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PROPOSED MAINTENANCE BUILDING: BALLEALLY LANDFILL/ROGERSTOWN PARK SITE, LUSK, CO. DUBLIN

SITE SPECIFIC FLOOD RISK ASSESSMENT

Prepared for: Fingal County Council

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Council



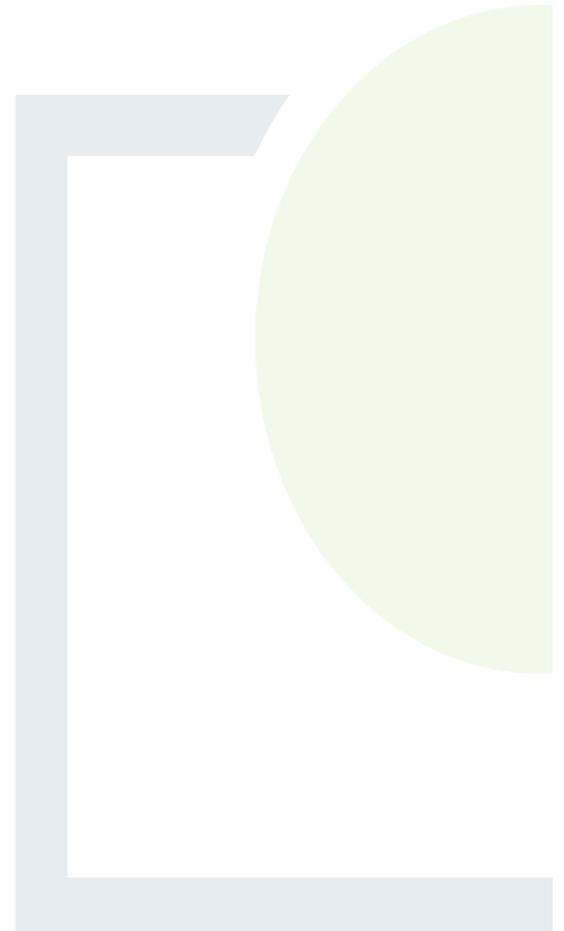
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Abstract: Fehily Timoney & Company was commissioned by Fingal County Council to prepare a Site Specific Flood Risk Assessment in response to a Further Information Request related to a Part XI application (reg. reference PARTXI/009/21) for the proposed maintenance building in Balleally Landfill / Rogerstown Park site, Lusk, Co. Dublin. The Site Specific Flood Risk Assessment was prepared in accordance with the guidelines produced by the Department of Environment, Heritage and Local Government (DoEHLG) – “*The Planning System and Flood Risk Management -Guidelines for Planning Authorities*” (November 2009).

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1. INTRODUCTION

1.1 Introduction

Fehily Timoney & Company (FT) was commissioned by Fingal County Council (FCC) to prepare a Site-Specific Flood Risk Assessment (SSFRA) in response of a Further Information Request from the Drainage Department of Fingal County Council in relation to a Part XI application (Reg. reference PARTXI/009/21) for the proposed maintenance building in Balleally Landfill site, Lusk, Co. Dublin,

The site-specific flood risk assessment was prepared in accordance with the guidelines produced by the Department of Environment, Heritage and Local Government (DoEHLG) – *“The Planning System and Flood Risk Management - Guidelines for Planning Authorities”* (November 2009).

Balleally Landfill is in the aftercare and management phase and the site is transitioning from a waste facility to its future use as a public amenity in Rogerstown Park. The Environmental Protection Agency (EPA) issued Fingal County Council (FCC) with Waste Licence Reg. No. W0009-02 for its landfill at Balleally, Lusk, County Dublin, on 8th January 2003. A review of that waste licence was issued in 2009 (Reg. No. W0009-03). The licence was subsequently transferred to an Industrial Emission licence in accordance with the requirements of the Industrial Emission Directive 2010/75/EU on the 20th December 2013.

1.2 Objectives

The objectives of this report are to inform the planning authority regarding flood risk for the potential development of the lands.

The report will provide the following:

- The site’s flood zone category.
- Information to allow an informed decision of the planning application in the context of flood risk.
- Appropriate flood risk mitigation and management measured for any residual flood risk.

1.3 Scope

This SSFRA relates to the proposed maintenance building in the Balleally Landfill Site and its immediate surroundings only. This report uses information obtained from various sources, together with an assessment of flood risk for the existing site and proposed development.

1.4 National, Regional and Local Spatial Plans

The relevant Development Plan is the Fingal Development Plan 2017-2023. The objectives set out in page 275 of this plan relating to surface water and flood risk management are summarized below:



1.4.1 OBJECTIVE SW01

Protect and enhance the County's floodplains, wetlands and coastal areas subject to flooding as vital green infrastructure which provides space for storage and conveyance of floodwater, enabling flood risk to be more effectively managed and reducing the need to provide flood defences in the future and ensure that development does not impact on important wetland sites within river / stream catchments.

1.4.2 OBJECTIVE SW02

Allow no new development within floodplains other than development which satisfies the justification test, as outlined in the Planning System and Flood Risk Management Guidelines 2009 for Planning Authorities (or any updated guidelines).

1.4.3 OBJECTIVE SW03

Identify existing surface water drainage systems vulnerable to flooding and develop proposals to alleviate flooding in the areas served by these systems.

1.4.4 OBJECTIVE SW04

Require the use of sustainable drainage systems (SuDS) to minimise and limit the extent of hard surfacing and paving and require the use of sustainable drainage techniques where appropriate, for new development or for extensions to existing developments, in order to reduce the potential impact of existing and predicted flooding risks.

1.4.5 OBJECTIVE SW05

Discourage the use of hard non-porous surfacing and pavements within the boundaries of rural housing sites.

1.4.6 OBJECTIVE SW06

Encourage the use of Green Roofs particularly on apartment, commercial, leisure and educational buildings.

1.4.7 OBJECTIVE SW07

Implement the Planning System and Flood Risk Management-Guidelines for Planning Authorities (DoEHLG/OPW 2009) or any updated version of these guidelines. A site-specific Flood Risk Assessment to an appropriate level of detail, addressing all potential sources of flood risk, is required for lands identified in the SFRA, located in the following areas: Courtlough; Ballymadun; Rowlestown; Ballyboghil; Coolatrath; Milverton, Skerries; Channell Road, Rush; Blakescross; Lanestown/Turvey; Lissenhall, Swords; Balheary, Swords; Village/Marina Area, Malahide; Streamstown, Malahide; Balgriffin; Damastown, Macetown and Clonee, Blanchardstown; Mulhuddart, Blanchardstown; Portrane; Sutton; and Howth, demonstrating compliance with the aforementioned Guidelines or any updated version of these guidelines, paying particular attention to residual flood risks and any proposed site specific flood management measures.



1.4.8 OBJECTIVE SW08

Implement the recommendations of the Fingal East Meath Flood Risk Assessment and Management Study (FEMFRAMS).

1.4.9 OBJECTIVE SW09

Assess and implement the recommendations of the Eastern CFRAMS when complete.

1.4.10 OBJECTIVE SW10

Require the provision of regional stormwater control facilities for all Local Area Plan lands and Strategic Development Zones with a view to also incorporating these control facilities in currently developed catchments prone to flooding.

1.4.11 OBJECTIVE SW11

Ensure that where flood protection or alleviation works take place that the natural and cultural heritage of rivers, streams and watercourses are protected and enhanced to the greatest extent possible.

1.4.12 OBJECTIVE SW12

Require an environmental assessment of all proposed flood protection or alleviation works.

1.4.13 OBJECTIVE SW13

Provide for the schemes listed in Table SW01:

Table 1-1: Table SW01 Extract from Fingal Development Plan 2017-2023

TABLE SW01: SURFACE WATER SCHEMES
1. Implementation of Fingal East Meath Flood Risk Assessment and Management Study (FEM-FRAMS), Measures - Flood Mitigation
2. Implementation of CFRAMS : Eastern CFRAMS Measures
3. Early Flood Warning System
4. Donabate Surface Water System
5. Garristown Surface Water System

1.5 Approach

The Flood Risk Assessment (FRA) Methodology is presented in Section 2 of this report and it considers the *Guidelines for Planning Authorities* as they relate to the proposed application.



The Stage 1 Flood Risk Identification is presented in Section 3.

The Stage 2 Initial Flood Risk Assessment is included in Section 4.

The Stage 3 detailed assessment of specific flood risks and residual risks relating to the proposed development is presented in Section 5.

Conclusions and recommendations are presented in Chapter 6.

