Comhairle Contae
Fhine Gall
Fingal County
Council

FINGAL DEVELOPMENT PLAN 2023–2029

DRAFT PLAN

STRATEGIC FLOOD RISK ASSESSMENT

FEBRUARY 2022

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1 INTRODUCTION

1.1 Terms of Reference

This Strategic Flood Risk Assessment (SFRA) was commissioned by Fingal County Council (Fingal CC) as part of the preparation of the Fingal Development Plan 2023-2029. The new plan sets out the vision for how Fingal should develop over the 6-year plan period in compliance with national and regional policies.

As stated in the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. No. 436 of 2004), a Strategic Environmental Assessment (SEA) must be prepared as part of any county development plan to assess the likely significant effects of the plan's implementation on the environment.

The Planning System and Flood Risk Management Guidelines for Planning Authorities 2009 (the OPW Guidelines) recommend that an SFRA be prepared to support the SEA of a development plan to ensure that flood risk, where identified, is considered as one of the key environmental criteria against which the plan is assessed. The SFRA should ultimately inform policy and land use decisions in areas that have been assessed as being at risk of flooding.

1.2 Purpose and Scope

The purpose of this report is to present a county-scale SFRA for the Fingal CC administrative area. In accordance with the OPW Guidelines, the scope of this SFRA report includes the following:

- Provide for an improved understanding of flood risk issues within the development plan and development management process and communicate this to a wide range of stakeholders.
- Assess existing flood defence infrastructure and the consequences of failure of that infrastructure
- Identify natural floodplain areas that should be safeguarded.
- Produce a suitably detailed Flood Risk Assessment (FRA) that draws on and extends existing data and information and that leads to a suite of flood risk maps that support the application of the sequential approach in key areas where there may be tension between development pressures and avoidance of flood risk.
- Inform, where necessary, the application of the Justification Test.
- Conclude whether measures to deal with flood risks to areas proposed for development can reduce the risks to an acceptable level while not increasing flood risk elsewhere.
- Produce guidance on mitigation measures, how surface water should be managed, and appropriate criteria to be used in the review of site-specific FRAs.

1.3 Approach to the Assessment

The purpose of this SFRA is to provide a high-level assessment of all types of flood risk in Fingal to inform strategic land use planning decisions. This report should therefore allow Fingal CC to apply the sequential approach and, where necessary, the Justification Test to identify appropriate areas / sites for development and identify how flood risk can be reduced as part of the development plan process.

A review of available flood risk information has been undertaken to identify any flooding or surface water management issues in Fingal that warrant further investigation. Based on available data, areas at risk of flooding and Flood Zones were identified in order to supplement the SEA and the development plan. The SFRA can include all levels of flood risk assessment, as described in the OPW Guidelines.

The SFRA is initially based on existing sources of information but may require the gathering of new information for all or part of the area of the development plan through a detailed flood risk assessment. Taking account of the above, a plan at county level, will not normally have to undertake detailed flood risk assessment involving the production of a flood risk map for all watercourses or coastal frontage. In general, this will only be necessary if it is intended to zone land for development or identify the location of future strategic infrastructure within flood risk areas.

Where flooding is not a major issue in the location of new development, as will be the case in many parts of the county, a less detailed approach will be required than in core urban areas with high development pressures and significant flood risk issues. The SFRA will provide more detailed information on the spatial

distribution of flood risk to enable adoption of the sequential approach and to identify where it will be necessary to apply the Justification Test. County SFRAs will contain some detailed investigation of how the sequential approach should be applied in key towns or to the identification of the location of future strategic infrastructure within flood risk areas.

Having prepared a Strategic Flood Risk Assessment and mapped Flood Zones as part of its development plan review process and any more detailed flood risk assessments as necessary, situations can arise where a planning authority will need to consider the future development of areas at a high or moderate risk of flooding, for uses or development vulnerable to flooding that would generally be inappropriate. In such cases, the planning authority must be satisfied that it can clearly demonstrate on a solid evidence base that the zoning or designation for development will satisfy the Justification Test.

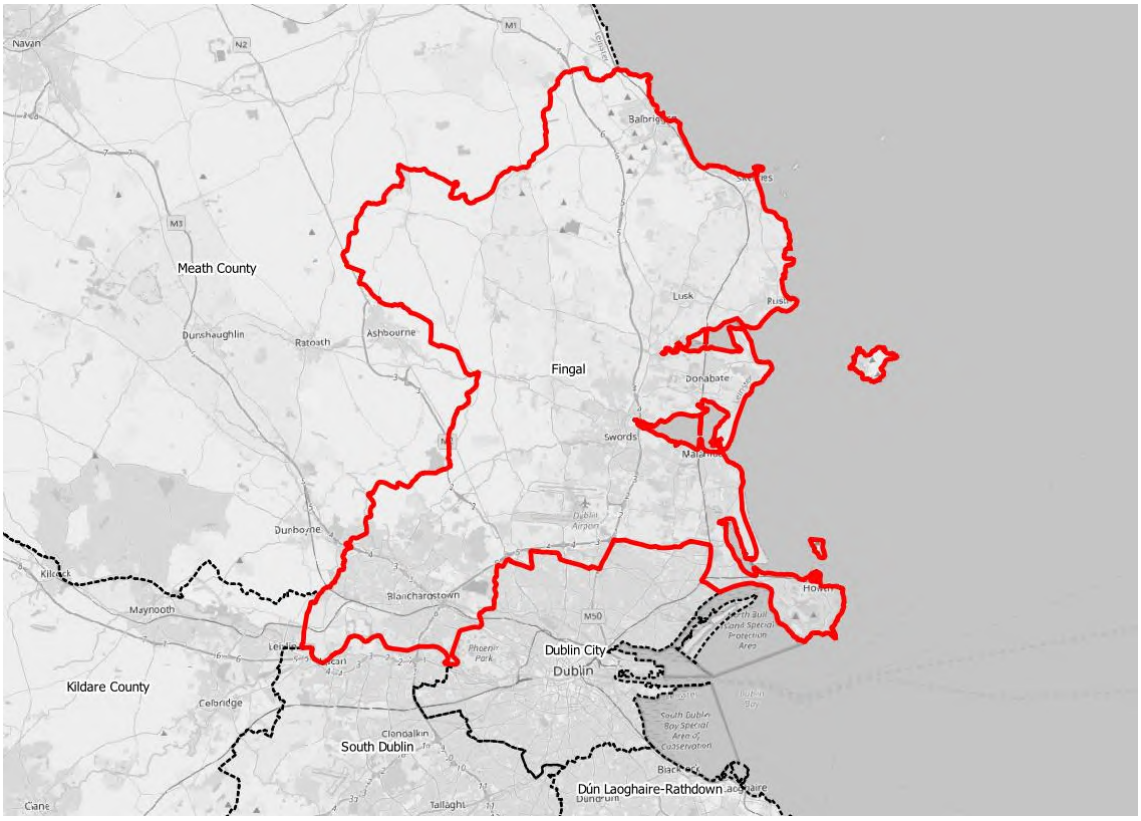
Further detail regarding the required contents of a County SFRA, as outlined in the OPW Guidelines, is included in Section 3.11.

2 PLAN AREA

2.1 Council Administrative Area

Fingal CC is one of the four council administrative areas of County Dublin. Its administrative boundary is shown in Figure 2.1. Fingal covers over 450 km^2 and is bounded to the north by the County Meath boundary, to the east by the Irish Sea, to the south by the River Liffey and the Dublin City boundary, and to the west by the County Meath and County Kildare boundaries.

Figure 2.1: Fingal County Council Administrative Boundary



2.2 Coastline and Watercourses

2.2.1 Coastline

Fingal has 88 km of coastline, extending from Balbriggan in the north to Sutton in the south. Most of this coastline comprises soft sediment, such as dunes, beaches, and soft cliffs, which are vulnerable to erosion damage caused by storms and rising sea levels. There are four estuaries along the Fingal coastline, including Rogerstown Estuary, Broadmeadow Estuary, Mayne Estuary, and North Bull Island.

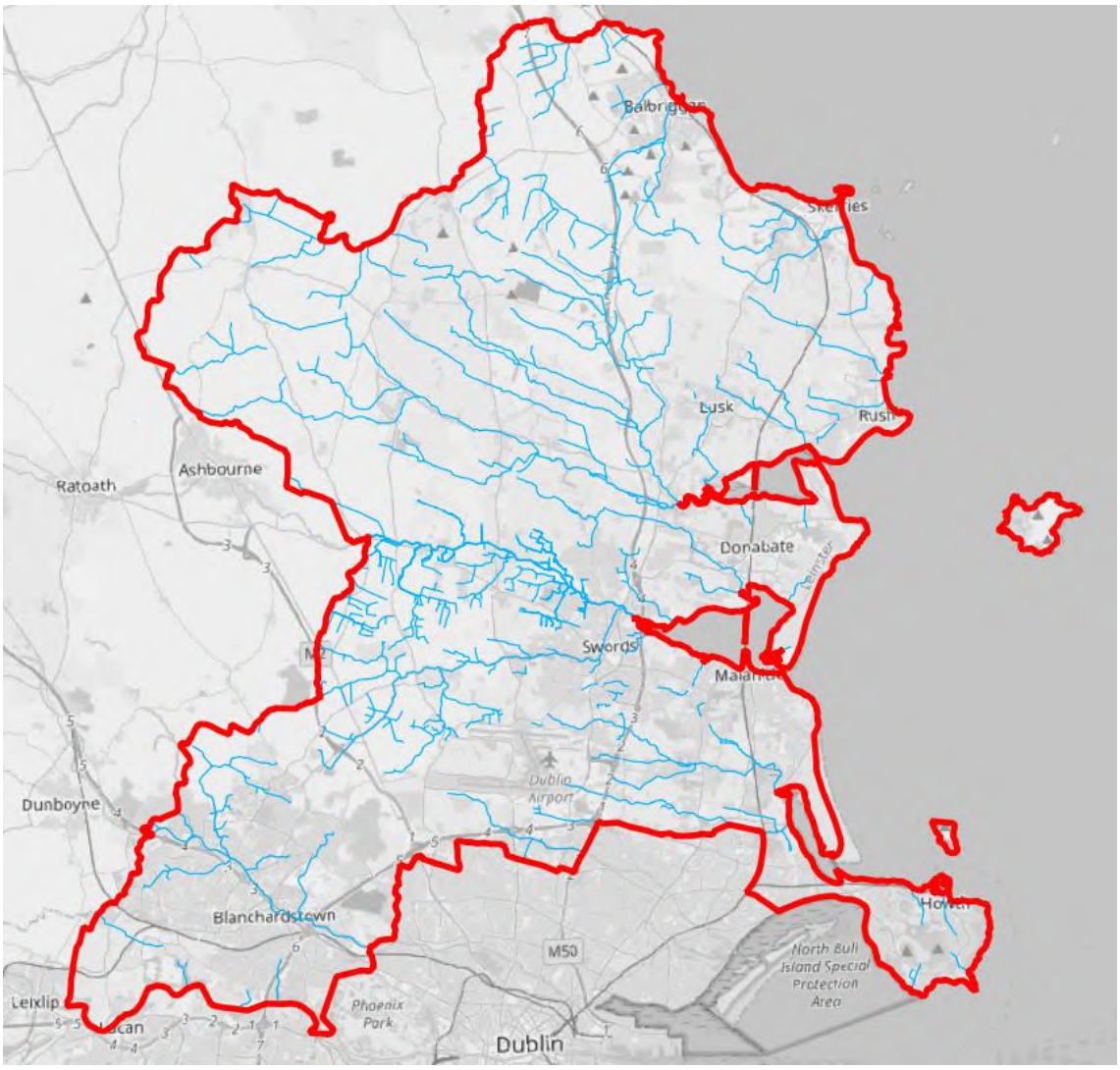
2.2.2 Watercourses

The main watercourses in Fingal include the Ward, Delvin, Tolka, Sluice, Mayne, Santry, Broadmeadow, Ballyboughal, Corduff, and Liffey. These rivers are important fisheries and wildlife resources and are important for ongoing provision of water services and for management of flood risk.

The catchments in Fingal are a mix of urban and rural (especially in the north of the county). There are large urban areas located on some of the principal rivers including Swords (Broadmeadow and Ward), Blanchardstown and Mulhuddart (Tolka).

Fingal CC have provided a GIS shapefile of watercourses within the County as shown in Figure 2.2. The dataset has been compared to EPA watercourse and OPW FSU data and the Fingal CC information has been found to be consistent and more comprehensive than both.

Figure 2.2: Map of Watercourses in Fingal



2.2.2.1 List of Watercourses

A list of named watercourses in Fingal is provided in Table 2.1. While the list is not exhaustive, it gives an indication of the extent of the river and stream network in the County. Watercourse names are generally as per Environmental Protection Agency (EPA) designations; some of the streams listed may be known locally by other names. Watercourse names are shown on flood mapping included as Appendices to the SFRA.

