: 18/08/2022

Printed by: Irish Water

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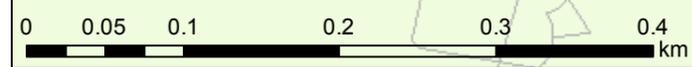
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NOTE: DIAL BEFORE YOU DIG Phone: 1850 427 747 or e-mail dig@gasnetworks.ie - The actual position of the gas/electricity distribution and transmission network must be verified on site before any mechanical excavating takes place. If any mechanical excavation is proposed, hard copy maps must be requested from GNI re gas. All work in the vicinity of gas distribution and transmission network must be completed in accordance with the current edition of the Health & Safety Authority publication, 'Code of Practice For Avoiding Danger From Underground Services' which is available from the Health and Safety Authority (1890 28 93 89) or can be downloaded free of charge at www.hsa.ie.

Water Distribution Network	Sewer Foul Combined Network	Storm Water Network
Water Treatment Plant	Waste Water Treatment Plant	Surface Gravity Mains
Water Pump Station	Waste Water Pump station	Surface Gravity Mains Private
Storage Cell/Tower	Sewer Mains Irish Water	Surface Water Pressurised Mains
Dosing Cell	Gravity - Combined	Surface Water Pressurised Mains Private
Meter Station	Gravity - Foul	Inlet Type
Abstraction Point	Gravity - Unknown	Gully
Telemetry Kiosk	Pumping - Combined	Standard
Reservoir	Pumping - Foul	Other: Unknown
Potable	Pumping - Unknown	Storm Manholes
Raw Water	Syphon - Combined	Standard
Water Distribution Mains	Syphon - Foul	Backdrop
Irish Water	Overflow	Cascade
Private	Sewer Mains Private	Catchpit
Trunk Water Mains	Gravity - Combined	Bifurcation
Irish Water	Gravity - Foul	Hatchbox
Private	Gravity - Unknown	Lampole
Water Lateral Lines	Pumping - Combined	Hydrobrake
Irish Water	Pumping - Foul	Other: Unknown
Private	Syphon - Unknown	Storm Culverts
Non IW	Syphon - Combined	Storm Clean Outs
Water Casings	Syphon - Foul	Stormwater Chambers
Water Abandoned Lines	Overflow	Discharge Type
Boundary Meter	Sewer Lateral Lines	Outfall
Bulk/Check Meter	Sewer Casings	Overflow
Group Scheme	Sewer Manholes	Soakaway
Source Meter	Standard	Other; Unknown
Waste Meter	Backdrop	Gas Networks Ireland
Unknown Meter; Other Meter	Cascade	Transmission High Pressure Gasline
Non-Return	Catchpit	Distribution Medium Pressure Gasline
PRV	Bifurcation	Distribution Low Pressure Gasline
PSV	Hatchbox	ESB Networks
Sluice Line Valve Open/Closed	Lampole	ESB HV Lines
Butterfly Line Valve Open/Closed	Hydrobrake	HV Underground
Sluice Boundary Valve Open/Closed	Other; Unknown	HV Overhead
Butterfly Boundary Valve Open/Closed	Discharge Type	HV Abandoned
Scour Valves	Outfall	ESB MVLV Lines
Single Air Control Valve	Overflow	MV Overhead Three Phase
Double Air Control Valve	Soakaway	MV Overhead Single Phase
Water Stop Valves	Standard Outlet	LV Overhead Three Phase
Water Service Connections	Other; Unknown	LV Overhead Single Phase
Water Distribution Chambers	Cleanout Type	MVLV Underground
Water Network Junctions	Rodding Eye	Abandoned
Pressure Monitoring Point	Flushing Structure	Non Service Categories
Fire Hydrant	Other; Unknown	Proposed
Fire Hydrant/Washout	Sewer Inlets	Under Construction
Water Fittings	Catchpit	Out of Service
Cap	Gully	Decommissioned
Reducer	Standard	Water Non Service Assets
Tap	Other; Unknown	Water Point Feature
Other Fittings	Sewer Fittings	Water Pipe
	Vent/Col	Water Structure
	Other; Unknown	Waste Non Service Assets
		Waste Point Feature
		Sewer
		Waste Structure



APPENDIX F

IRISH WATER GREATER DUBLIN ORBITAL SEWER

APPENDIX G IRISH WATER CORRESPONDENCE

FW: Greater Dublin Drainage Project IW/10001369/WL/11a Landowner:- Rathdrinagh Land Ltd.