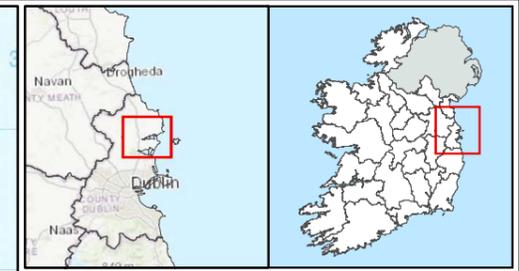
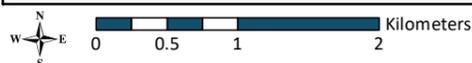
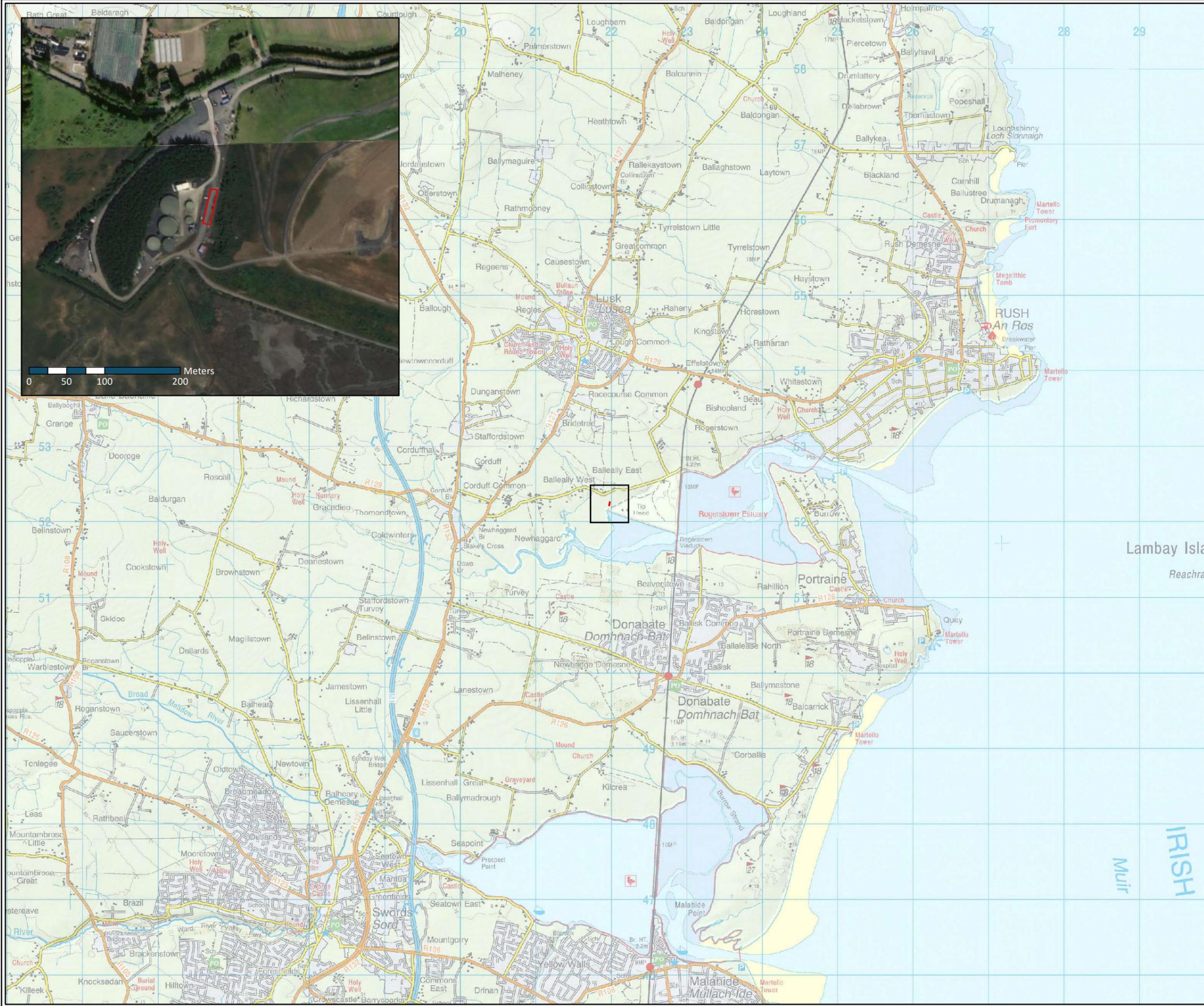
1.6 Existing Site

Figure 1-1 and Figure 1-2 show the site location and existing water features respectively.

Balleally Landfill is situated in north County Dublin, approximately 18 km from Dublin City and 4.5 km south of the village of Lusk. The landfill is located on the northern margin of Rogerstown Estuary and is bounded to the east by the Dublin-Belfast railway line. The proposed maintenance building will be located to the east of the existing leachate treatment plant located in the south-western end of the Balleally Landfill site. The development lands are currently part of internal access tracks about the existing leachate treatment plant and perimeter of the landfill.

The site is located within the Nanny-Delvin Catchment (ID: 08) and the Palmerstown Sub-Catchment (EPA Palmerstown_SC_010 , ID: 08_2).

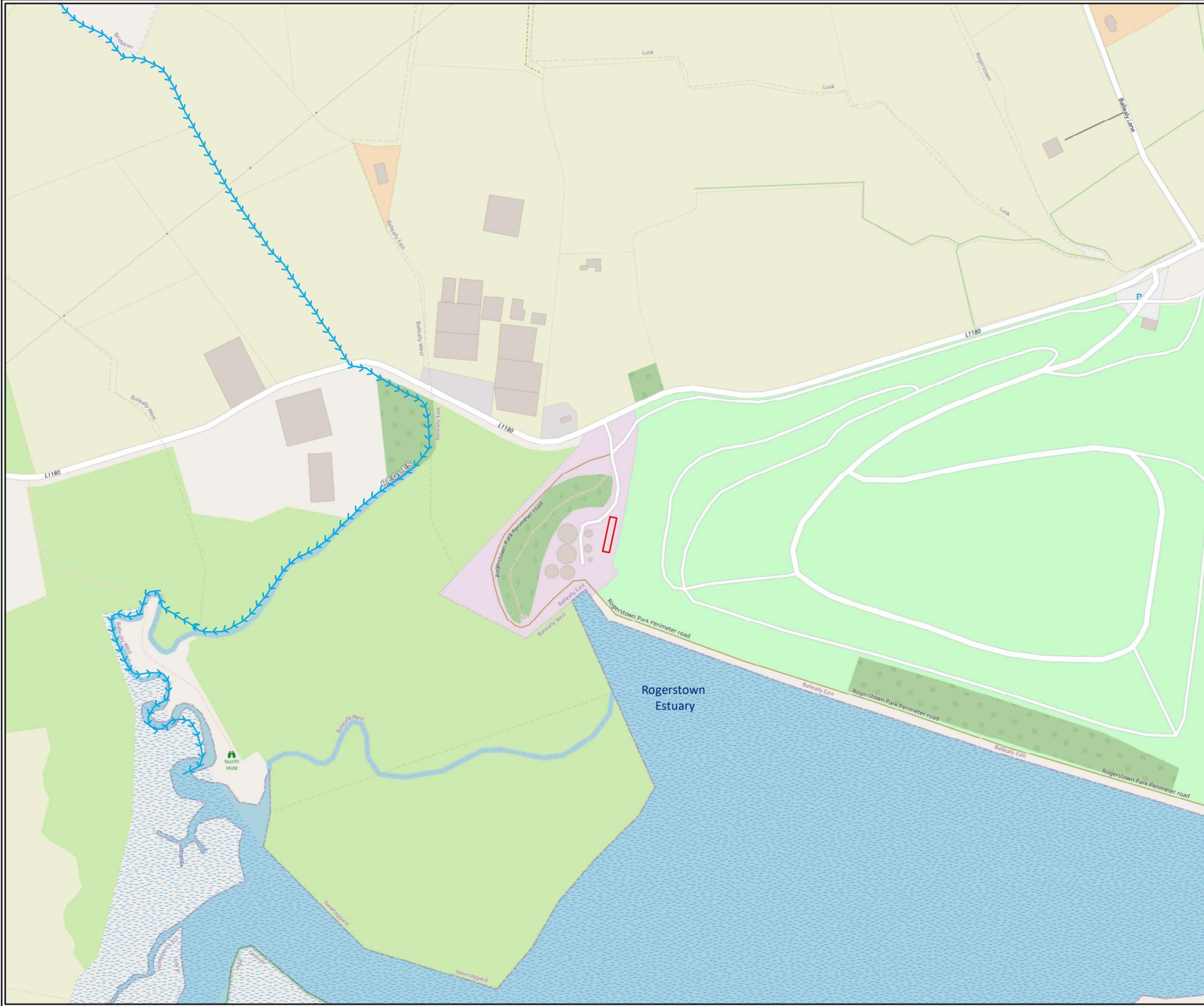
A topographic survey of the site indicates that ground falls across the development lands are from south to north towards the main access to the Leachate Treatment Plant from Balleally Lane.