Table 2.1: List of Named EPA / Fingal CC Watercourses in Fingal

River	Tributary / Stream
Balcunnin	
Ballough (Stream)	• Woodpark House Branch • Bettyville • Tooman Branch
Ballyboghill / Ballyboughal	• Clonswords House Branch • Clonmethan • Drishoge Branch • Oldtown Branch / Daws River
Bracken / Matt	• Balrickard • Balrothery • Killougher • Inch Stream
Bremore	
Broadmeadow	• Skidoo • Newtown • Saucerstown • Roganstown • Mountstuart • Killossery • Rowlestown West • Mountambrose Little • Boggyheary • Laurestown • Castlefarm • Cornstown • Fieldstown • Kilcoskan
Curraghtown	
Delvin	• Gormanstown • Hodgestown • Curragh West • Heathtown
Gaybrook	
Hurley	
Liffey	• Rusk
Mayne	• Snugborough • Cuckoo Stream

River	Tributary / Stream
Mill Stream (Skerries)	• Margaretstown • Ardla stream
Palmerstown	• Rathmooney
Regles	
Santry	• Ballymun
Sluice	• Kealy's Stream • Forrest Little Stream
Staffordstown	
Tolka	• Barberstown • Powerstown • Kilmartin • Mooretown • Pinkeen • Clonee
Turvey	• Lanestown
Ward	• Brazil • Huntstown • Barberstown • Millhead • Sandyhill • Shallon • Bishopswood • Dunsoghly • Fleenstown Great • Coolatrath • Court • Coolquoy

2.2.3 Hydrometric Areas

All of the watercourses in Fingal discharge to the Irish Sea, either directly or via estuaries, and are within EPA Hydrometric Areas 08 (Nanny-Delvin) and 09 (Liffey and Dublin Bay). It is noted that coastal interbasins that drain directly to the sea, are located between Skerries and Balbriggan, east of Donabate, and south of Malahide.

2.2.3.1 Nanny-Delvin Catchment

The Nanny-Delvin catchment includes the area drained by the River Nanny (in County Meath), Delvin River, and all streams entering tidal water between Mornington Point (in County Meath) and Seamount (in Fingal). The total area drained is 711 km^2.

The largest urban centre in the Nanny-Delvin catchment is Swords. Other main urban centres in this catchment include Donabate, Lusk, Skerries, Balbriggan, Stamullin, Laytown, Bettystown, Duleek,

Ashbourne, Ratoath and Dunshaughlin. The total population within the catchment is approximately 159,230 with a population density of 224 inhabitants per km^2.

The catchment is characterised by an undulating landscape underlain mostly by impure limestones and shales with metamorphic bedrock underlying the northern part of the catchment. There are no significant sand or gravel aquifers in the catchment.

2.2.3.2 Liffey and Dublin Bay Catchment

This catchment includes the area drained by the River Liffey and all streams entering tidal water between Seamount and Sorrento Point. The total area drained is 1616 km^2.

The largest urban centre in the catchment is Dublin City. 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 with a population density of 777 inhabitants per km^2.

The Liffey and Dublin Bay catchment contains the largest population of any catchment in Ireland and is characterised by a sparsely populated, elevated land underlain by granites in the south-east and a densely populated, flat, and low-lying land underlain by limestone in the rest of the catchment.

2.3 Climate Change

Climate change is an important theme in the Fingal Development Plan 2023-2029. It is recognised that the risks associated with climate change (i.e., warmer temperatures, more extreme rainfall events, and sea level rise) will require adaptation and mitigation. It is also recognised that the nature of Fingal's economy, infrastructure (i.e., roads, electricity networks, water supply and sewer systems), settlement patterns, physical geography, and mixed land use presents a unique set of challenges in terms of the required response to climate change.

The development plan makes provisions for climate change mitigation and adaptation in areas such as flood risk management, transportation, surface water, waste management, water services, urban design, energy, natural heritage, and green infrastructure. Flood risk management challenges identified for Fingal CC include management of flood risk along both the coastline and watercourses while taking account of the predicted impacts of climate change amid increasing population pressure.

Further information and guidance relating to flood risk impact and considerations of climate change are contained in Section 3.8.

2.4 Existing Land Use Zonings

The current County Development Plan sets out 21 different land use zonings and zoning objectives, as shown in Table 2.2. The Flood Zone maps included in Appendix A were prepared to assist with future land use decisions in areas that have been assessed as being at risk of flooding.

It is envisaged that an updated set of Zoning Objectives for the Fingal Development Plan 2023-2029 will be provided prior to the final version of the SFRA.

Table 2.2: Zoning Objectives from the Fingal Development Plan 2017-2023

Zoning	Objective
CI – Community Infrastructure	Provide for and protect civic, religious, community, education, health care and social infrastructure.
DA – Dublin Airport	Ensure the efficient and effective operation and development of the airport in accordance with an approved Local Area Plan.
FP – Food Park	Provide for and facilitate the development of a Food Industry Park.
GB – Greenbelt	Protect and provide for a Greenbelt.
GE – General Employment	Provide opportunities for general enterprise and employment.
HA – High Amenity	Protect and enhance high amenity areas.
HI – Heavy Industry	Provide for heavy industry.
HT – High Technology	Provide for office, research and development and high technology / high technology manufacturing type employment in a high quality built and landscaped environment.
LC – Local Centre	Protect, provide for and / or improve local centre facilities.
MC – Major Town Centre	Protect, provide for and / or improve major town centre facilities.
ME – Metro Economic Corridor	Facilitate opportunities for high density mixed use employment generating activity and commercial development and support the provision of an appropriate quantum of residential development within the Metro Economic Corridor.
OS – Open Space	Preserve and provide for open space and recreational amenities.
RA – Residential Area	Provide for new residential communities subject to the provision of the necessary social and physical infrastructure.
RB – Rural Business	Provide for and facilitate rural-related business which has a demonstrated need for a rural location.
RC – Rural Centre	Provide for small scale infill development serving local needs while maintaining the rural nature of the cluster.
RS – Residential	Provide for residential development and protect and improve residential amenity.
RU – Rural	Protect and promote in a balanced way, the development of agriculture and rural-related enterprise, biodiversity, the rural landscape, and the built and cultural heritage.
RV – Rural Village	Protect and promote the character of the Rural Village and promote a vibrant community in accordance with an approved Local Area Plan and the availability of physical and community infrastructure.
RW – Retail Warehousing	Provide for retail warehousing development.
TC – Town and District Centre	Protect and enhance the special physical and social character of town and district centres and provide and / or improve urban facilities.
WD – Warehousing and Distribution	Provide for distribution, warehouse, storage, and logistics facilities, which require good access to a major road network.

3 APPROACH AND METHODOLOGY

3.1 Introduction

The approach and methodology adopted by this SFRA have been informed by the OPW Guidelines and associated Technical Appendices. The OPW Guidelines are therefore implemented and embedded in the context of the Fingal Development Plan 2023-2029.

3.2 Objectives and Principles of the OPW Guidelines

The SFRA recognises the core objectives of the OPW Guidelines, which are to:

- Avoid inappropriate development in areas that are at risk of flooding.
- Prevent new developments from increasing flood risk elsewhere, including flood risk that may arise from surface water runoff.
- Ensure effective management of residual risks for development permitted in floodplains.
- Avoid unnecessary restriction of national, regional, or local economic and social growth.
- Improve the understanding of flood risk among relevant stakeholders.
- Ensure that the requirements of EU and national law in relation to the natural environment and nature conservation are complied with at all stages of flood risk management.

In achieving the aims and objectives of the OPW Guidelines, Fingal CC need to:

- Adopt a sequential approach to flood risk management, which aims to avoid flood risk where possible, substitute less vulnerable uses where avoidance is not possible, and mitigate and manage the risk where avoidance and substitution are not possible.
- Apply the Justification Test for development in flood risk areas.

A precautionary approach should also be applied to flood risk management to reflect uncertainties in existing flooding datasets and risk assessment techniques and in the ability to predict the future climate, the future performance of existing flood defences, and the extent of future coastal erosion. Development should therefore be designed with careful consideration of likely future changes in flood risk, including the effects of climate change and coastal erosion, to ensure that future occupants are not subject to unacceptable risks.

3.3 Types of Flooding

Flooding is defined in the OPW Guidelines as a temporary covering by water of land not normally covered by water and as a natural process that can occur at any time in a variety of locations. Flooding can occur from different sources, acting alone or in combination, including:

- Coastal flooding (from the sea or estuaries)
- Fluvial flooding (from rivers or other watercourses)
- Pluvial flooding (from intense rainfall events and overland flow)
- Groundwater flooding (typically from turloughs in Ireland)
- Other sources (e.g., blocked drains or pipes)

3.3.1 Coastal Flooding

Coastal flooding occurs when water from the sea (along the coast or in estuaries) overflows onto adjacent land or overtops coastal flood defences where these exist. Coastal flooding is influenced by three factors, which often act in combination: high tide level, storm surges (caused by low atmospheric pressure and exacerbated by high winds), and wave action (dependent on wind speed and direction, local topography, and exposure).

3.3.2 Fluvial (River) Flooding

Fluvial flooding occurs when rivers and other watercourses burst their banks and water flows out onto the adjacent low-lying areas (the natural floodplains). This can occur where the capacity of the channel is

exceeded and / or where the channel is blocked or constrained. In estuaries, this can occur where high tide levels impede the flow of the river out into the sea.

A storm of a given rainfall depth and duration may cause flooding in one river but not in another, and some catchments may be more prone than others to prolonged rainfall or to a series of rainfall events. Changes in rainfall patterns (e.g., due to climate change) may also have different impacts on flood magnitude and frequency in different catchments. The response to rainfall events depends on factors such as the size and slope of the river and catchment, the permeability of the soil and underlying bedrock, the degree of urbanisation within the catchment, and the degree to which floodwater can be stored and slowly released by lakes and natural floodplains.

3.3.3 Pluvial (Rainfall) Flooding

Pluvial or surface water flooding occurs when the amount of rainfall exceeds the capacity of urban storm water drainage systems or the ground to absorb it. This excess water flows overland, ponding in natural or man-made hollows and low-lying areas or behind obstructions. This occurs as a rapid response to intense rainfall before the flood waters eventually enter a piped or natural drainage system. This type of flooding is driven in particular by short, intense rainfall events.

3.3.4 Groundwater Flooding

Groundwater flooding occurs when the level of water stored in the ground rises as a result of prolonged rainfall, to meet the ground surface and flows out over it, i.e. when the capacity of this underground reservoir is exceeded. Groundwater flooding tends to be very local and results from the interaction of site-specific factors such as local geology and tidal variations. While water level may rise slowly, groundwater flooding can last for extended periods of time. Hence, such flooding may often result in significant damage to property and disruption.

In Ireland, groundwater flooding is most commonly related to turloughs in the karstic limestone areas prevalent in particular in the west of Ireland.

3.3.5 Other Sources

The above causes of flooding are all natural; caused by either extreme sea levels or heavy or intense rainfall. Floods can also be caused by the failure or exceedance of capacity of built or man-made infrastructure, such as bridge collapses, from blocked or under-sized drainage systems or other piped networks, or the failure or overtopping of reservoirs or other water-retaining embankments (such as raised canals).

3.4 Definition of Flood Risk

Flooding presents a risk only when people, property, infrastructure, and / or environmental assets are located in the area that could potentially flood. Flood risk is defined as the product of the likelihood of the occurrence of a flood event and the potential consequences arising from that flood event. It is expressed as follows:

Flood Risk = Likelihood of Flooding x Consequences of Flooding

3.4.1 Likelihood of Flooding

The likelihood of flooding is defined in the Guidelines as the percentage probability of a flood of a given magnitude or severity occurring or being exceeded in any given year. It is generally expressed as a return period or as an annual exceedance probability (AEP). For example, a 1% AEP indicates the severity of a flood that has a 1 in 100 (1%) chance of occurring or being exceeded in any one year. Annual exceedance probability is the inverse of return period, as shown in Table 3.1.

Table 3.1: Return Periods and Annual Exceedance Probabilities

Return Period (Years)	Annual Exceedance Probability (%)
1	100
10	10
50	2
100	1
200	0.5
1000	0.1

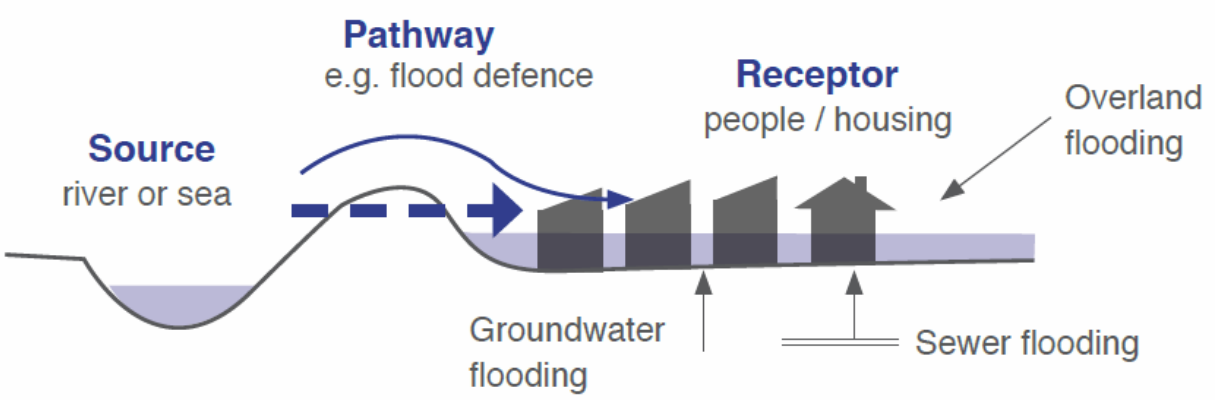
3.4.2 Consequences of Flooding

The consequences of flooding are determined by the hazards associated with the flooding (depth of water, speed, flow, rate of onset, duration, wave action, water quality) and the vulnerability of people, property, and environment assets potentially affected by a flood (age profile of the population, type of development, presence, and reliability of mitigation measures).