Paul McCarthy <paul.mccarthy@sretaw.ie>

23 March 2023 at 08:13

To: Peter Coyle <peter@coylecs.ie>

Cc: Jim O'Callaghan <jim@ocallaghanmoran.com>, Ronan Woods <ronan@genesisplanning.co.uk>, Andrew Bunbury <andrewbunbury@parkhood.com>, O'Dwyer & Jones - Aviation Planning <admin@aviationplanning.ie>, "jkeenan@trafficwise.ie" <jkeenan@trafficwise.ie>

Hi all,

Please see below response from Irish Water.

Kind regards

Paul

From: John Donoghue (Wayleaves) <John.Donoghue@water.ie>

Sent: Wednesday 22 March 2023, 16:25

To: Paul McCarthy <paul.mccarthy@sretaw.ie>

Cc: Monika Prokop <monika.prokop@water.ie>

Subject: RE: Greater Dublin Drainage Project IW/10001369/WL/11a Landowner:- Rathdrinagh Land Ltd.

Paul

Thank you for your email below and for forwarding the Site Plan, Service Drawings including the proposed Drainage & Watermain Layout Drawing,

Our Project Management Team ('PMT') have reviewed the service drawings provided and have the following **observations:**

- Foul sewer manhole 14 is just inside the permeant wayleave, can this be relocated outside the corridor? (Including suitable separation distance for any concrete surround)
- Watermain layout shows a valve and washout hydrant in the temporary working area, can this be relocated outside the corridor? (Including suitable separation distance for any concrete surround/ thrust blocks)
- Can the surface water layout be revisited to minimise impacts on the permanent wayleave/ TWA? - If it is not possible to remove gullies and road crossings from the corridor perhaps they could be relocated and realigned to minimise future impacts on GDD constructability?
- Public lighting, is there scope to move the lamp standards out of the permanent wayleave?

In terms of the other queries (as addressed below) our PMT are satisfied that these are sufficiently covered off now, such that Uisce Éireann can make a favourable observation should a planning application be submitted.

Kind regards

John

John Donoghue

Valuation Lead - Major Projects

APPENDIX H BRE 365 TEST RESULTS

Project No. 22-125
 Site Huntstown
 Test Location Per 01 Glacial Till
 width (m) length (m)

Full analysis not possible using method as described in BRE Digest 365/CIRIA Report