Proposed Shed Location

TITLE:	Site Location
PROJECT:	Maintenance Shed at Rogerstown Park
FIGURE NO:	1.1
CLIENT:	Fingal County Council
SCALE:	1:50000
REVISION:	0
DATE:	04/03/2021
PAGE SIZE:	A3



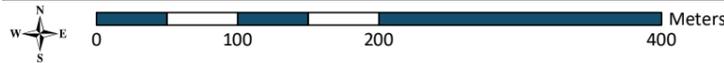


Legend

- Proposed Shed Location
- >>> Rivers

TITLE:	
Existing Water Features	
PROJECT:	
Proposed Maintenance Building in Balleally Landfill Site, Lusk, Co. Dublin	
FIGURE NO: 1.2	
CLIENT: Fingal County Council	
SCALE: 1:5000	REVISION: 0
DATE: 02/09/2021	PAGE SIZE: A3

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1.7 Existing Services

As-Built Drawings DANCOR P0420-T500-001 and DANCOR P0420-T800-001 dated 08/04/2019 presenting existing drainage and services in the site are included in Appendix 1 of this report.

The as-built records show two existing parallel 225 mm diameter foul /leachate and surface water drains running along the east of the proposed development.

The foul/leachate drains outfall to leachate collection sump (P1) to the south-east of the proposed development. The collected foul/leachate is pumped to the adjacent leachate treatment plant for treatment/storage before being pumped via a dedicated pump station (P2) and rising main from the landfill to the local foul water pumping station located on Rogerstown Lane. The combined foul water and leachate from the landfill and wider local area is collected at the Rogerstown lane Pumping station and thereafter pumped to Portrane Wastewater Treatment Plant (WWTP) for treatment.

Refer to Figure 1-3 for location of pump sumps.

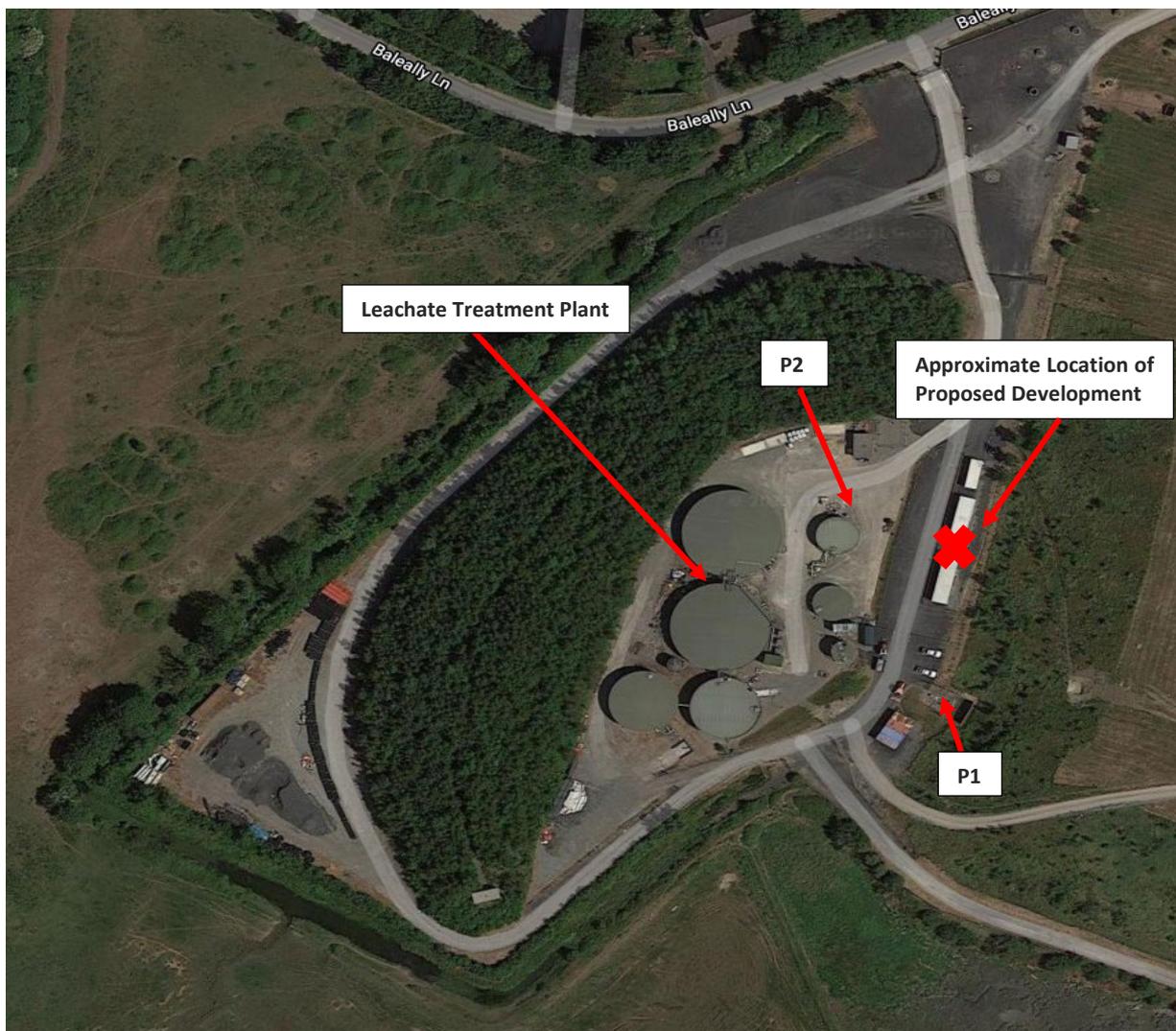


Figure 1-3: Aerial View of the Site



Surface water is discharged to the Rogerstown Estuary approximately 75 m south west of the proposed development via a 225mm diameter outfall pipe. The outfall pipe to the Rogerstown Estuary is equipped with a ductile iron flap valve to prevent backflow from the estuary to the drainage in the site.

The leachate treatment plant to the west of the proposed development is a bunded containment area to prevent the accidental discharges of leachate entering the adjacent Rogerstown Estuary.

1.8 Proposed Development

The proposed development will comprise a two-storey detached maintenance building in Balleally Landfill Site, Lusk, Co. Dublin. The maintenance building will provide storage room for vehicles and equipment used to operate and maintain Rogerstown Park.

The maintenance building will be approximately 8.5m wide by 45m long with a total height of 8.2m. The total floor area for the development is approximately 354 m² comprising a ground floor area of approximately 315m² and first-floor area of approximately 39m².

The ground floor level will be divided into the following areas:

- Maintenance shed for the storage of maintenance vehicles associated with Rogerstown Park.
- Water Closet (WC).
- Equipment store – a separate lockable storage room for general maintenance equipment.

The following areas are proposed at first floor level:

- Mezzanine store – additional small item storage room accessible via stairs.

The landscaping surrounding the building will mainly consist of compacted gravel and concrete footpaths around the perimeter of the building.

Vehicular access to the maintenance building will be provided from the existing access to the Leachate Treatment Plant.

1.9 Proposed Services

The following services are proposed

- Surface Water Drainage System including attenuation
- Foul Water Management System including Packaged Pump Station
- Potable water Connection to existing on site services
- Electrical Connection to existing Site Sub Station Distribution Panel
- Data and Communication Connection to Existing Administration Building



2. FLOOD RISK ASSESSMENT METHODOLOGY

2.1 General

The *Guidelines for Planning Authorities* and its Technical Appendices outline the requirements for a SSFRA. The *Guidelines for Planning Authorities* requires that works:

- Avoid development in areas at risk of flooding.
- Substitute less vulnerable uses, where avoidance is not possible.
- Mitigate and manage the risk, where avoidance and substitution are not possible.

The key principles of the *Guidelines for Planning Authorities* are to apply the **Sequential Approach** to the planning process. Figure 2-1 of this report describes the mechanism of the sequential approach for use in the planning process.