3.5 Source-Pathway-Receptor

The Fingal CC SFRA, in line with the OPW Guidelines, advocates the use of the Source-Pathway-Receptor model in Flood Risk Assessments (FRA) to identify the sources of flooding (e.g. high sea levels, intense or prolonged rainfall leading to increased runoff and increased flow in rivers and sewers), the people and assets impacted by flooding (receptors) and the pathways by which the flood water reaches those receptors (e.g. overland flow, river and coastal floodplains, river channels and sewers). Figure 3.1 shows the source-pathway-receptor model from the OPW Guidelines.

Figure 3.1: Sources, Pathways, and Receptors of Flooding



3.6 Flood Zones

Flood Zones are geographical areas within which the likelihood of flooding is in a particular range. The Fingal SFRA in conjunction with the OPW Guidelines defines three Flood Zones for **flooding from rivers and sea only** as indicated in Table 3.2.

Table 3.2: Flood Zones

Flood Zone	Description	Probability (Rivers)	Probability (Sea)
A	Probability of flooding from rivers and sea is highest	Greater than 1% or 1 in 100	Greater than 0.5% or 1 in 200
B	Probability of flooding from rivers and sea is moderate	Between 0.1% or 1 in 1000 and 1% or 1 in 100	Between 0.1% or 1 in 1000 and 0.5% or 1 in 200
C	Probability of flooding from rivers and sea is low (i.e., all Plan areas not in Flood Zones A or B)	Less than 0.1% or 1 in 1000	Less than 0.1% or 1 in 1000

When determining Flood Zones, the presence of flood protection structures should be ignored as areas protected by flood defences still carry a residual risk from overtopping or breach of defences.

Flood Zones are generated without inclusion of factors to allow for climate change. Therefore, land zoning based on delineated Flood Zones will not account for climate change floodplains which, in most instances, will be a wider extent than the present-day scenario.

3.7 Receptor Vulnerability

The vulnerability of development to flooding depends on the nature of the development, its occupation and the construction methods used. The classification of different land uses and types of development as highly vulnerable (including essential infrastructure), less vulnerable, and water compatible is influenced primarily by the ability to manage the safety of people in flood events and the long-term implications for recovery of the function and structure of buildings.

Zone A - High probability of flooding. Most types of development would be considered inappropriate in this zone. Development in this zone should be avoided and/or only considered in exceptional circumstances, such as in city and town centres, or in the case of essential infrastructure that cannot be located elsewhere, and where the Justification Test has been applied. Only water-compatible development, such as docks and marinas, dockside activities that require a waterside location, amenity open space, outdoor sports, and recreation, would be considered appropriate in this zone.

Zone B - Moderate probability of flooding. Highly vulnerable development, such as hospitals, residential care homes, Garda, fire, and ambulance stations, dwelling houses and primary strategic transport and utilities infrastructure, would generally be considered inappropriate in this zone, unless the requirements of the Justification Test can be met. Less vulnerable development, such as retail, commercial and industrial uses, sites used for short-let for caravans and camping and secondary strategic transport and utilities infrastructure, and water-compatible development might be considered appropriate in this zone.

In general, however, less vulnerable development should only be considered in this zone if adequate lands or sites are not available in Zone C and subject to a flood risk assessment to the appropriate level of detail to demonstrate that flood risk to and from the development can or will adequately be managed.

Zone C - Low probability of flooding. Development in this zone is appropriate from a flood risk perspective (subject to assessment of flood hazard from sources other than rivers and the coast) but would need to meet the normal range of other proper planning and sustainable development considerations.

Table 3.3: Receptor Vulnerability Classifications

Vulnerability Classification	Land Uses / Type of Development *
Highly Vulnerable Development (including Essential Infrastructure)	• Garda, ambulance, and fire stations and command centres required to be operational during flooding • Hospitals • Emergency access and egress points • Schools • Dwelling houses, student halls of residence, and hostels • Residential institutions such as residential care homes, children's homes, and social services homes • Caravans and mobile home parks • Dwelling houses designed, constructed, or adapted for the elderly or other people with impaired mobility • Essential infrastructure, such as primary transport and utilities distribution, including electricity generating power stations and sub-stations, water and sewage treatment, and potential significant sources of pollution in the event of flooding (SEVESO sites, IPPC sites, etc.)
Less Vulnerable Development	• Buildings used for: retail, leisure, warehousing, commercial, industrial, and non-residential institutions • Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans • Land and buildings used for agriculture and forestry • Waste treatment (except landfill and hazardous waste) • Mineral working and processing • Local transport infrastructure.
Water Compatible Development	• Flood control infrastructure • Docks, marinas, and wharves • Navigation facilities • Ship building, repairing, and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location • Water-based recreation and tourism (excluding sleeping accommodation) • Lifeguard and coastguard stations • Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms • Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan)

** Uses not listed here should be considered based on their own merits.*

3.8 Climate Change Adaptation

It is likely that climate change will have an impact on flood risk in Ireland as a result of rising sea levels and more frequent extreme rainfall events. There could be serious consequences for Fingal, where all of the main urban centres are located on the coast or beside watercourses. Climate change is a dynamic process that requires a precautionary and flexible approach to ensure appropriate provision for or adaptation to its potential consequences.

Guidance on climate change objectives and actions is set out in Climate Change Sectoral Adaptation Plan published by the OPW in 2019. The first Climate Change Sectoral Adaptation Plan was published in 2015 under the mandate of the National Climate Change Framework. A new plan was prepared in 2019 with

updates to the previous plan made based on new information available on climate change and its potential impacts and developments in flood risk management since 2015.

The long-term goal adopted by the OPW on climate adaptation for flooding and flood risk management is "Promoting sustainable communities and supporting our environment through the effective management of the potential impacts of climate change on flooding and flood risk." To deliver on this goal, the OPW has identified the following adaptation objectives:

- Objective 1: Enhancing our knowledge and understanding of the potential impacts of climate change for flooding and flood risk management through research and assessment
- Objective 2: Adapting flood risk management practice to effectively manage the potential impact of climate change on future flood risk
- Objective 3: Aligning adaptation to the impact of climate change on flood risk and flood risk management across sectors and wider Government policy

A number of actions have been identified under each adaptation objective across the areas of activity in flood risk prevention, protection and preparedness and resilience, as well as in further research and capacity building. Flooding has the potential to affect all sectors and local authorities, and coordination is critical towards ensuring a coherent and whole of government approach to climate resilience in relation to flooding and flood risk management.

Based on the Sectoral Adaptation Plans, the OPW adopted two indicative potential futures for flood risk assessment; the Mid-Range Future Scenario (MRFS) and the High-End Future Scenario (HEFS). These were selected to reflect, based on information available at the time, a future in the latter part of the century that would be:

- typical or near to the general average of the future climate projections (MRFS)
- a more extreme future based on the upper end of the range of projections of future climatic conditions and the impacts such changes would have on the drivers of flood risk (HEFS).

The allowances, in flood risk terms, for both the MRFS and HEFS are shown in Table 3.4. For the purposes of the SFRA, climate change flood mapping has been prepared and is included in Appendix B.

Table 3.4: OPW Climate Change Allowances

Parameter	Mid-Range Future Scenario (MRFS)	High End Future Scenario (HEFS)
Mean Sea Level Rise	+ 500 mm	+ 1000 mm
Peak River Flood Flows	+ 20%	+ 30%
Extreme Rainfall Depths	+ 20%	+ 30%

Due to the uncertainty of the potential effects of climate change, the Fingal SFRA sets out recommendations in line with the precautionary approach adopted by the Guidelines in terms of managing the effects of climate change. These include:

- Recognising that significant changes in the flood extent may result from an increase in rainfall or tide events and, accordingly, adopt a cautious approach to zoning land in transitional areas.
- Ensuring that the finished levels of structures are designed to protect against flooding such that flood defences, land raising, and ground floor levels are sufficient to cope with the effects of climate change over the lifetime of the development.
- Ensuring that both the structures designed to protect against flooding and the protected development are capable of adaptation to the effects of climate change when there is more certainty about the effects and when there is still time for such adaptation to be effective.

3.9 Stages and Scales of Flood Risk Assessment

3.9.1 Stages of FRA

Flood risk assessments are typically undertaken over three stages, in order of increasing detail, as described in Table 3.5. Progression to a more detailed stage depends on the outcomes of the previous stage. This staged approach ensures that the level of assessment undertaken is appropriate for the scale and nature of the flood risk issues, site or area, and type of development proposed. It also prevents unnecessary flood modelling and development of mitigation and management measures.

Table 3.5: Stages of Flood Risk Assessment

Stage	Purpose
Stage 1: Flood Risk Identification	To identify whether there may be any flooding or surface water management issues relevant to a plan area or proposed development site that may warrant further investigation.
Stage 2: Initial Flood Risk Assessment	To confirm sources of flooding that may affect a plan area or proposed development site and to appraise the adequacy of the existing flood risk information. If necessary, to determine what surveys and modelling approach are appropriate to match the spatial resolution required and complexity of the flood risk issues identified.
Stage 3: Detailed Flood Risk Assessment	To provide a quantitative assessment of flood risk to a proposed or existing development, the effect of the development on flood risk elsewhere, and the effectiveness of any proposed mitigation measures. Typically involves the construction of a hydraulic model that covers a wide enough area to capture catchment-wide impacts and hydrological processes.

3.9.2 Scales of FRA

There are three scales of flood risk assessment described in the OPW Guidelines, summarised in Table 3.6.

Table 3.6: Scales of Flood Risk Assessment

Scale	Purpose	Responsibility
Regional Flood Risk Appraisal (RFRA)	• To appraise the source and significance of all types of flood risk in a region based on readily derivable information to inform the regional planning guidelines and influence spatial allocations for growth in housing and employment. • To identify areas where more detailed studies are required or where flood risk management measures may be required at a regional level to support the proposed growth.	Regional Authorities

Scale	Purpose	Responsibility
Strategic Flood Risk Assessment (SFRA)	• To provide a broad assessment of all types of flood risk in the area to inform strategic land use planning decisions and to identify opportunities for reducing flood risk. • Typically involves up to a Stage 2 – Initial Flood Risk Assessment. • A site-specific flood risk assessment would be recommended where the initial flood risk assessment demonstrates the potential for a significant level of flood risk or where there is conflict with the vulnerability of proposed development.	Local Authorities
Site-specific Flood Risk Assessment (SSFRA)	• To identify and assess all types of flood risk for a proposed new development and to assess the potential effects of climate change, the impact of development on flooding, and residual risks. • To propose appropriate site management and mitigation measures to reduce flood risk to an acceptable level. • If stages 1 and 2 of assessment have been undertaken to appropriate levels of detail, it is likely that the SSFRA will require detailed channel and site surveys and flood modelling.	Planning Applicants

Further details relating to Development Management aspects of SSFRAs are outlined in Section 6.

3.10 The Sequential Approach and Justification Test

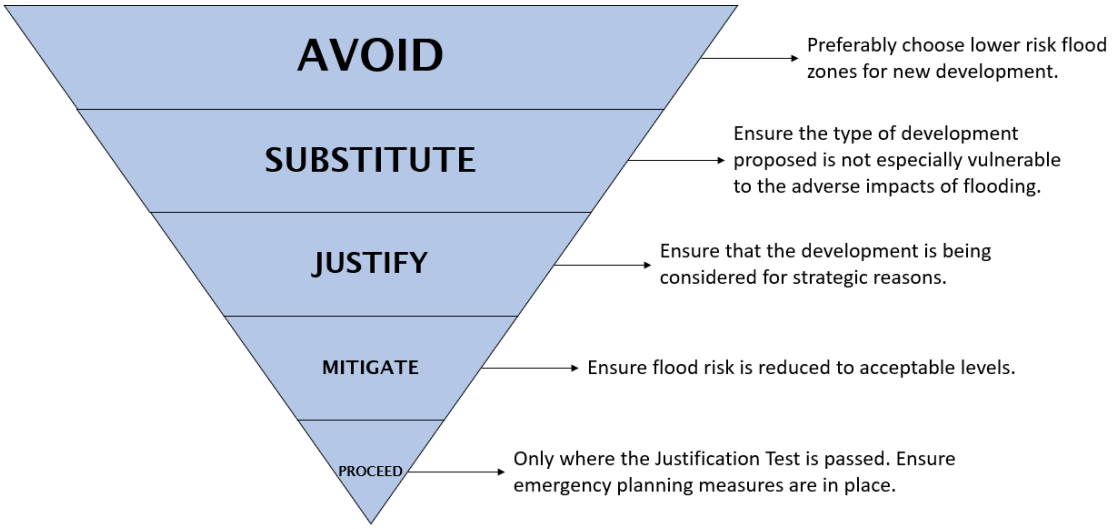
3.10.1 Sequential Approach

The OPW Guidelines recommend a sequential approach to planning to ensure the core objectives outlined in Section 3.2 are implemented. It is of particular importance at the plan making stage but is also applicable in the layout and design of development at the development management stage. The broad philosophy of the sequential approach in flood risk management from the OPW Guidelines is shown in Figure 3.2.