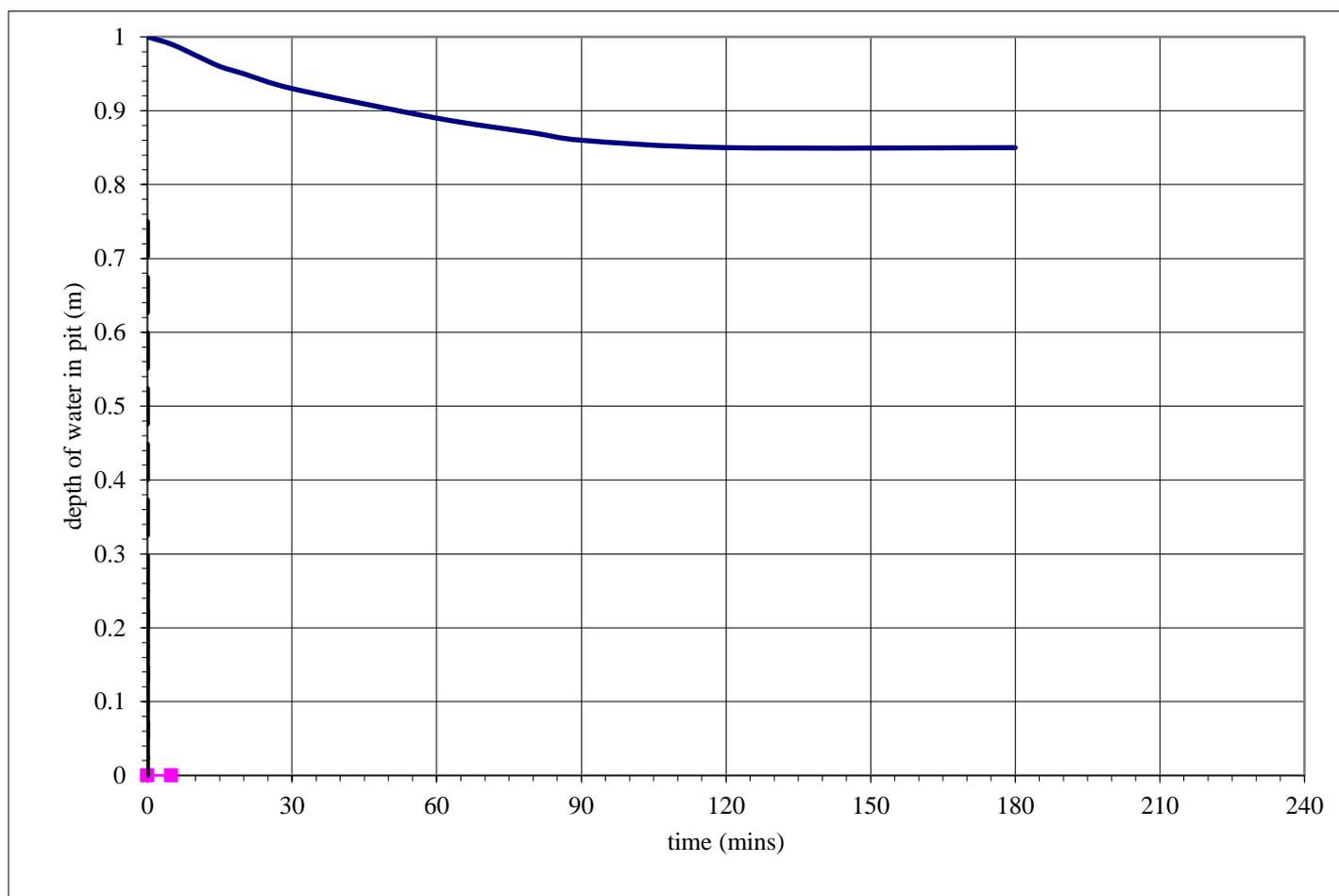
test pit top dimensions 0.4 1.2 test infiltration rate (q) = ##### m/h
 test pit base dimensions 0.4 1.2 depth to groundwater before adding water = Dry
 test pit depth 1 m depth to water surface at start of test 0 m

time (mins)	depth to water surface (m)	depth of water in pit (m)	time elapsed from test start (mins)	volume of water lost from test start (m3)	Area of walls and base at 50% drop from test start (m2)	q from start of test (m/min)	q from start of test (m/h)
0	0	1	0	0	3.68		
5	0.01	0.99	5	0.0048	3.664		
10	0.025	0.975	10	0.012	3.64		
15	0.04	0.96	15	0.0192	3.616		
20	0.05	0.95	20	0.024	3.6		
30	0.07	0.93	30	0.0336	3.568		
60	0.11	0.89	60	0.0528	3.504		
80	0.13	0.87	80	0.0624	3.472		
90	0.14	0.86	90	0.0672	3.456		
120	0.15	0.85	120	0.072	3.44		
180	0.15	0.85	180	0.072	3.44		

From graph:

test start - 75% depth at 0.75 m water depth
 time is - minutes
 test end - 25% depth at 0.25 m water depth
 time is - minutes

-	0.25	0.75	#VALUE!	0	2.8800		
-	0.75	0.25	#VALUE!	0.2400	2.0800	#####	#VALUE!





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