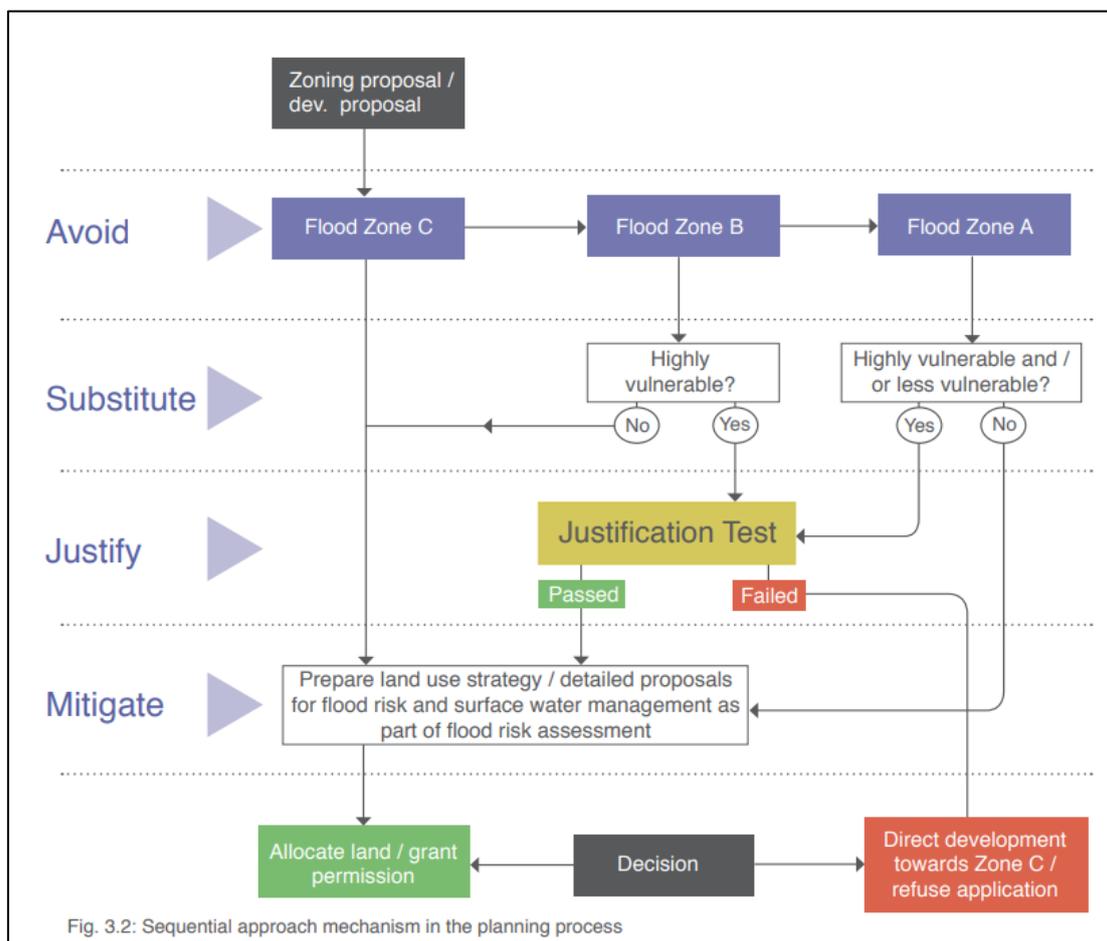


Figure 2-1: Sequential Approach Mechanism¹

¹ Figure 3.2 of the *Guidelines for Planning Authorities*.



2.2 Source-Pathway-Receptor Model

The assessment of flood risk requires a thorough understanding of:

- The sources of flood water (e.g. high sea levels, intense or prolonged rainfall leading to runoff and increased flow in rivers and sewers)
- The pathways by which the flood water reaches those receptors (e.g. river channels, river and coastal floodplains, drains, sewers and overland flow).
- The people and assets affected by flooding (known as the receptors).

The Source-Pathway-Receptor (S-P-R) Model illustrated in Figure 2-2 has become widely used to assess and inform the management of environmental risks.

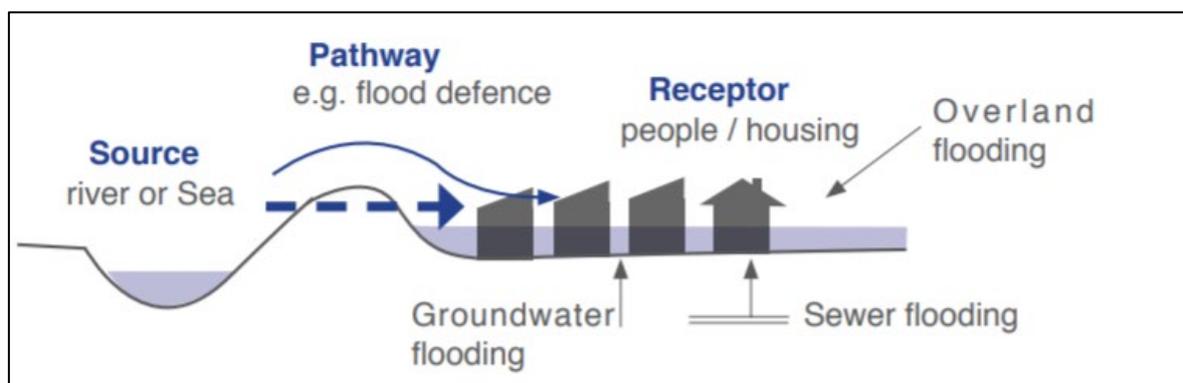


Figure 2-2: Source-Pathway- Receptor Model²

2.3 Likelihood of Flooding and Definition of Flood Zones

The *Guidelines for Planning Authorities* define the likelihood of flooding as the percentage probability of a flood of a given magnitude occurring or being exceeded in any given year. Likelihood of flooding is expressed as a return period or annual exceedance probability (AEP).

Flood Zones are graphical areas within which the likelihood of flooding is in a particular range. They are a key tool in flood risk management within the planning process as well as in flood warning and emergency planning. These flood zones are split into three categories in the *Guidelines for Planning Authorities*.

- **Flood Zone A** – where the probability of flooding from rivers and the sea is high (greater than 1% AEP for river flooding or 0.5% AEP for coastal flooding).
- **Flood Zone B** – where the probability of flooding from rivers and the sea is moderate (between 0.1% AEP and 1% AEP for river flooding and between 0.1% AEP and 0.5% AEP for coastal flooding).
- **Flood Zone C** – where the probability of flooding from rivers and the sea is low (less than 0.1% AEP for both river and coastal flooding).

² Source: Fig 2.2 of the *Guidelines for Planning Authorities*.



2.4 Classification of the Proposed Development and Justification Test

The *Guidelines for Planning Authorities* categorises all types of development as either:

- Highly Vulnerable (garda, ambulances, schools, hospitals, dwelling houses, student halls...).
- Less Vulnerable (buildings used for: retail leisure, warehousing, commercial, industrial, and non-residential institutions,...).
- Water Compatible (flood control infrastructure, docks, marinas, amenity open spaces,...).

Full list of types of development and related vulnerability classes are provided in Table 3.1 of the *Guidelines for Planning Authorities*. Uses which are not listed in the table should be considered on their own merits.

The Sequential Approach restricts development types to occur within the flood zone appropriate to their respective vulnerability classes. Table 2-1 identifies the types of development appropriate for each flood zone and those that will require a Justification Test.

Table 2-1: Matrix of Vulnerability Versus Flood Zone³

	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development (including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less vulnerable development	Justification Test	Appropriate	Appropriate
Water-compatible development	Appropriate	Appropriate	Appropriate

The Justification Test has been designed to rigorously assess the appropriateness of developments that are being considered in areas of moderate or high flood risk. The test comprised the following two processes:

- The first is the Plan-making Justification Test which is used at the plan preparation and adoption stage where it is intended to zone or otherwise designate land which is at moderate or high risk of flooding.
- The second is the Development Management Justification Test which is used at the planning application stage where it is intended to develop land at moderate or high risk of flooding for uses or development vulnerable to flooding that would generally be inappropriate for that land.

2.5 Flood Risk Assessment Stages

The *Guidelines for Planning Authorities* outline that a staged approach should be adopted when carrying out a SSFRA. These stages, see also Figure 2-3 below are:

- Stage 1 Flood Risk Identification.
- Stage 2 Initial Flood Risk Assessment.
- Stage 3 Detailed Flood Risk Assessment.

³ Source: Table 3.2 of the *Guidelines for Planning Authorities*.

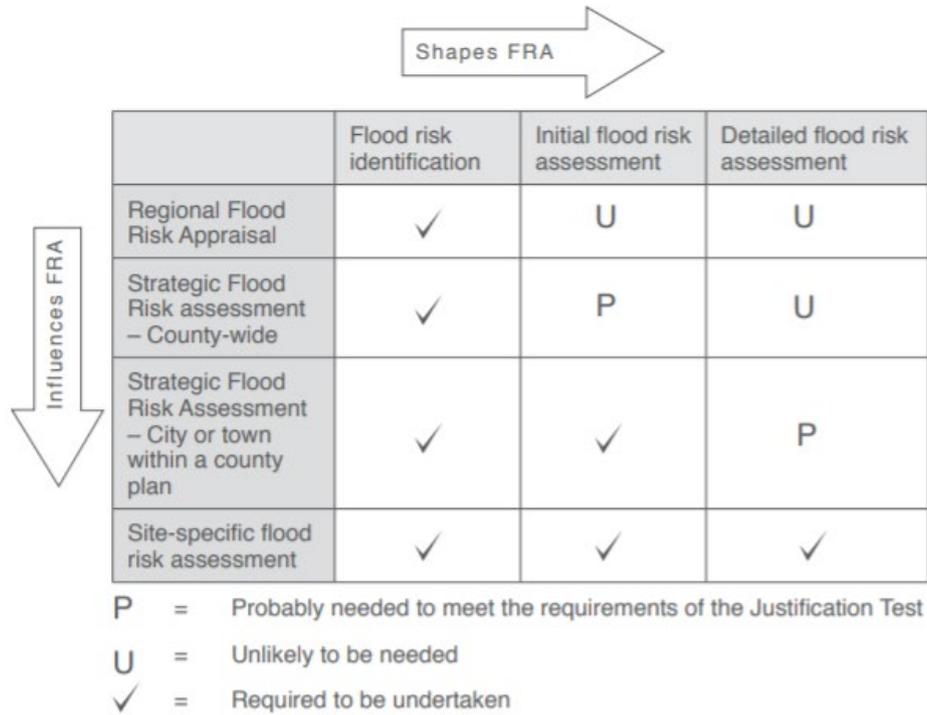


Figure 2-3: Flood risk assessment stages required per scale of study undertaken⁴

Stage 1: Flood risk identification – to identify whether there may be any flooding or surface water management issues relating to the proposed development site that may warrant further investigations. Flood risk identification stage uses existing information to identify whether there may be any flooding or surface water management issues related to the site. Flood risks identified in this stage are then addressed in Stage 2.