In general, most types of development would be considered inappropriate in Flood Zone A. In Flood Zone B highly vulnerable development (e.g., hospitals, dwelling houses and primary infrastructure) would be considered inappropriate but less vulnerable development (e.g., retail, commercial and industrial uses) might be considered appropriate. Development within Flood Zone C is appropriate from a flood risk perspective.

However, this preferred Sequential Approach is not always possible as many urban centres are affected by Flood Zones and are targeted for key social and economic development. To reflect this, the OPW Guidelines outline the Justification Test to facilitate assessment of the balance between consideration of flood risk issues and the need for continued development in towns and cities.

Figure 3.2: The Sequential Approach



3.10.2 Justification Test

The Justification Test has been designed to rigorously assess the appropriateness, or otherwise, of particular developments that, for the reasons outlined above, are being considered in areas of moderate or high flood risk. The test is comprised of two processes:

- **Plan Making Justification Test** – used at the plan preparation and adoption stage where it is intended to zone or otherwise designated land which is at moderate or high risk of flooding.
- **Development Management Justification Test** – used at the planning application state 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.

Table 3.7 is a matrix of receptor vulnerability versus Flood Zone to illustrate appropriate development and scenarios where development is required to meet the Justification Test.

Table 3.7: Vulnerability and Flood Zone Matrix for Justification Test

Development Vulnerability	Flood Zone A	Flood Zone B	Flood Zone C
Highly Vulnerable (including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less Vulnerable	Justification Test	Appropriate	Appropriate
Water-compatible	Appropriate	Appropriate	Appropriate

3.10.3 Plan Making Justification Test

The Plan Making / Development Plan Justification Test should be carried out as part of the SFRA using mapped Flood Zones. It applies where land zonings have been reviewed with respect to the need for development of areas at a high or moderate risk of flooding for uses which are vulnerable to flooding and which would generally be inappropriate, as set out in Table 3.2, and where avoidance or substitution is not appropriate. Where land use zoning objectives are being retained, they must satisfy all of the following criteria as per Table 3.4 of the OPW Guidelines included as Table 3.8.

Table 3.8: Plan Making Justification Test

No.	Criteria
1	The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans as defined above or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act, 2000, as amended.
2	The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular: • Is essential to facilitate regeneration and / or expansion of the centre of the urban settlement • Comprises significant previously developed and/or under-utilised lands • Is within or adjoining the core of an established or designated urban settlement • Will be essential in achieving compact and sustainable urban growth • There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement
3	A flood risk assessment to an appropriate level of detail has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process, which demonstrates that flood risk to the development can be adequately managed, and the use or development of the lands will not cause unacceptable adverse impacts elsewhere. N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant flood risk assessment.

In cases where existing zoned lands are discovered to be within flood zones, the Development Plan Justification Test has been applied, and it is demonstrated that it cannot meet the specified requirements it is recommended that planning authorities reconsider the zoning by implementing the following:

- Remove the existing zoning for all types of development on the basis of the unacceptable high level of flood risk
- Reduce the zoned area and change or add zoning categories to reflect the flood risk
- Replace the existing zoning with a zoning or a specific objective for less vulnerable uses
- Prepare a local area plan informed by a detailed flood risk assessment to address zoning and development issues in more detail and prior to any development

If the criteria of the Justification Test have been met, design of structural or non-structural flood risk management measures as prerequisites to development in specific areas, ensuring that flood hazard and risk to other locations will not be increased or, if practicable, will be reduced. The mitigation measures are required prior to development taking place.

3.11 Strategic Flood Risk Assessment

The purpose of this report is to carry out an SFRA at county scale for Fingal CC but also to assess particular areas of interest at closer (town / city) scale. In addition to the outputs of an SFRA outlined in Section 1.3, the following more detailed requirements are set out in the OPW Guidelines Technical Appendices and have been undertaken where relevant information is available:

- Identify principal rivers, sources of flooding and produce Flood Zone maps for across the local authority area and in key development areas.
- An appraisal of the availability and adequacy of the existing information.
- Assess potential impacts of climate change to demonstrate the sensitivity of an area to increased flows or sea levels.
- Identify the location of any flood risk management infrastructure and the areas protected by it and the coverage of flood-warning systems.

- Consider, where additional development in Flood Zone A and B is planned within or adjacent to an existing community at risk, the implications of flood risk on critical infrastructure and services across a wider community-based area and how the emergency planning needs of existing and new development will be managed.
- Identify areas of natural floodplain, which could merit protection to maintain their flood risk management function as well as for reasons of amenity and biodiversity.
- Assess the current condition of flood-defence infrastructure and of likely future policy with regard to its maintenance and upgrade.
- Assess the probability and consequences of overtopping or failure of flood risk management infrastructure, including an appropriate allowance for climate change.
- Assess, in broad terms, the potential impact of additional development on flood risk elsewhere and how any loss of floodplain could be compensated for.
- Assess the risks to the proposed development and its occupants using a range of extreme flood or tidal events.
- Identify areas where site-specific FRA will be required for new development or redevelopment.
- Identify drainage catchments where surface water or pluvial flooding could be exacerbated by new development and develop strategies for its management in areas of significant change.
- Identify where an integrated and area based provision of SUDS and green infrastructure are appropriate in order to avoid reliance on individual site by site solutions.
- Provide guidance on appropriate development management criteria for zones and sites.

4 STAGE 1 – FLOOD RISK IDENTIFICATION

4.1 Introduction

The Flood Risk Identification stage involves a review of available flood risk information and identification of any flooding or surface water management issues in Fingal that warrant further investigation. Following the guidance set out in the OPW Guidelines, both primary and secondary sources of flood risk information have been used to inform this SFRA.

4.2 Primary Sources of Flood Risk Information

Table 4.1 lists the primary sources of flood risk information in chronological order and indicates whether the source has been used to develop the Flood Zone maps produced as part of this SFRA, included in Appendix A. The source of flood data used in the SFRA flood maps is shown on maps in Appendix D. Where flood data overlaps, a precautionary / conservative approach of the maximum extent has been used.

Table 4.1: Sources of Primary Flood Information Summary

Information Source	Year Published	Flooding Type	Used for Flood Zone Mapping?
Past Flood Events Mapping	Historical / Ongoing	Various	No
River Tolka Flooding Study	2003	Fluvial	Yes (see Section 4.2.2)
Greater Dublin Strategic Drainage Study (GDSDS)	2005	Foul drainage, surface water drainage	No
Preliminary Flood Risk Assessment (PFRA)	2012	Coastal, fluvial, pluvial, groundwater	Yes
Irish Coastal Protection Strategy Study (ICPSS)	2013	Coastal	No
Fingal East Meath Flood Risk Assessment and Management Study (FEM FRAMS)	2014	Coastal, fluvial	Yes
Catchment Flood Risk Assessment and Management (CFRAM) Study	2015 / 2016	Coastal, fluvial	Yes
GSI Groundwater Flooding	2020	Groundwater	No
National Indicative Fluvial Mapping (NIFM)	2021	Fluvial	Yes
National Coastal Flood Hazard Mapping (NCFHM)	2021	Coastal	Yes
Local Area Plans (LAPs) / Masterplans	Various	Various	Varies (see Table 4.5)

4.2.1 Past Flood Event Mapping

The OPW has recorded and mapped 'Past Flood Events' based on available information including flood reports, news articles, photos, Council meeting minutes and other archived information. The record is not an exhaustive record of all flooding that has occurred in Fingal. These records have been reviewed as part of the SFRA along with historic flood event records provided by Fingal CC.

The combined set of flood records has been reviewed and any events that coincide with fluvial / coastal mapping included on SFRA Flood Zone Maps has been excluded as, for land zoning purposes, it will be considered under another study / source of data. Figure 4.1 shows the flood events not coinciding with Flood Zones / other predictive flood data, and Table 4.2 provides a description of each past flood event.

It is noted that past flood event mapping is not consistent or comprehensive and are not a component of the flood outlines used for development of Flood Zone mapping for the SFRA. Mapping of single or recurring past flood events may provide useful additional information as an indicator of a risk of flooding on land, and information on the scale and nature of flood risk in a particular location that can be used to inform site-specific flood risk assessment, but records of past flood events should not be taken as the only source of data in assessing flood risk.

Figure 4.1: Map of (filtered) Past Flood Events

Table 4.2: List of (filtered) Past Flood Events

Flood ID	Type	Location
14067	Surface Water	The Links Estate, Donabate
14068	Surface Water	Balcarrick Road, Donabate
1623	Surface Water	Whitestown Road, Rush
1649	Surface Water	Naul Road at Matt Road (West)
2183	Surface Water	Bremore, Balbriggan

4.2.2 River Tolka Flooding Study

The River Tolka Flooding Study was commissioned in 2002 by Dublin City Council, in association with Fingal County Council, Meath County Council, and the OPW, and completed in 2003. The study was an extension of the Greater Dublin Strategic Drainage Study (GDSDS) in response to a significant flood in November 2002.

Interim reports were produced to identify flood relief works for the River Tolka, such as channel regrading, embankments, and floodwalls, that could be undertaken immediately. The works were largely completed by 2009 with the exception of the replacement of Mulhuddart Bridge, which was completed in 2011. Since these flood relief works have been completed, there have been no reports of flooding from the River Tolka in the areas protected by the works.

It is noted that strategic level hydraulic modelling of the River Tolka is ongoing and flood extents will supersede the River Tolka Flooding Study at a later stage in the SFRA process.

4.2.3 Preliminary Flood Risk Assessment (PFRA)

The Office of Public Works (OPW) has developed Preliminary Flood Maps as part of the Catchment Flood Risk Assessment and Management (CFRAM) Programme. The first stage of the CFRAM process was to produce a Preliminary Flood Risk Assessment (PFRA) that included flood mapping for the entire country.

The PFRA, published by the OPW in 2012, was a national screening exercise that considered risk from coastal, fluvial, pluvial and groundwater flooding. Its purpose was to identify areas of potentially significant flood risk (Areas for Further Assessment) and to provide a scope for the Catchment Flood Risk Assessment and Management (CFRAM) programme (see Section 4.2.6).

The PFRA is a preliminary assessment only, based on available or readily-derivable information. The analysis was undertaken to identify areas prone to flooding but the analysis is indicative. Flood mapping derived is of a national / coarse scale and is not suitable for site-specific flood risk assessment. OPW has confirmed in consultation that PFRA flood mapping is superseded by more recent data sources where available (outlined in subsequent sections).

PFRA flood mapping remains the best available flood data where no CFRAM / FEM FRAM / NIFM etc. exists for those watercourses and is a component part of the flood outlines used for development of Flood Zone mapping for the SFRA.

4.2.4 Irish Coastal Protection Strategy Study (ICPSS)

The Irish Coastal Protection Strategy Study (ICPSS) was a national study commissioned by the OPW in 2003 and completed in 2013 that provided strategic-level flood hazard maps and coastal erosion maps for the Irish coastline. The purpose of the ICPSS was to support local authorities in decision-making related to how best to manage risks associated with coastal flooding and coastal erosion.

Strategic- / national-scale flood extent and depth maps were produced for 0.5% and 0.1% AEP flood events for the present day scenario and two future scenarios (i.e., the MRFS and HEFS). Aerial photographic records of the Irish coastline from 1973-75, 2000, and 2006 were used as the primary basis for coastal erosion assessment and mapping.

The ICPSS is effectively superseded by the National Coastal Flood Hazard Mapping (NCFHM) 2021 project and is not used for development of Flood Zone mapping as part of this SFRA.

4.2.5 Fingal and East Meath Flood Risk Assessment and Management (FEM FRAM) Study

The OPW developed detailed Flood Maps as part of the Catchment Flood Risk Assessment and Management (CFRAM) Programme. It is noted that the detailed flood maps are generally referred to as 'CFRAM maps' despite them being one part of the overall CFRAM programme. As a continuation of the wider CFRAM programme and to establish the approach for implementing the Floods Directive in Ireland, the OPW in conjunction with other parties commissioned a number of pilot studies.

One such pilot study was the Fingal East Meath Flood Risk Assessment and Management Study (FEM FRAMS), undertaken by Fingal County Council in partnership with Meath County Council and the OPW. The study was carried out in response to investigate the high levels of existing flood risk in the Fingal East Meath area.

The FEM FRAMS flood study involved the production of flood maps for each study area, published in 2009, covering 23 rivers and streams, three estuaries and the Fingal and Meath coastline as outlined in Table 4.3.

Table 4.3: FEM FRAMS Model Coverage

Watercourses		Estuaries
Balbriggan North Stream	Mayne River	Baldoyle Estuary
Balealy Stream	Mill Stream	Broadmeadow Estuary
Ballyboghill River	Mosney Stream (Bradden Stream)	Rogerstown Estuary
Bracken River (incl. Matt Stream)	River Nanny	
Bride's Stream	Rush Road Stream	
Broadmeadow River	Rush Town Stream	
Brookside Stream	Rush West Stream	
Corduff River	Sluice River	
Delvin River	St Catherines Stream	
Gaybrook Stream	Turvey River	
Jone's Stream	Ward River	
Lissenhall Stream		

FEM FRAMS flood models are of regional / strategic quality; flood outlines are suitable for use in Flood Zoning but not suitable for use in site specific flood risk assessment.

FEM FRAMS flood data represents best available information for the watercourses noted above and is a component part of the flood outlines used for development of Flood Zone mapping for the SFRA. FEM FRAMS flood data was provided by the OPW, via Fingal CC, and did not include climate change flood extents. Therefore, FEM FRAMS climate change data has been replicated from that shown on floodinfo.ie (MRFS data only) and included on flood maps in Appendix B.