Stage 2: Initial flood risk assessment – to confirm sources of flooding that may affect the development site, to appraise the adequacy of existing information and to determine what surveys and modelling approach is appropriate to match the spatial resolution required and complexity of the flood risk issues. This stage involves the review of data addressed in Stage 1. Data where the flood risk at the site is recognized as being low is screened out and it is not further addressed in the report, data which recognized the flood risk on the site to be medium or high is further analyzed in the report.

Stage 3: Detailed flood risk assessment – to assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk to a proposed or existing development, of its potential impacts on flood risk elsewhere and of the effectiveness of any proposed mitigation measures. This will typically involve use of an existing or construction of a hydraulic model across a wide enough area to appreciate the catchment wide impacts and hydrological process involved.

⁴ Source: Appendix A of *Guidelines for Planning Authorities*, Table A3.



3. STAGE 1 – FLOOD RISK IDENTIFICATION

3.1 Information Sources

The flood risk identification stage uses existing information to identify whether there may be any flooding or surface water management issues related to the site.

Data required for the flood risk identification was obtained from various sources, as listed in Table 3.1 below.

Table 3-1: Information Sources

Information Type	Source Consulted
Predictive and historic flood maps, and Benefiting Lands Maps;	Available on: www.floodinfo.ie
Predictive flood maps produced under the CFRAM Studies;	Available on: www.floodinfo.ie
Existing Flood Risk Assessments;	Strategic Flood Risk Assessment for the Fingal Development Plan 2017-2023
Information on historic flood events, including flooding from all sources;	Historic flood hazard maps and information obtained from OPW's website www.floodinfo.ie
Consultation with Local Authorities who may be able to provide knowledge on historic flood events and local studies etc.;	FCC
Topographical maps, in particular digital elevation models produced by aerial survey or ground survey techniques;	Topographical Survey of the Site Available
Alluvial deposit and groundwater flooding maps of the Geological Survey of Ireland (GSI) ;	Available at https://www.gsi.ie
'Liable to flood' markings on the old '6 Inch' maps;	Historic OSI maps
Walkover survey to assess potential sources of flooding, likely routes for flood waters and the site's	Walkover survey conducted



key features, including flood defences, and their condition; and	
National, regional and local spatial plans, such as the National Spatial Strategy, regional planning guidelines, development plans and local area plans provide key information on existing and potential future receptors.	Fingal Development Plan 2017-2023

3.2 Tidal Flooding

The development site is located approximately 75 m north of the Rogerstown Estuary which is a potential risk for tidal flooding. Sections 3.2.1 and 3.2.2 provide a description of information available in two sources listed in Table 3-1.

3.2.1 Predictive Flood Maps Produced Under the CFRAM Studies

The National Catchment Flood Risk Assessment and Management (CFRAM) Programme was developed to meet the requirements of the EU Flood Directive (2007/60/EC), as well as to deliver on core components of the 2004 National Flood Policy. The OPW is the lead agency for flood risk management in Ireland and is the national competency authority for the EU Flood Directive.

From consultation of the OPW website www.floodinfo.ie it was noticed the availability of a Donabate Tidal Flood Extent Map from September 2016 prepared for the Fingal East Meath FRAM Study. This flood map includes the subject site and is added to Appendix 2 of this report.

The flood map indicates tidal flood extents of 0.1%, 0.5% and 10% Annual Exceedance Probability (AEP) to the south of the Balleally Landfill Site. The predictive flood map does not indicate risk of flooding within the development site.

3.2.2 Existing Flood Risk Assessments

The Strategic Flood Risk Assessment for the Fingal Development Plan 2017-2023 provides an assessment based on datasets available in February 2017 including the Eastern CFRAM Study, Fingal East Meath Flood Risk Assessment and Management Study (FEM FRAMS), the Preliminary Flood Risk Assessment (PFRA) and the River Tolka Flooding Study Final Report.

The Fingal Development Plan 2017-2023 page in FCC’s website provides an online predictive flood map for the study area. Figure 3-1 shows predictive 0.5% AEP flood extents to the south of the Balleally Landfill Site and within the Leachate Treatment Plant to the west of the proposed development. The assessments does not indicate risk of flooding within the development site.

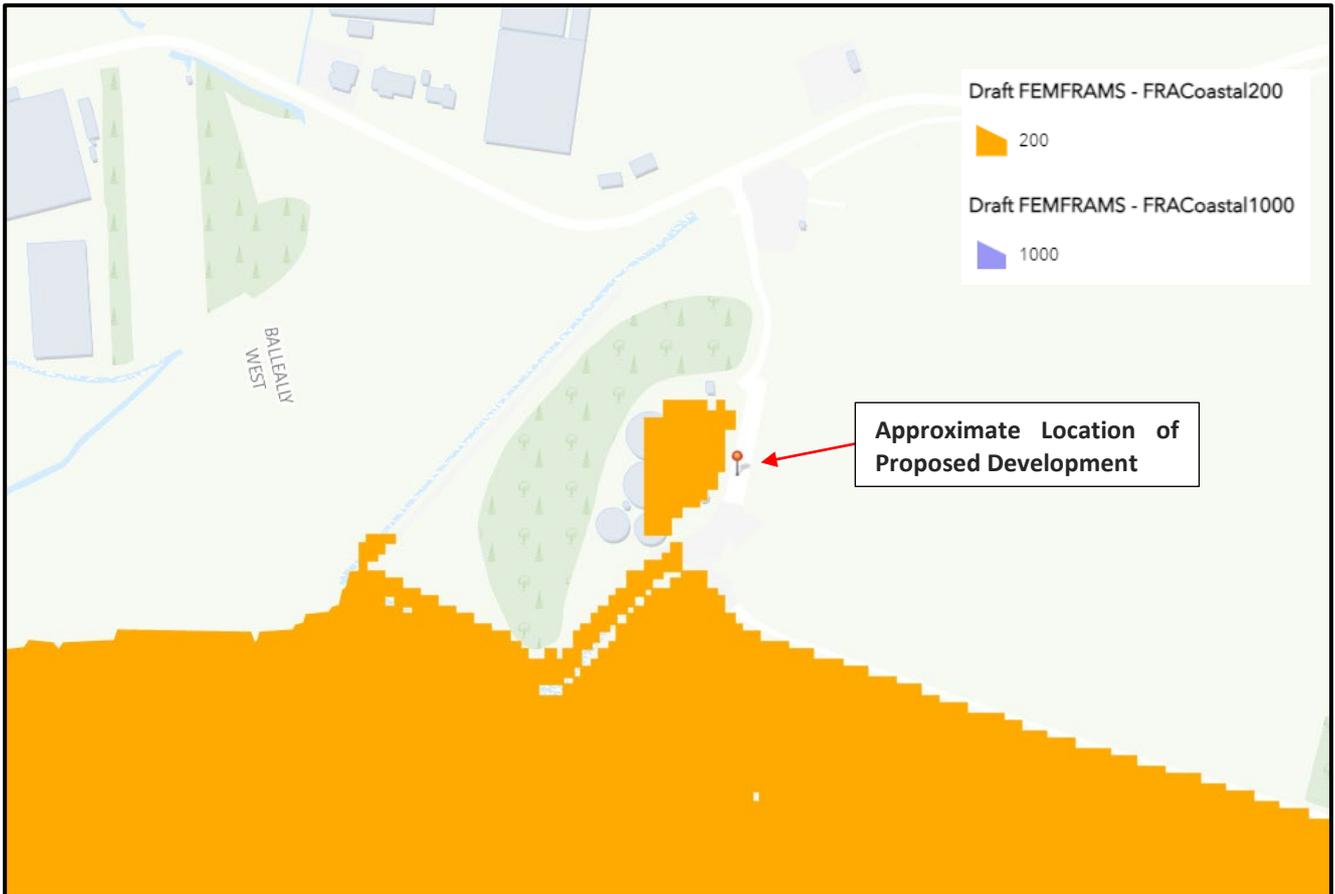


Figure 3-1: Snip from Fingal Development Plan 2017-2023 Draft FEMFRams Viewer

3.2.3 OPW Predictive and Historic Flood Maps, and Benefit Lands Maps and Flood Hazard Information

The OPW Past Flood Event Local Area Summary Report included in Appendix 3 highlights previous flood events within a radius of 2.5 km of a selected location. The report lists a total of 9 flood events, 3 being single flood events and 6 being recurring flood events.