4.2.6 Catchment Flood Risk Assessment and Management (CFRAM) Study

As part of the OPW's CFRAM programme, flood extent, depth, and risk maps (generally referred to as 'CFRAM maps') were published in 2015 / 2016 for areas identified by the Preliminary Flood Risk Assessment (PFRA) as being at potentially significant risk of flooding (see Section 4.2.3). One of the main purposes of the detailed CFRAM flood maps was to assist Local Authorities in planning and development management.

The CFRAM flood extent maps show the estimated extents, peak water levels, and peak flows associated with flooding from modelled river reaches, estuaries, and coastlines, taking account of flood defences. Flood maps were produced for a range of flood events (10%, 1%, and 0.1% AEP) for the present-day scenario and two future scenarios (the MRFS and HEFS). Flooding from other sources has typically not been considered as part of the CFRAM flood mapping.

As noted above, the majority of watercourses / waterbodies in Fingal are covered by FEM FRAMS data, where FEM FRAMS was a pilot project to the CFRAM detailed modelling phase. Table 4.4 outlines the detailed CFRAM models and associated study waterbodies relevant to Fingal that have been used to form a component part of the flood outlines used for Flood Zone mapping for the SFRA. CFRAM flood data was provided by the OPW, via Fingal CC, and did not include climate change flood extents. Therefore, CFRAM climate change data has been replicated from that shown on floodinfo.ie (MRFS and HEFS) and included on flood maps in Appendix B and Appendix C.

CFRAM flood models are of regional / strategic quality; flood outlines are suitable for use in Flood Zoning but not suitable for use in site specific flood risk assessment with an additional level of analysis.

Table 4.4: CFRAM Data for Fingal Area

CFRAM Model Location	Waterbody
Lucan to Chapelizod	River Liffey
Santry	Santry River
Sutton and Baldoyle	Mayne River / Baldoyle Estuary
Sutton and Howth North	Baldoyle Estuary / Sutton Creek / Irish Sea

4.2.7 GSI Groundwater Flood Mapping

In response to the extensive groundwater flooding that occurred in the winter of 2015 / 2016, Geological Survey Ireland (GSI) undertook the 'GWFlood' project to address the lack of data on groundwater flooding and fit-for-purpose flood hazard maps necessary to manage groundwater flood risk in vulnerable communities. Project outputs included the Groundwater Flood Maps Viewer, which shows historic and predictive (10%, 1%, and 0.1% AEP) groundwater flood extents, a Groundwater Level Data Viewer, which shows live groundwater hydrometric data, and a comprehensive project report.

GSI Groundwater Flooding Probability Maps do not show any risk of flooding from groundwater within the Fingal CC area. Groundwater flooding is not considered further in the SFRA or Flood Zone mapping.

4.2.8 National Coastal Flood Hazard Mapping (NCFHM)

The National Coastal Flood Hazard Mapping (NCFHM) 2021 project was prepared and published by the OPW Coastal and Flood Risk Management Data Management Sections.

The aim of this project is to produce updated national scale coastal flood extent and depth maps for the 50%, 20%, 10%, 5%, 2%, 1%, 0.5% and 0.1% Annual Exceedance Probabilities (AEPs) for the present day scenario and for the Mid-Range Future Scenario (MRFS) and High End Future Scenario (HEFS) which represent a 0.5m and 1.0m increase in sea level respectively (as well as two more extreme high end scenarios which are outside the scope of this assessment).

The maps prepared are predictive, as they provide predicted flood extent and depth information for a 'design' flood event that has an estimated probability of occurrence (e.g., the 0.5% AEP event), rather than information for floods that have occurred in the past.

The maps have been produced at a strategic / national level to provide an overview of coastal flood hazard in Ireland, and minor or local features may not have been included in their preparation. Flood outlines are suitable for use in Flood Zoning but not suitable for use in site specific flood risk assessment.

NCFHM flood data represents best available information for flooding from coastal sources and is a component part of the flood outlines used for Flood Zone mapping for the SFRA. NCFHM data is also used in SFRA MRFS / HEFS climate change flood mapping.

4.2.9 National Indicative Fluvial Mapping (NIFM)

The National Indicative Fluvial Mapping (NIFM) was released by the OPW in 2021. It shows the extent of flooding from modelled river reaches for catchments greater than 5 km^2 in areas that were not previously mapped as part of the CFRAM programme or FEM FRAMS study. Flood mapping was prepared for a range of flood events (5%, 1%, and 0.1% AEP) for the present-day scenario and two future climate change scenarios (the MRFS and HEFS).

NIFM User Guidance Notes state that the maps only provide an indication of areas that may be prone to flooding. They are not necessarily locally accurate and should not be used as the sole basis for defining the Flood Zones nor for making decisions on planning applications. They are by definition of a national indicative quality.

Flood outlines are suitable for use in the Stage 1 Flood Risk Assessment and initial Flood Zone mapping but not suitable for use in site specific flood risk assessment. Where a land zoning allocation is being considered within or adjacent to an initial Flood Zone defined by NIFM flood extents then additional data / information source will be required to form the basis of a Stage 2 Flood Risk Assessment.

NIFM flood data represents best available information for flooding from fluvial sources where no more detailed regional or local-quality data exists, is a component part of the flood outlines used for Flood Zone mapping for the SFRA. NIFM data is also used in SFRA MRFS / HEFS climate change flood mapping.

4.2.10 Local Area Plans (LAPs) and Masterplans

Local Authorities prepare Local Area Plans (LAPs) and Masterplans (MPs) to outline their policies and objectives for land use and development management in local areas over a six-year period. LAPs and MPs generally include flood risk information in the form of a Strategic Flood Risk Assessment (SFRA).

Table 4.5 outlines the active / adopted LAPs / MPs in the County. Where flood data is known to have been developed to supplement that LAP / MP (and local zoning / land allocations) then that flood data is carried forward to the County SFRA to ensure consistency of approach. LAP and MP boundaries are indicated on SFRA Flood Zone Maps for ease of reference.

Where a flood risk assessment / flood mapping has been developed to support an LAP / MP, the approach to flood mapping varies across the various plans. LAP SFRAs consider flooding from a range of sources including local consideration of surface water, urban drainage, infrastructure failure etc. Local data other than river and coastal flooding is not included on SFRA mapping and reference should be made to the LAP / MP for detail.

Flood outlines where available vary from a regional / indicative quality to local quality and are suitable for use in Flood Zoning but not suitable for use in site specific flood risk assessment. LAP and MP flood data represents best available information for flooding from fluvial sources and (where available) is a component part of the flood outlines used for Flood Zone mapping for the SFRA. Data is also used in SFRA MRFS / HEFS climate change flood mapping where available.

Table 4.5: Local Area Plan / Masterplan Flood Data Summary

Local Area Plan / Masterplan	Flood Data used for Flood Zoning?	Flood Data used for Climate Change Mapping?
Baldoyle Stapolin LAP 2013, extended to 2023	No	No
Ballyboughal LAP 2012, extended to 2022	No	No
Barnhill LAP 2019	Yes	Yes (MRFS only)
Castlelands Masterplan, March 2021	Yes	Yes
Cherryhound LAP 2012, extended to 2022	No	No
Dardistown LAP 2012, extended to 2022	No	No
Donabate LAP 2016, extended to 2026	N/A (LAP based on FEM FRAMS / CFRAM data)	N/A (LAP based on FEM FRAMS / CFRAM data)
Dublin Airport, 2020	Yes	No
Kellystown LAP 2021	N/A (Pluvial flooding only)	N/A (Pluvial flooding only)
Kilmartin LAP 2013, extended 2023	No	
Kinsaley LAP 2019	No [1]	No [2]
Oldtown LAP 2012, extended to 2022	No	No
Portmarnock South 2013, extended to 2023	No	No
Rivermeade LAP 2018	No	No
Swords Masterplans, June 2019 (includes Barrysparks & Crowscastle, Fosterstown & Estuary West)	No [1]	No [2]

[1] Flood data not included on initial SFRA Flood Zone mapping due to an identified geolocation error. To be corrected in a later revision.
[2] Flood data not included on initial SFRA CC mapping due to an identified geolocation error. To be corrected in a later revision.

4.3 Secondary Sources of Flood Risk Information

4.3.1 Greater Dublin Strategic Drainage Study (GDSDS)

The GDSDS was commissioned in 2001 to carry out a strategic analysis of the existing foul and surface water systems in the local authority areas of Dublin (including Fingal CC) and adjacent catchments. The objectives of the study were to identify policies, strategies, and projects for the development of a Sustainable Drainage Systems (SuDS) for the Greater Dublin region.

The GDSDS provides information related to the hydraulic performance and future needs of the foul and stormwater sewer systems at the time of its publication.

4.3.2 OPW Drainage Districts

Drainage Districts were carried out by the Commissioners of Public Works under a number of drainage and navigation acts from 1842 to the 1930s to improve land for agriculture and to mitigate flooding. Channels and lakes were deepened and widened, weirs removed, embankments constructed, bridges replaced or modified, and various other work was carried out.

The purpose of the schemes was to improve land for agriculture, by lowering water levels during the growing season to reduce waterlogging on the land beside watercourses known as callows. Drainage Districts cover approximately 10% of the country, typically the flattest areas.

Benefited land is land that was drained as part of the Drainage District. The original maps also identified other land owned by the same landowner so as to calculate the appropriate charge for maintenance. Local authorities are charged with responsibility to maintain Drainage Districts. The Arterial Drainage Act, 1945 contains a number of provisions for the management of Drainage Districts in Part III and Part VIII of the act.

Drainage Districts are areas that Local Authorities have a responsibility to maintain. One 'Drainage District', for which Fingal CC have maintenance responsibility, is located along a stretch of the Delvin River near Garristown.

4.3.3 OPW Arterial Drainage Schemes

Arterial Drainage Schemes were carried out under the Arterial Drainage Act, 1945 to improve land for agriculture and to mitigate flooding. Rivers, lakes weirs and bridges were modified to enhance conveyance, embankments were built to control the movement of flood water and various other work was carried out under Part II of the Arterial Drainage Act, 1945.

The purpose of the schemes was to improve land for agriculture, to ensure that the 3-year flood was retained in bank this was achieved by lowering water levels during the growing season to reduce waterlogging on the land beside watercourses known as callows. Flood protection in the benefiting lands was increased as a result of the Arterial Drainage Schemes.

Three primary 'Arterial Drainage Schemes', that the OPW has a duty to maintain, are located within Fingal:

- The Matt River and its tributaries from Ring Commons / Junction 5 on the M1 to Balbriggan
- The Ward River and its local tributaries from the Co. Meath border to the Broadmeadow River in Swords
- The Broadmeadow River and its local tributaries from the Co. Meath border through Swords to the Irish Sea

4.3.4 Fingal CC Flood Defence Data

A number of datasets available to Fingal CC containing information relating to existing flood defences have been reviewed in order to inform the SFRA. Datasets are summarised in the following sections. In general, the datasets provided show locations and standard of protection of defences, but not further details relating to nature or condition.

The information provided to date is considered sufficient for a Stage 1 FRA and benefitting areas are included on Flood Zone Maps. However, for the purposes of Stage 2 assessment of any proposed land zonings, further detail on flood defences and benefiting will be required.

It is noted that in some areas, where standard of protection details are not provided, 'areas requiring further consideration' are marked on Flood Zone Maps.

Proposed flood relief schemes are discussed in Section 4.3.5.

4.3.4.1 OPW Benefitting Areas

OPW via Fingal County Council has provided data described as 'Benefitting Areas Fingal' relating to areas along the River Tolka (Littlepace, Herbert Road, Mulhuddart, Clonee and Westpoint Business Park). The five areas are shown to benefit to a 100-year (1% AEP) standard of protection.

From review of available data, the benefitting areas are based on Flood Zone A (1% AEP flood event) of the Tolka Flood Study, summarised in Section 4.2.2 and as such, greater flood scenarios (0.1% AEP and MRGS / HEFS) are assumed to not be protected by the defences.

Benefitting areas are indicated on Flood Zone maps. It is noted that River Tolka flood defences will be subject to review as part of the update to Tolka hydraulic model and flood extents being undertaken at a later stage in the SFRA process.

4.3.4.2 SFRA Defended Areas

Fingal County Council has provided data described as 'SFRA Defended Areas'. That data includes defended areas not included on the OPW data (Section 4.3.4.1) relating to the following:

- Portmarnock / Malahide Golf Club, indicated to have a 200-year (0.5% AEP) standard of protection.
- Turvey River and River Pill in Donabate indicated to have a 200-year (0.5% AEP) standard of protection.
- An area in south Skerries indicated to have a 200-year (0.5% AEP) standard of protection.
- A section of the Broadmeadow River in Rolestown indicated to have a 100-year (1% AEP) standard of protection.

From review of available data, the benefitting areas are based on FEM FRAMS / CFRAM flood data. Benefitting areas are indicated on Flood Zone maps.

4.3.4.3 Donabate LAP Data

Data informing Donabate Local Area Plan (LAP) includes information in relating to benefitting areas at the following:

- Adjacent to Balcarrick Golf Club
- To the north west of the National Forensic Mental Health Service
- In the vicinity of Donabate Community College
- Along Donabate Beach

The data includes no information in relation to a Standard of Protection. Benefitting areas are indicated on Flood Zone maps but marked as 'areas requiring further consideration' to reflect the lack of key data.