The only relevant flood event to the development site is the recurring event in Balleally Lane (ID-1637) which is associated with the coastal catchment. According to report *Fingal County Meeting Roads East-Minutes* dated 5th of April 2005 this recurring flood event restricts access to the Balleally Landfill Site. This recurring flood event however took place approximately 900m north-east from the development site and therefore is not expected to restrict access and egress to the proposed maintenance building.

It is noted that extensive improvement works were completed in 2019 to mitigate/remove the risk of flooding at this location. Works were completed by Fingal County Council included reconfiguration of the local drainage as well as the vertical and horizontal realignment of the existing road above the flooding level.

No flooding impacts were confirmed within the site from the information available on OPW website.



3.3 Groundwater Flooding

There are no indications of groundwater flooding in the subject site from the GSI data available and any of the sources listed in Table 3-1.

3.4 Fluvial Flooding

Following consultation of the sources listed in Table 3-1 there is no indication of fluvial flooding within the development site and its surroundings.

3.5 Consultation of Other Sources

Other information sources consulted for the flood risk identification exercise are outlined in Table 3-2 below.

Table 3-2: Other Information Sources Consulted

Information Source	Identified Flood Risks	Flood Risks at Site
Local Authorities – FCC	<p>At present surface water outflow from the leachate treatment facility is manually released by opening a sluice valve in an outfall manhole located in the south eastern end of the facility area. Because staff do not provide 24/7 cover, the facility has occasionally been flooded flowing intense overnight or weekend heavy rainfalls events. However the leachate treatment plan is a bunded area where flood water is retained in these events until the sluice valve is opened again by site staff. There are no records of these flooding events affecting the development site.</p> <p>Since the opening of Rogerstown Park in 2019 there has been no records of flooding within the development site.</p>	None indicated
Topographical Survey	<p>Topographical survey of the site indicate low points within the development site. However proposed levels for the development will eliminate low points and modify falls in the site from south to north.</p>	None indicated
GSI maps	<p>Topsoil classified as '<i>marine/estuarine sediments</i>'</p> <p>Subsoils classified as '<i>estuarine silts and clays</i>'</p>	None indicated



	Subsoil permeability is classified as low.	
Historic OSI Maps	None	None indicated
Walkover survey	None	None indicated
National, regional and local spatial plans – Fingal Development Plan 2017-2023	Development site zone objective defined as ‘ <i>protect and enhance high amenity areas</i> ’. The vision of this objective is to <i>protect these highly sensitive and scenic locations from inappropriate development and reinforce their character, distinctiveness and sense of place. In recognition of the amenity potential of these areas opportunities to increase public access will be explored.</i>	None indicated

3.6 Source-Pathway- Receptor Model

A Source-Pathway-Receptor model, see Table 3-3 summarizes the possible sources of floodwater, the receptors that maybe affected by potential flooding and the pathways by which flood water may reach the receptors. These sources, pathways and receptors will be assessed further in the Stage 2 the initial flood risk assessment.

Table 3-3: Source-Pathway-Receptor Analysis

Source	Pathway	Receptor	Likelihood
Tidal/Coastal	Rogerstown Estuary	Future Development and site staff	Likely
Fluvial	None	None	Unlikely
Pluvial	Increased runoff from developed site increasing flood levels	Future Development and site staff.	Likely
Groundwater (GW) flooding	Rising GW level on the site	Future Development and Site Staff.	Unlikely
Human/mechanical error (pluvial)	Existing/Proposed Services	Future Development and Site Staff	Likely



3.7 Development Classification

The proposed development is listed as a 'less vulnerable development' in the *Guidelines for Planning Authorities* under the following description: 'Buildings used for retail, leisure, warehousing, commercial, industrial and non-residential institutions'. Hence the proposed development is appropriate for Flood Zones B and C without the need for a justification test.



4. STAGE 2 – INITIAL FLOOD RISK ASSESSMENT

Flood risks identified during *Stage 1 – Flood Risk Identification* and outlined in Table 3-3 are noted below.

- Risk of tidal flooding from the Rogerstown Estuary;
- Risk of pluvial flooding.

These risks are assessed further in this section of the SSFRA.

4.1 Tidal Flood Risk Assessment

The predictive tidal flood map (see Appendix 2) developed as part of the Fingal East Meath FRAM Study provides the predicted extents of 0.1% AEP (low risk), 0.5% AEP (medium risk) and 10% AEP (high risk) tidal flooding within the subject site. The flood map shows flood zones A and B to the south of the Balleally Landfill Site.

Node point 039 is the closest node point to the development site included in the flood map, located approximately 110m south-east from the development site. Water levels for 0.5% AEP and 0.1% AEP are presented in Table 4-1 below. Flood levels for future scenario are not available therefore for the purpose of this exercise it is assumed that 0.1 % AEP current scenario is the equivalent to 0.5% AEP Mid-Range Future Scenario (MRFS).

Table 4-1: Flood levels at relevant node points

Water Level	Node 039
0.5% AEP	3.25 mOD
0.1% AEP (0.5% MRFS)	3.47 mOD

Table 4-2 below compares the proposed finish floor level (FFL) of the proposed maintenance building and proposed surrounding ground levels with the 0.5% MRFS flood level presented in Table 4-1. The comparison shows that the proposed maintenance building is 530 mm above the 0.5% AEP MRFS water level and the lowest proposed ground level around the development is 380 mm above the 0.5% AEP MRFS water level.

Table 4-2: Proposed and Existing Levels

Location	Proposed Level (mAOD)	0.5% AEP MRFS Water Level (mOD)
Proposed Maintenance Building FFL	4.00	3.47
Lowest Proposed Level Around Development	3.85	3.47



Invert levels of the proposed surface water drainage for the maintenance building are lower than the 0.5% MRFS flood level presented in Table 4-1. This presents a risk of backflow of floodwater from the Rogerstown Estuary, however the existing surface water outflow pipe to the estuary is equipped with a ductile iron flap valve to prevent any backflow to the existing drainage, therefore also protecting the proposed surface water drainage.

Both the predictive tidal flood map developed as part of the Fingal East Meath FRAM Study and the Strategic Flood Risk Assessment for the Fingal Development Plan 2017-2023 indicate that the development site is outside the tidal flood extents. Hence it is considered that the development site is located within Flood Zone C.

4.2 Pluvial Flood Risk Assessment

The Source-Pathway-Receptor model identified that there could be potential for pluvial flood risk with the development related to the increase of impermeable surface within the subject site.

The impermeable area of the development results in approximately 350m² which represents the total floor area of the proposed maintenance building. This impermeable area is not considered to have significant impact on the development site.

The proposed surface water drainage strategy will provide sufficient attenuation volume and flow control measures to compensate the impact of increasing the impermeable area in the site.

In conclusion it is considered in this *Stage 2 - Initial Flood Risk Assessment* that the pluvial flood risk within the site is not significant and therefore will not be further assessed in *Stage 3 – Detailed Flood Risk Assessment*.



5. STAGE 3 – DETAILED FLOOD RISK ASSESSMENT

In *Stage 2 – Initial Flood Risk Assessment* it was established a 0.5% AEP MRFS water level of 3.47 mOD for tidal flooding.

The proposed finished floor levels presented in Table 4-2 are 530mm and 380mm respectively above the 0.5% AEP MRFS water level which guarantees that the proposed building will be safe from floodwater.

5.1 Impact on Adjacent Areas

Excess surface water runoff caused by potential backflow of floodwater from the Rogerstown Estuary and storm event in excess of the 1% AEP will be drained to the north of the development site. This may present a risk of flooding the access to the proposed development from Balleally Lane.

5.2 Mitigation Measures

Proposed mitigation measures to address residual flood risks are summarized below:

1. Provision of flood warnings and evacuation plans including coordination with relevant emergency services.
2. Ensuring public awareness of flood risks to local residents.
3. Ensuring that Rogerstown Park visitors parking is only allowed in the recently constructed parking in the north-eastern end of the Balleally Landfill Site.
4. Regular supervision and maintenance of existing and proposed drainage.

It is considered that the flood mitigation measures listed above if implemented are sufficient to provide a suitable level of protection to the proposed development.

5.3 Residual Risk

Invert levels of the proposed surface water drainage for the maintenance building are lower than the 0.5% MRFS flood level. This presents a risk of backflow of floodwater from the Rogerstown Estuary.

Section 2.25 of the *Guidelines for Planning Authorities* states the following:

‘the provision of flood protection measures in appropriate locations, such as in or adjacent to town centres, can significantly reduce flood risk. However the presence of flood protection structures should be ignored in determining flood zones. This is because areas protected by flood defences still carry a residual risk of flooding from overtopping or breach of defences and the fact that there may be no guarantee that the defences will be maintained in perpetuity’.



Considering the recommendation of the *Guidelines for Planning Authorities* there may be a risk of local flooding caused by backflow from Rogerstown Estuary.

In a scenario where the proposed drainage reached its full capacity because of backflow from the Rogerstown Estuary any surface water runoff from the proposed development will be drained through a large surface of compacted gravel enhancing infiltration and any water exceedance will follow the natural falls of the site to the north of the proposed development. It is noted that the proposed development only represent a small increase in impermeable area and therefore it is not expected to cause a significant impact in relation to surface water runoff.

Similarly, in the case that a storm event in excess of the 1% AEP occurs as the proposed drainage reached its full capacity the compacted gravel material surrounding the proposed maintenance building will enhance water infiltration and proposed levels will divert excess runoff away from the proposed maintenance building.



6. CONCLUSION

The SSFRA for the proposed development at Balleally Landfill Site was undertaken in accordance with the requirements of the guidelines produced by the Department of Environment, Heritage and Local Government (DoEHLG) – “*The Planning System and Flood Risk Management -Guidelines for Planning Authorities*” (November 2009).

The proposed development is listed as a ‘less vulnerable development’ in the *Guidelines for Planning Authorities* under the following description: ‘Buildings used for retail, leisure, warehousing, commercial, industrial and non-residential institutions’.

Following the flood risk assessment it was determined the proposed maintenance building is located within Flood Zone C.

It is concluded that:

- The proposed development is appropriate for the Site’s flood zone category.
- The *Guidelines for Planning Authorities* sequential approach is met and the ‘Avoid’ principal achieved.
- A Justification Test is not required for the proposed development.
- The proposed development does not increase the flood risk within the site and adjacent to the site.

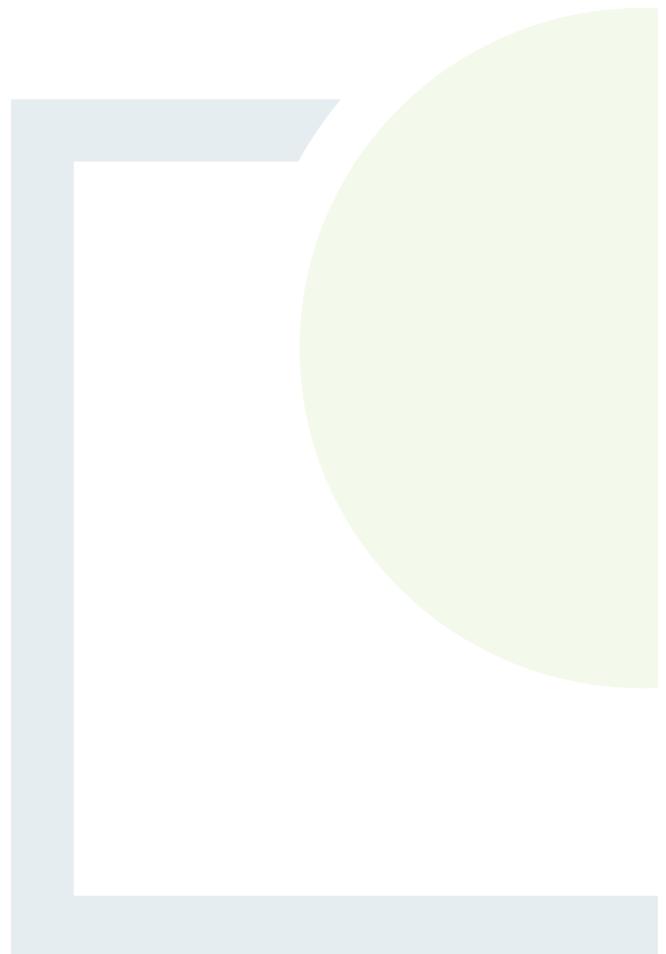


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APPENDIX 1

Existing Services Layouts



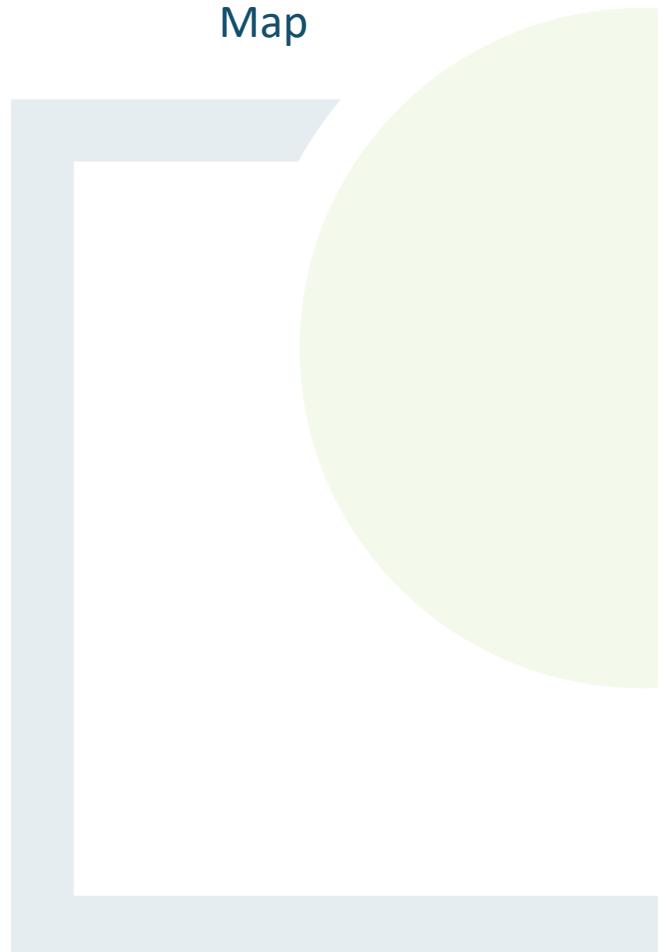


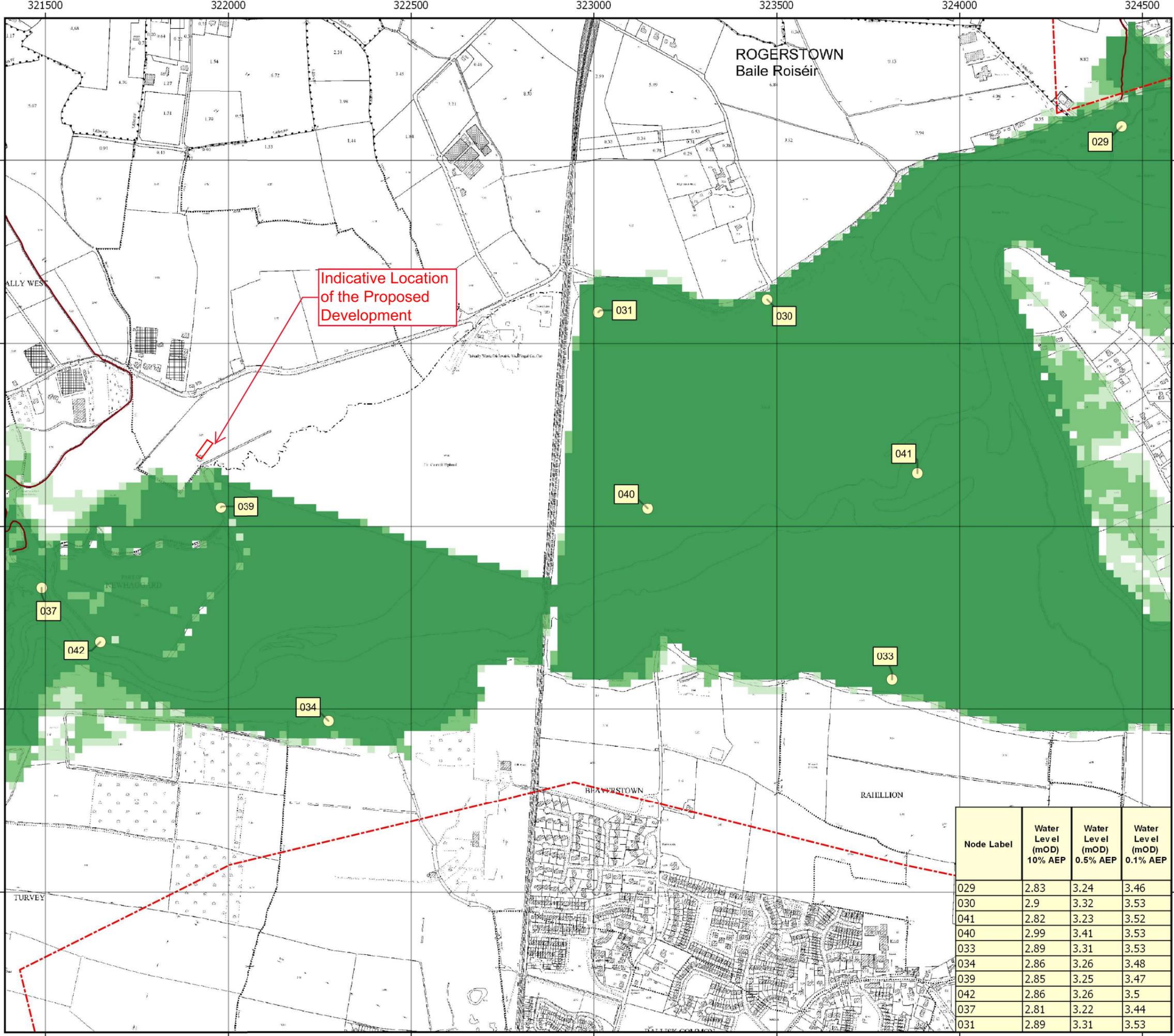
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APPENDIX 2