4.3.5 Proposed OPW Flood Relief Schemes

Areas that benefit from an existing flood relief scheme or flood defences have a reduced probability of flooding but can be particularly vulnerable due to the speed of flooding when overtopping or a breach or other failure takes place.

The Office of Public Works (OPW) is responsible for leading and coordinating the implementation of localised flood relief schemes to provide flood protection for cities, towns, and villages, either directly or in association with relevant Local Authorities.

The OPW, through consultation undertaken as part of the SFRA, have requested that Fingal CC have full regard to the proposed flood relief schemes in four areas as outlined in the following sections.

4.3.5.1 Skerries (Mill Stream) Flood Relief Scheme

The proposed Skerries Flood Relief Scheme may include construction of hard defences (embankments & flood walls), culvert removal and the upgrade of three access bridges and is expected to provide protection against an estimated 100-year fluvial flood (1% Annual Exceedance Probability) and a 200-Year flood (0.5% Annual Exceedance Probability) tidal event.

The scheme has not been implemented at the time of preparation of the SFRA, and SFRA Flood Zone mapping does not include any associated benefitting area.

4.3.5.2 Malahide Flood Relief Scheme

The proposed Malahide Flood Relief Scheme may include, rehabilitating and raising existing coastal defences, construction of flood defence embankment on the Sluice River. Construction of demountable flood defences at railway underpass along with embankments. It was initiated as part of the FEM FRAMS study and subsequent CFRAM process. Studies are ongoing to identify a scheme that is expected to provide protection against a 100-year flood (1% AEP) for fluvial flooding.

The scheme has not been implemented at the time of preparation of the SFRA, and SFRA Flood Zone mapping does not include any associated benefitting area.

4.3.5.3 *Portmarnock (Strand Road) Flood Relief Scheme*

The proposed Portmarnock Flood Relief Scheme may include, rehabilitating and raising existing coastal defences, construction of a flood defence embankment and construction of demountable flood defences. Studies are ongoing to identify a scheme that is expected to provide protection against a 100-year flood (1% Annual Exceedance Probability) for fluvial flooding.

The scheme has not been implemented at the time of preparation of the SFRA, and SFRA Flood Zone mapping does not include any associated benefitting area.

4.3.5.4 *Sutton and Howth North Flood Relief Scheme*

The Sutton and Howth North Flood Relief Scheme was one of the main schemes identified by the CFRAM programme. It will be progressed in the future with funding under the OPW's flood relief capital works programme. The proposed scheme for Sutton and Howth North that may be implemented after project-level assessment and planning or exhibition and confirmation may include a combination of wave return walls and flood defence walls with an average and maximum height of 1.1 m and 2.4 m, respectively.

The scheme has not been implemented at the time of preparation of the SFRA, and SFRA Flood Zone mapping does not include any associated benefitting area.

4.3.6 Rogerstown Coastal Flood and Erosion Risk Management (CFERM) Study

Managing erosion of the dunes and beaches at Rush and Portrane is a priority for Fingal CC as many homes are at risk. The Rogerstown Coastal Flood and Erosion Risk Management (CFERM) Study was carried out in 2019 as part of an optioneering process to appraise coastal management options and determine preferred options for the Rogerstown Estuary area, which includes the Rush North and Rush South beaches and the Burrow peninsula.

The preferred options were beach nourishment and flood defences (groynes) for the Burrow peninsula (specifically along Portrane Beach), flood defences (seawalls and flood gates) for Rush South to protect Spout Road and Channel Road in particular, and no active intervention for Rush North given the limited erosion and flood risk at this beach. These options require extensive environmental assessment before progressing to the planning process.

SFRA Flood Zone mapping does not include any associated benefitting area.

4.3.7 Impoundments

4.3.7.1 *Royal Canal*

The Royal Canal extends 146 km from Dublin to the River Shannon. It rises through a series of locks, reaching its peak level near Mullingar before descending to join the Shannon at Richmond Harbour. Work on constructing the canal was completed in 1817. The canal was closed in 1961 and, following extensive restoration work, was reopened in 2010 for navigation.

Waterways Ireland is the cross-border navigation authority responsible for the management, maintenance, and development of seven inland navigable waterways, including the Royal Canal. Water levels in the canal are controlled, and the infrastructure is subject to regular monitoring and maintenance by Waterways Ireland.

The Royal Canal sits lower than the surrounding ground for most of its length through Fingal. A stretch of canal, approximately 2.5 km from Westmanstown to the Co. Kildare border, sits higher than the surrounding ground. In the event of overtopping or failure of the embankment along this stretch of canal, floodwater would pose a risk to the surrounding, lower-lying land.

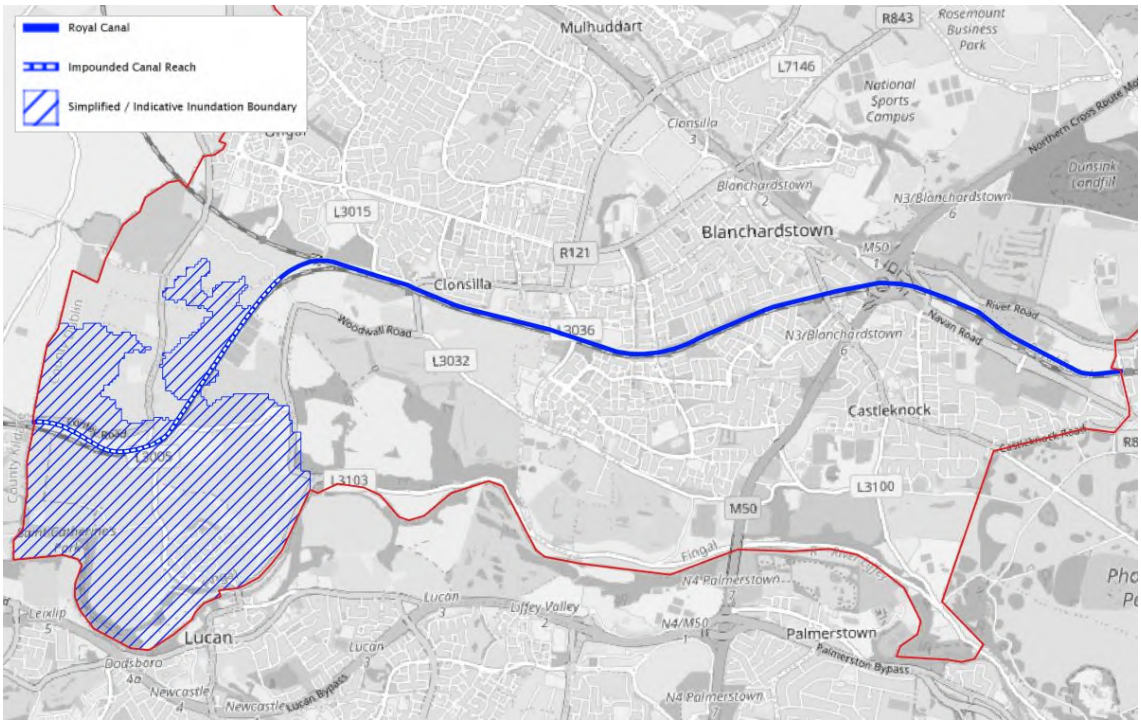
While not a matter for determination of Flood Zones, site-specific FRAs in this area should take account of the potential risk of flooding due to canal / impoundment breach.

The scope or remit of this SFRA does not extend to inundation modelling. A simple and rationalised assessment has been undertaken to determine lands on flowpaths and elevations where floodwater could tend to flow onto in the event of a breach of the impoundment.

Figure 4.2 shows the Royal Canal, highlighting the extent where the waterbody is impounded where local topography generally falls towards the River Liffey. South of the canal, a simplified inundation extent is determined by a "water drop" flow path and catchment analysis between upstream and downstream impounded limits. Height data is limited to Ordnance Survey Ireland (OSI) 25 m height data. North of the canal, a simplified flood extent is determined based on all adjacent land that is impounded by the canal up to the estimated water level (56.5 mOD).

The analysis is indicative in nature. Where a Zoning allocation is being considered within or adjacent to an initial Flood Zone defined by NIFM flood extents then it is recommended that a Stage 2 Flood Risk Assessment will be required.

Figure 4.2: Possible Inundation Area of the Royal Canal



4.3.7.2 *Reservoirs and Dams*

Potential impounding (storage) reservoirs and service reservoirs either in Fingal or that drain into Fingal were identified using Ordnance Survey Ireland (OSI) mapping and the EPA's Water Framework Directive dataset of lake segment polygons. Figure 4.3 shows a map of those reservoirs assessed as being potential sources of flood risk in the event of an uncontrolled release of water due to infrastructure failure. Table 4.6 lists these reservoirs in Fingal.

Further work is ongoing at the time of preparation of this draft to determine further details relating to the reservoirs and define likely risks associated. An approach to management of risk through land zoning application and development control is to be determined in consultation with Fingal CC.

Figure 4.3: Map of Reservoirs / Impounded Lakes in Fingal

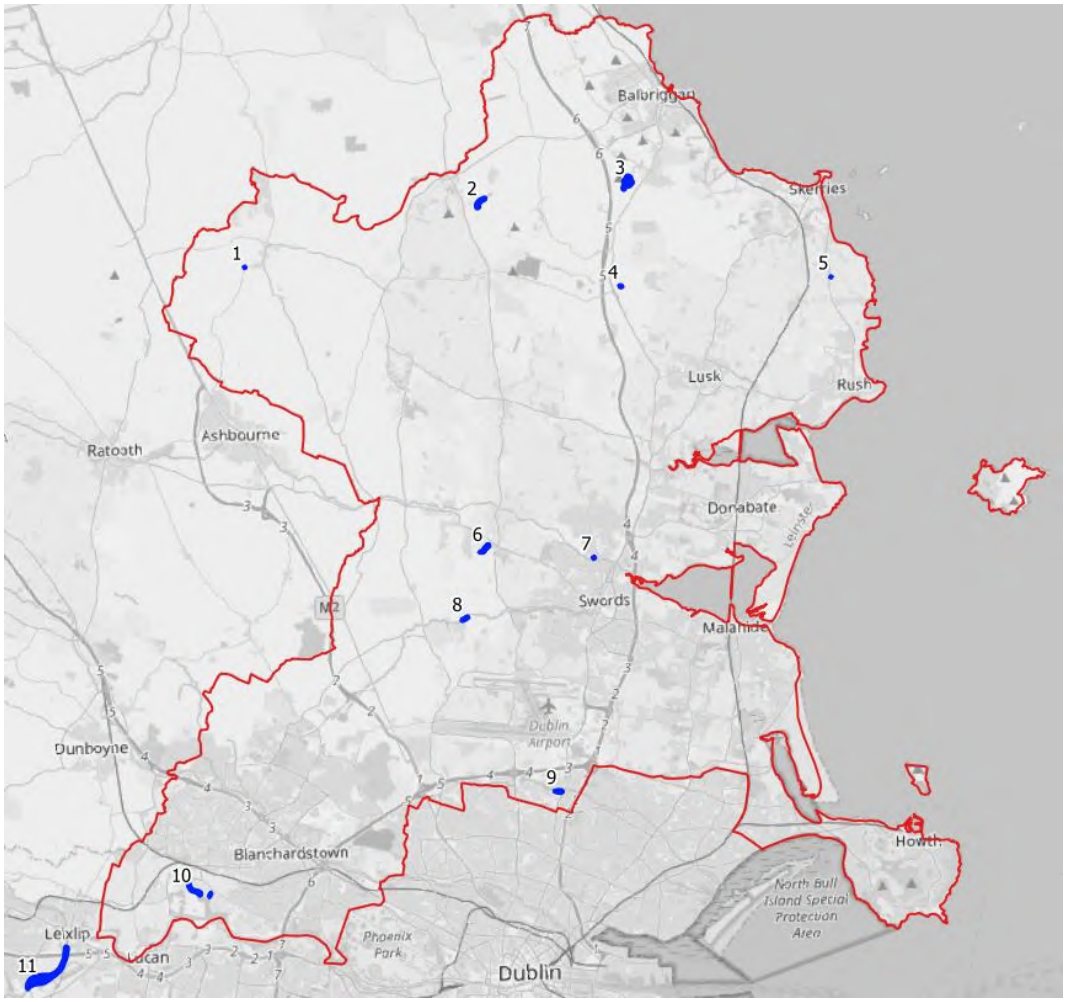


Table 4.6: List of Impounded Lakes / Reservoirs in Fingal

ID	Location / Name	Location / Description	Ownership
1	South-west of Garristown	Service reservoir	TBC
2	Naul / Lecklinstown Reservoir and Dam	Impounded Reservoir	TBC
3	Wavin Lakes (south-west of Balbriggan)	Impounded Reservoir	TBC
4	Jordanstown	Service reservoir	TBC
5	Thomastown Service Reservoir	Service reservoir	TBC
6	Portraine Asylum Reservoir and Dam	Impounded Reservoir	TBC
7	Swords Celtic Football Club	Service reservoir	TBC
8	Westereave Lake	Impounded Reservoir	TBC

ID	Location / Name	Location / Description	Ownership
9	River Santry at Swords Road, Santry Park	Impounded Reservoir	TBC
10	Luttrellstown Golf Course Lakes	Impounded Reservoir	TBC
11	Leixlip Reservoir and Hydro Dam	Impounded Reservoir	TBC

4.4 Summary

In accordance with the OPW Guidelines, the flood information sources within Fingal have been identified. The findings of the Stage 1 assessment indicate that lands within the County are at risk of flooding. Therefore, in accordance with the OPW Guidelines, a Stage 2 flood risk assessment, including Justification Test, should be carried out.

Table 4.7: Stage 1 Flood Risk Assessment Summary

Source / Pathway		Relevant to Fingal CC Area?	Reason
Coastal		Yes	Flood mapping indicates that areas within Fingal are affected by coastal flooding.
Fluvial	**Natural Floodplain**	Yes	Flood mapping indicates that areas within Fingal are affected by coastal flooding.
	Flood Defence Failure	Yes	There are a number of flood defences benefitting lands in parts of Fingal.
Pluvial / Surface Water		Yes	Pluvial flooding is likely to be a significant risk in discrete areas throughout the County; however insufficient data is available to allow any spatial analysis of pluvial flood risk.
Urban Drainage		Possible	Flooding from urban drainage networks is likely to cause a significant risk developed / built up areas where extreme rainfall can overwhelm drainage network capacity.
Groundwater		No	GSI Groundwater Flood Mapping indicates that the Fingal area is not at significant risk of groundwater flooding.
Reservoirs / Canals / Artificial Sources		Yes	Impoundments have been identified associated with part of the Royal Canal and a number of other lakes, reservoirs and service reservoirs that may cause a localised flood risk in the event of overtopping or failure.

5 STAGE 2 – INITIAL FLOOD RISK ASSESSMENT

5.1 Introduction

A Stage 2 SFRA (initial flood risk assessment) was undertaken to:

- Confirm the sources of flooding that may affect lands within Fingal CC
- Appraise the existing land zonings relative to the Stage 1 flood data / Flood Zone Maps
- Provide clarification on the requirement for a site-specific FRA and Justification Test, based on the proposed use and associated vulnerability of a land zoning

5.2 Justification Tests

5.2.1 Existing Land Zonings

The zoning objectives within key settlement areas have been reviewed as part of the Stage 2 assessment. The review, outlined in the following sections, will apply a Plan-Making Justification Test (as outlined in Section 3.10.3) for lands shown to be at risk of flooding as well as comment on the source / nature of flood risk where necessary.

It is noted that land zonings are as per the previous (2017-2023) County Development Plan so the following area-specific assessments are subject to change in future revisions of the SFRA.

5.2.2 Proposed Land Zonings

As part of the SFRA process to date, McCloy Consulting has undertaken the following:

- Review of Councillors' flood risk related text motions with feedback provided to Fingal CC Water Services and Planning staff.
- Review of all Councillors' land based zoning motions relative to Flood Zone Maps providing statement as to whether proposed zonings are in Flood Zone A, Flood Zone B and / or Flood Zone C.

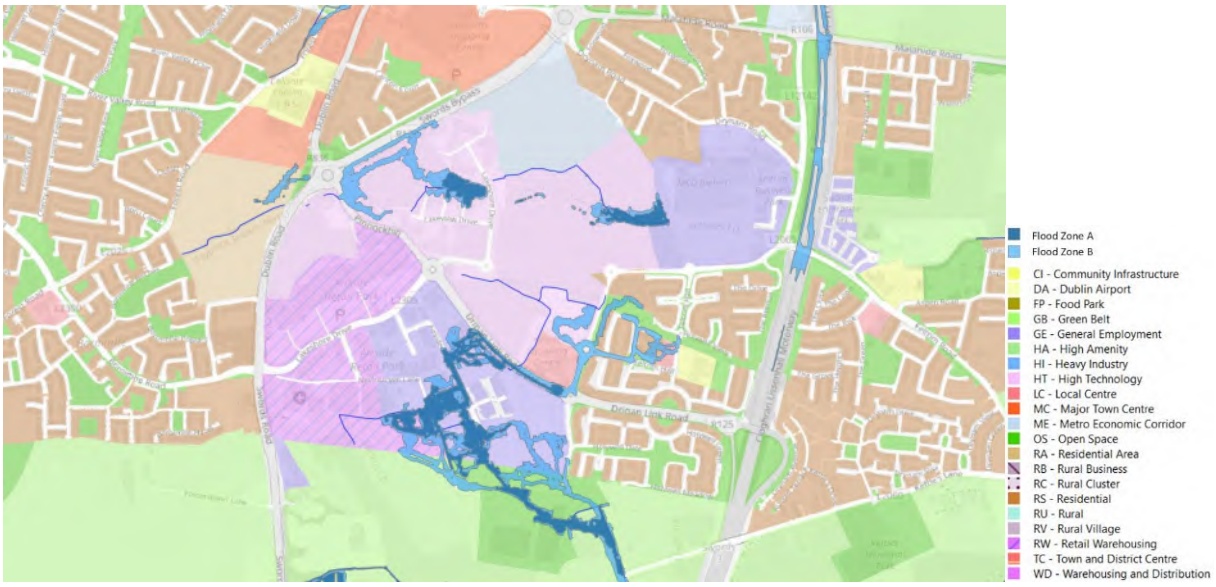
This feedback has been provided to and discussed with Fingal CC Water Services and Planning staff to aid the initial stage of land zoning / County Development Plan decisions.

5.2.3 Future Land Zonings

As stated above, the following sections include settlement area reviews and Justification Tests for the previous (2017-2023) County Development Plan land zonings at this 'draft' stage. Following public consultation and review of submissions, the settlement area summaries and Justification Tests will be updated to inform all land use zonings for the 2023-2029 County Development Plan.

This process will include consideration of the specific land use zoning objectives and flood risk will be presented for the settlements. Comment will be provided on the use of the sequential approach and Justification Test. Recommendations will be presented on how flood risk is proposed to be managed within the settlement.

5.2.4 Airside Retail Park



Flood Zone Data Source(s)	Swords Masterplan SFRA
Criteria 1	Airside retail park is a commercial and industrial area to the south of Swords town. It is a long-established area and fairly well developed.
Criteria 2	The existing zoning remains compatible with the long-established use and existing residential developments.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (Swords Masterplan SFRA) is considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.5 Balbriggan

Flood Zone Data Source(s)	FEM FRAMS
Criteria 1	Balbriggan is a coastal town in the north of the county It is a long-established area and fairly well developed.
Criteria 2	The existing zoning remains compatible with the long-established use and existing residential developments.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (FEM FRAMS) is considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.6 Balgriffin

Flood Zone Data Source(s)	FEM FRAMS
Criteria 1	Balgriffin is a newly established area with a large number of existing houses. It is located near the Fingal / Dublin City boundary.
Criteria 2	No other land is suitable.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (FEM FRAMS) is considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.7 Balheary

Flood Zone Data Source(s)	FEM FRAMS
Criteria 1	Balheary is a well-established industrial area that provides local employment north of Swords. The zoning provides for mixed use. In accordance with the Regional Planning Guidelines, retention of existing enterprises and promotion of new local employment opportunities, in conjunction with other uses, will be encouraged.
Criteria 2	The area is already well-established, and the zoning is considered necessary to facilitate the current overall zoning, which is accessible from the M1, R132, and central Swords. No other lands are available.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (FEM FRAMS) is considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

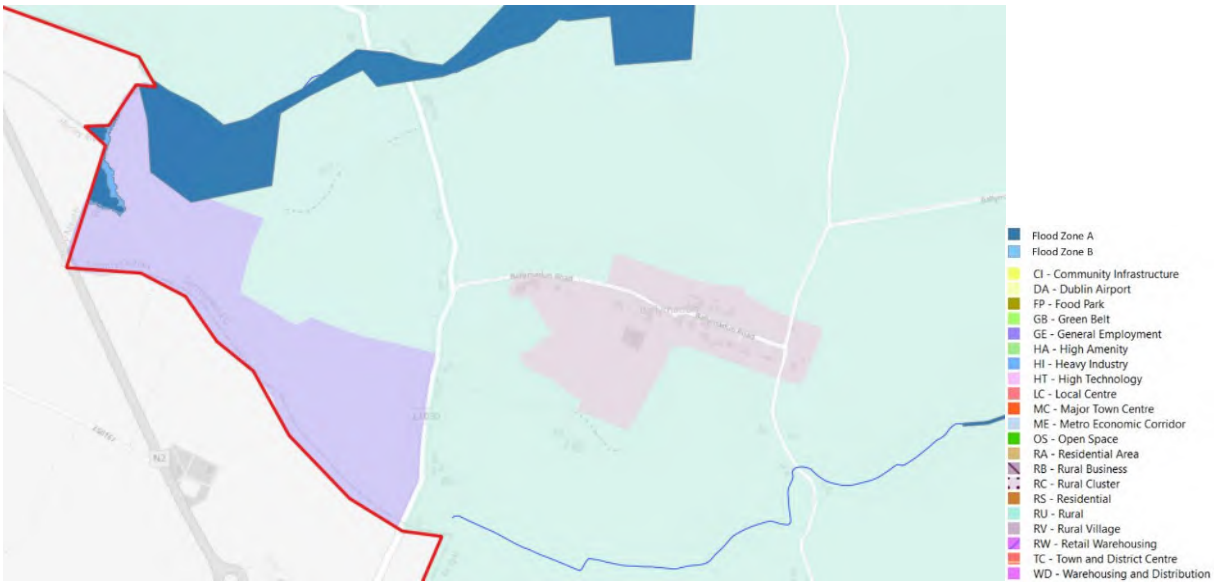
5.2.8 Ballough

Flood Zone Data Source(s)	NIFM
Criteria 1	Ballough is a Rural Cluster located west of Lusk and north of the existing Ballough Rural Business area. The lands are accessible from a county road in close proximity to the junction with the R132 Regional Road to Balbriggan.
Criteria 2	The zoning is considered appropriate.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (NIFM) is not considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.9 Ballyboughal

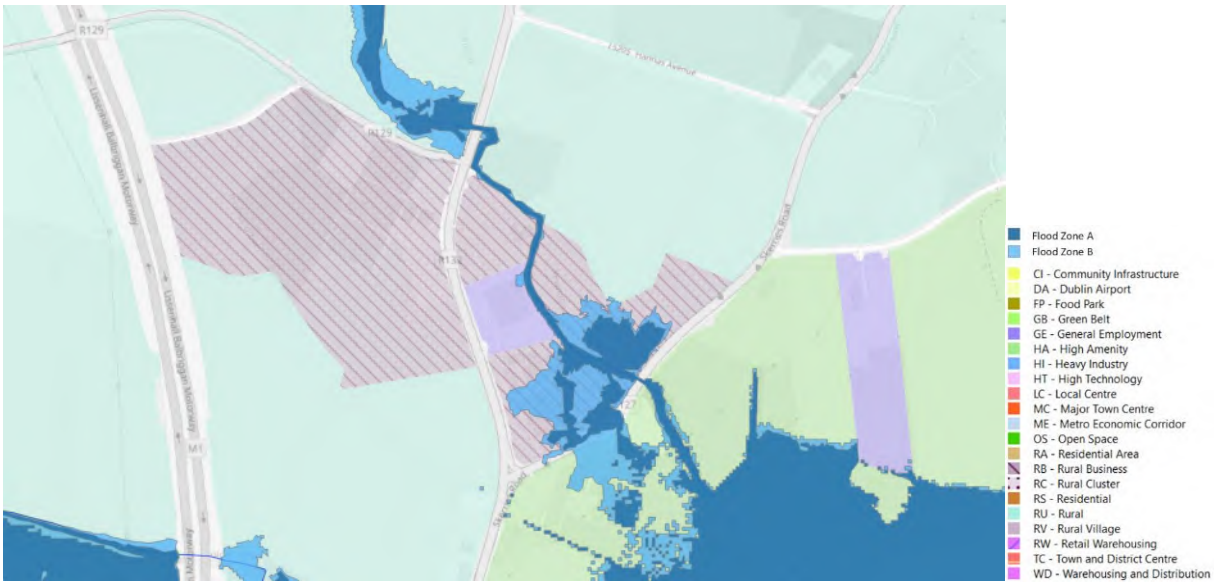
Flood Zone Data Source(s)	FEM FRAMS
Criteria 1	Ballyboughal is a small rural village. The current LAP allows for development of the village, in accordance with Regional Planning Guidelines.
Criteria 2	The area is at the centre of Ballyboughal and is essential to facilitate the expansion of the centre of the settlement. The area is also at the centre of the LAP lands. No other lands are suitable.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (FEM FRAMS) is considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.10 Ballymadun