Donabate Tidal Flood Extent
Map





- ### LEGEND
- AFA Boundary
 - Defended Area
 - Modelled River Centreline
 - Node Point
 - 10% AEP Tidal Extent (High Risk)
 - 0.5% AEP Tidal Extent (Medium Risk)
 - 0.1% AEP Tidal Extent (Low Risk)
 - Flood Defence - Embankment
 - Flood Defence - Wall
 - Gate
 - NODE123 Node Label
 - x.x% AEP Standard of Protection of Flood Defence

IMPORTANT USER NOTE:
 THE VIEWER OF THIS MAP SHOULD REFER TO THE
 DISCLAIMER, GUIDANCE NOTES AND CONDITIONS
 OF USE THAT ACCOMPANY THIS MAP.



The Office of Public Works
 Jonathan Swift Street
 Trim
 Co. Meath

Project:		FINGAL EAST MEATH FRAM STUDY	
Map:		DONABATE TIDAL FLOOD EXTENT MAP	
Map Type:	EXTENT		
Source:	TIDAL		
Map Area:	HPW		
Scenario:	CURRENT		
Drawn by:	IH	Date:	Sep - 2016
Checked by:	MC	Date:	Sep - 2016
Approved by:	JM	Date:	Sep - 2016
Map No.:	E08DOB_EXCCD_F0_19		
Revision:	F0		
Map Scale:	1:10,000	Plot Scale:	1:1 @ A3

Node Label	Water Level (mOD) 10% AEP	Water Level (mOD) 0.5% AEP	Water Level (mOD) 0.1% AEP
029	2.83	3.24	3.46
030	2.9	3.32	3.53
041	2.82	3.23	3.52
040	2.99	3.41	3.53
033	2.89	3.31	3.53
034	2.86	3.26	3.48
039	2.85	3.25	3.47
042	2.86	3.26	3.5
037	2.81	3.22	3.44
031	2.89	3.31	3.53

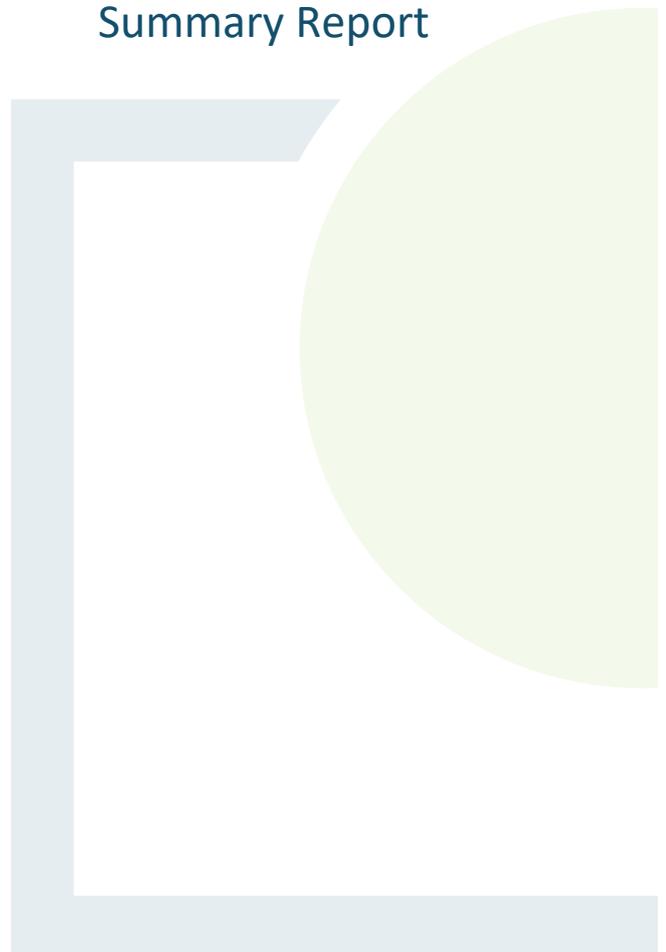


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APPENDIX 3

Past Flood Event Local Area
Summary Report

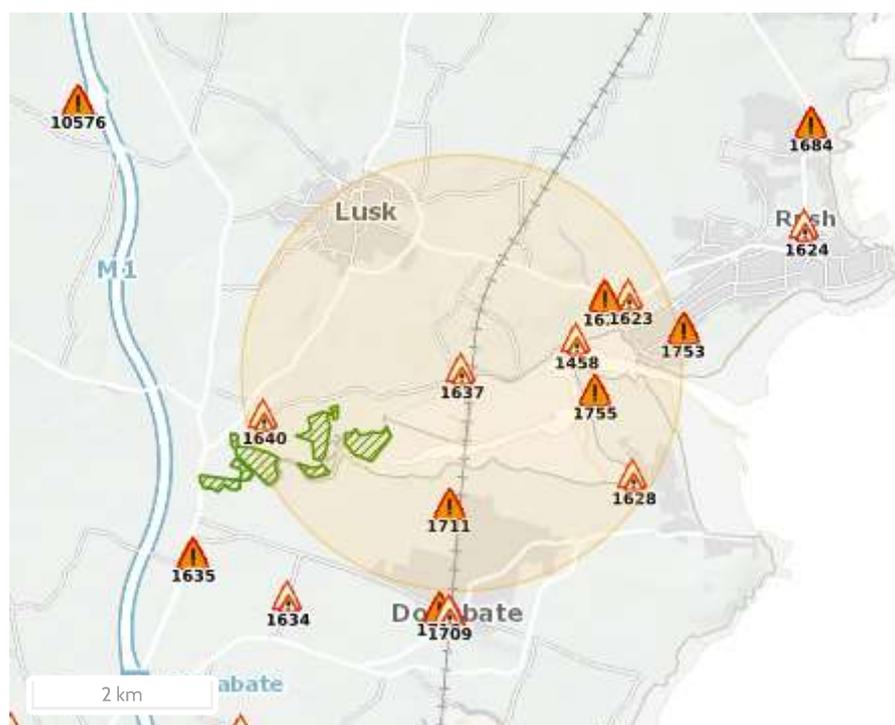




Report Produced: 20/8/2021 14:20

This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.

This report has been downloaded from www.floodinfo.ie (the "Website"). The users should take account of the restrictions and limitations relating to the content and use of the Website that are explained in the Terms and Conditions. It is a condition of use of the Website that you agree to be bound by the disclaimer and other terms and conditions set out on the Website and to the privacy policy on the Website.



Map Legend

- Single Flood Event
- Recurring Flood Event
- Past Flood Event Extents
- Drainage Districts Benefited Lands*
- Land Commission Benefited Lands*
- Arterial Drainage Schemes Benefited Lands*

* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained on Floodinfo.ie

9 Results

	Name (Flood_ID)	Start Date	Event Location
1.	Rogerstown Rush Recurring (ID-1458) Additional Information: Reports (4) , Press Archive (0)	n/a	Exact Point
2.	Beaverstown Nov 2002 (ID-1711) Additional Information: Reports (1) , Press Archive (0)	14/11/2002	Exact Point
3.	Whitestown Road Rush Recurring (ID-1623) Additional Information: Reports (5) , Press Archive (0)	n/a	Exact Point
4.	Spout Road Rogerstown/Rush Recurring (ID-1627) Additional Information: Reports (6) , Press Archive (0)	n/a	Exact Point
5.	The Burrow Portrane Recurring (ID-1628) Additional Information: Reports (3) , Press Archive (0)	n/a	Exact Point
6.	Balleally Lane Recurring (ID-1637) Additional Information: Reports (2) , Press Archive (0)	n/a	Exact Point

	Name (Flood_ID)	Start Date	Event Location
7.	 Corduff Stream Blake's Cross Lusk Recurring (ID-1640)	n/a	Exact Point
Additional Information: Reports (3) , Press Archive (0) .			
8.	 The Burrow Portrane Feb 2002 (ID-1755)	01/02/2002	Exact Point
Additional Information: Reports (2) , Press Archive (0) .			
9.	 Spout Road Rogerstown/Rush Aug 2004 (ID-2173)	18/08/2004	Exact Point
Additional Information: Reports (3) , Press Archive (0) .			



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