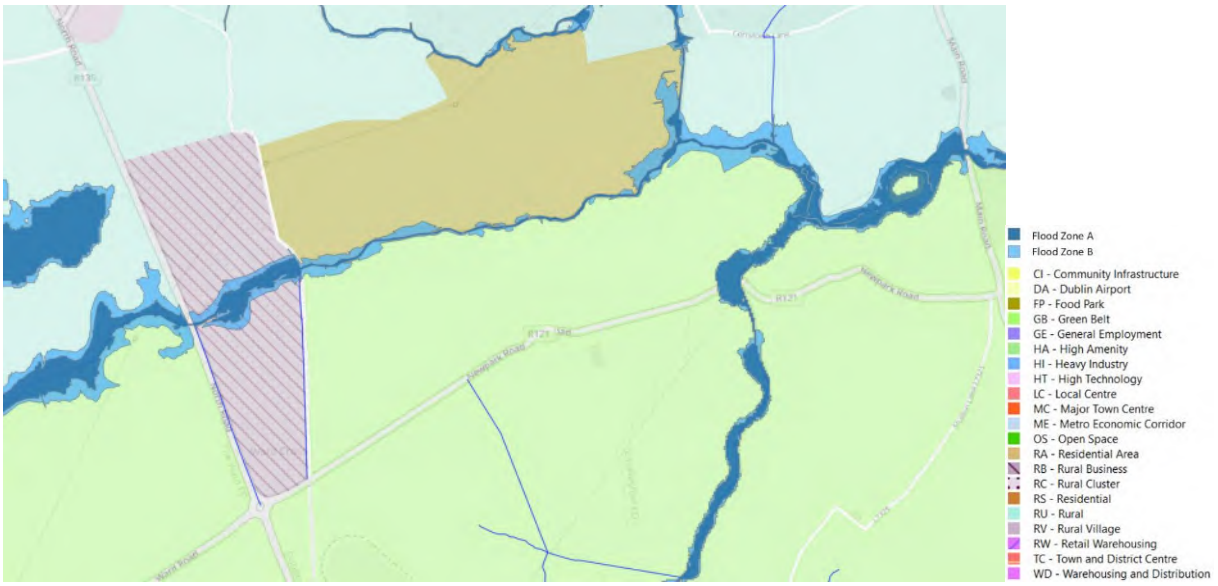
Flood Zone Data Source(s)	PFRA
Criteria 1	Ballymadun is a small Rural Cluster. The zoned lands will provide employment opportunities for the nearby rural population.
Criteria 2	While the site is undeveloped, the zoning is considered necessary to provide employment.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (PFRA) is not considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.11 Blakescross (Lusk)



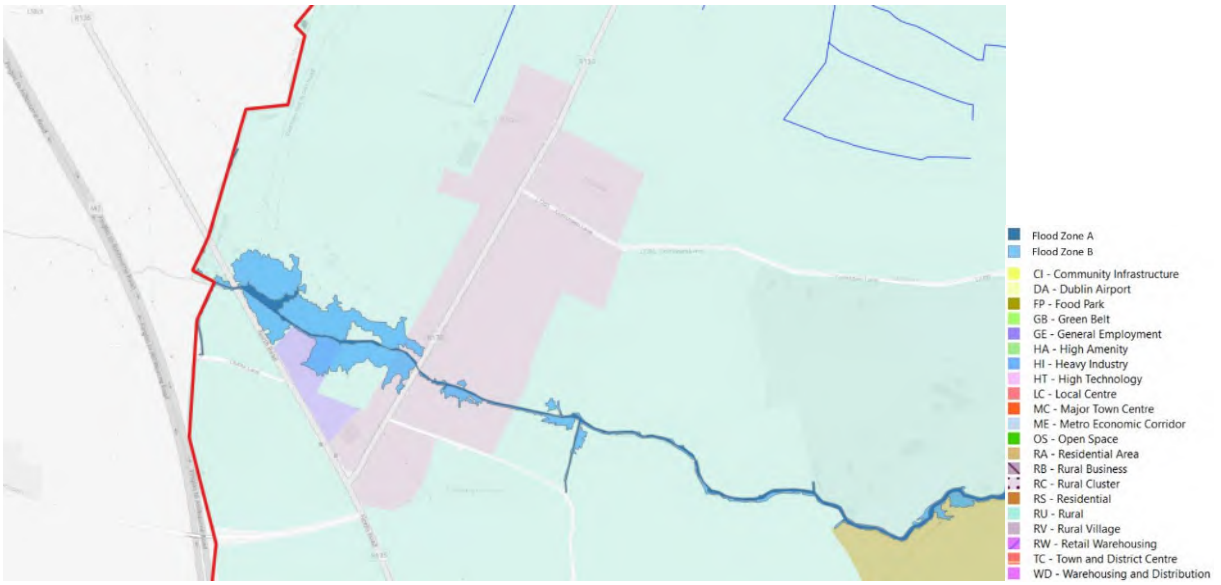
Flood Zone Data Source(s)	FEM FRAMS
Criteria 1	Blakescross is a small commercial area located south of Lusk, along the R132, providing local employment where the retention of existing enterprises and the promotion of new local employment opportunities will be encouraged, in accordance with the Regional Planning Guidelines.
Criteria 2	This area is a long-established area, and the zoning is necessary to provide for new employment opportunities for the local rural population.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (FEM FRAMS) is considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.12 Coolatrath



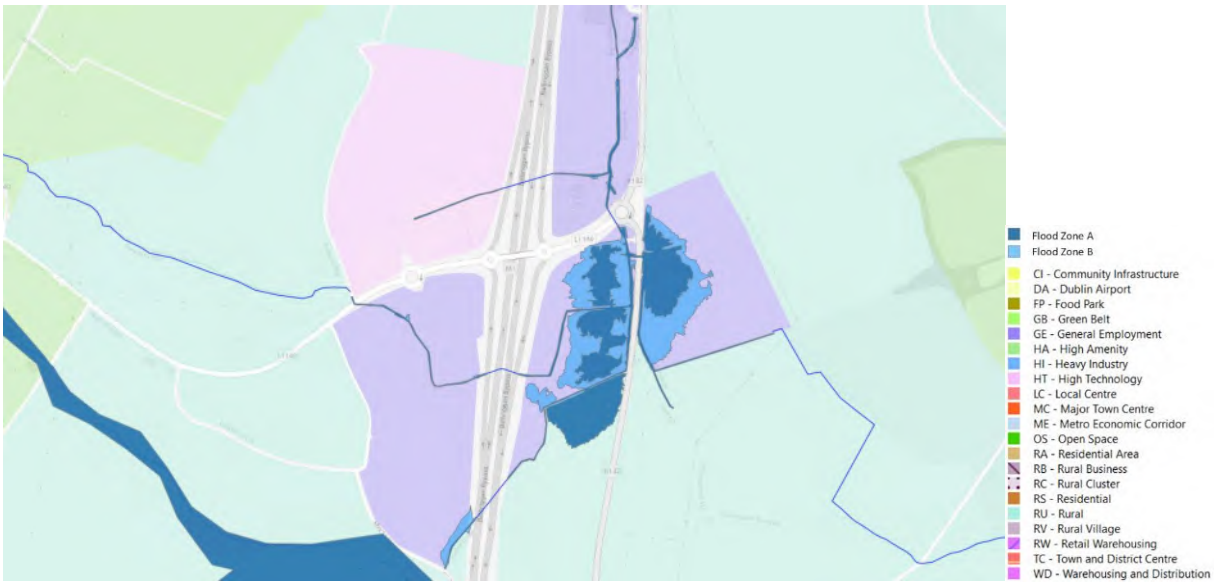
Flood Zone Data Source(s)	FEM FRAMS
Criteria 1	Coolatrath is a small commercial area located off the R130. The zoning provides for a Food Park and a Rural Business area and will provide local employment opportunities.
Criteria 2	While the site is undeveloped, the zoning is considered necessary to provide employment.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (FEM FRAMS) is considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.13 Coolquay



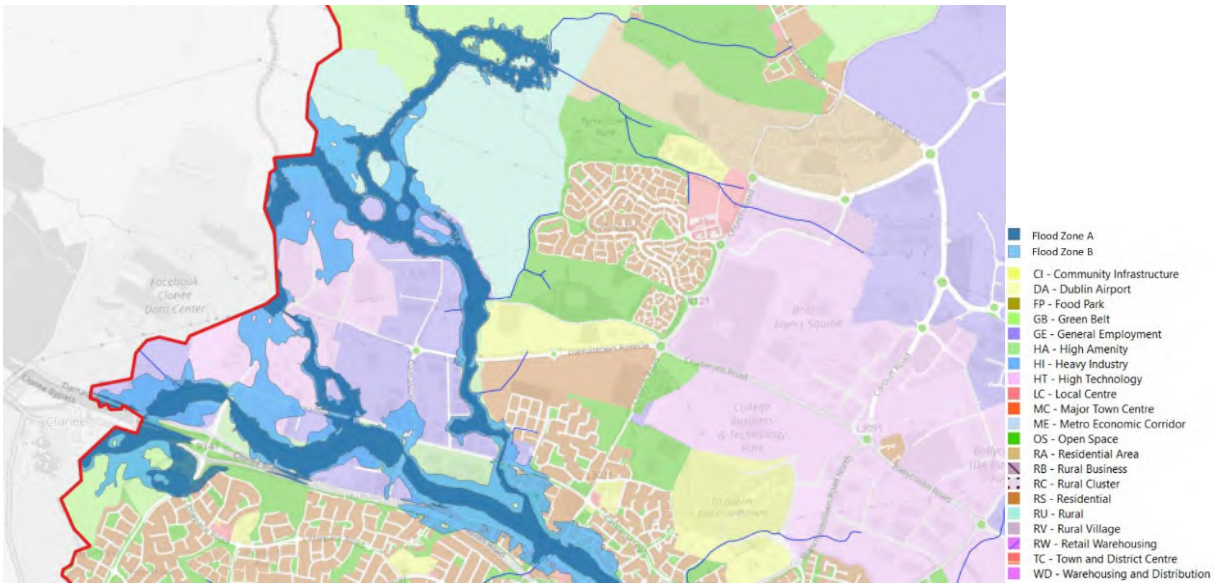
Flood Zone Data Source(s)	FEM FRAMS
Criteria 1	Coolquay is a linear settlement located in a rural area focused on the junction of the R135 and the R130. It is a commuter village in the Metropolitan Area.
Criteria 2	Given its status as a commuter village, within the Metropolitan Area, the level of growth must be carefully managed to ensure a vibrant sustainable community.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (FEM FRAMS) is considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.14 Courtlough



Flood Zone Data Source(s)	FEM FRAMS
Criteria 1	Courtlough is a small commercial area located to the South of Balbriggan. It is a long-established area. Courtlough provides opportunities for local employment where the retention of existing enterprises and the promotion of new local employment opportunities will be encouraged, in accordance with the Regional Planning Guidelines.
Criteria 2	The area is already established with a number of existing premises. A portion within one of the outer zoned sites is affected by flood risk. The site is currently undeveloped. The zoning is considered necessary to facilitate the overall zoning which has very good access to the M1. No other lands are available.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (FEM FRAMS) is considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.15 Damastown / Macetown / Clonee

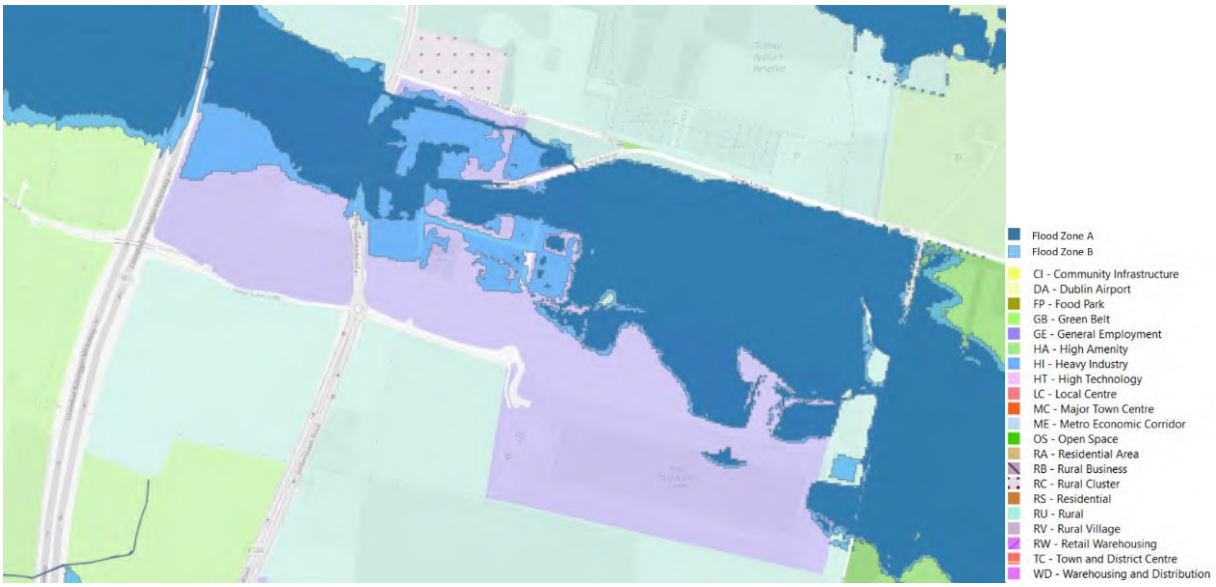


Flood Zone Data Source(s)	NIFM, Tolka Flood Study (*subject to model review*)
Criteria 1	Damastown, Macetown and Clonee is an industrial area to the west of Fingal in the Blanchardstown area. The area provides a local employment area where the retention of existing enterprises and the promotion of new local employment opportunities will be encouraged, in accordance with the Regional Planning Guidelines and has been zoned accordingly.
Criteria 2	This area is well established, and the zoning is necessary to provide for some employment for the local rural population. The area is on the outskirts of Blanchardstown, near the county boundary with Meath. No other lands are available.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (NIFM, Tolka Flood Study) is not considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.16 Howth / Baldoyle / Sutton

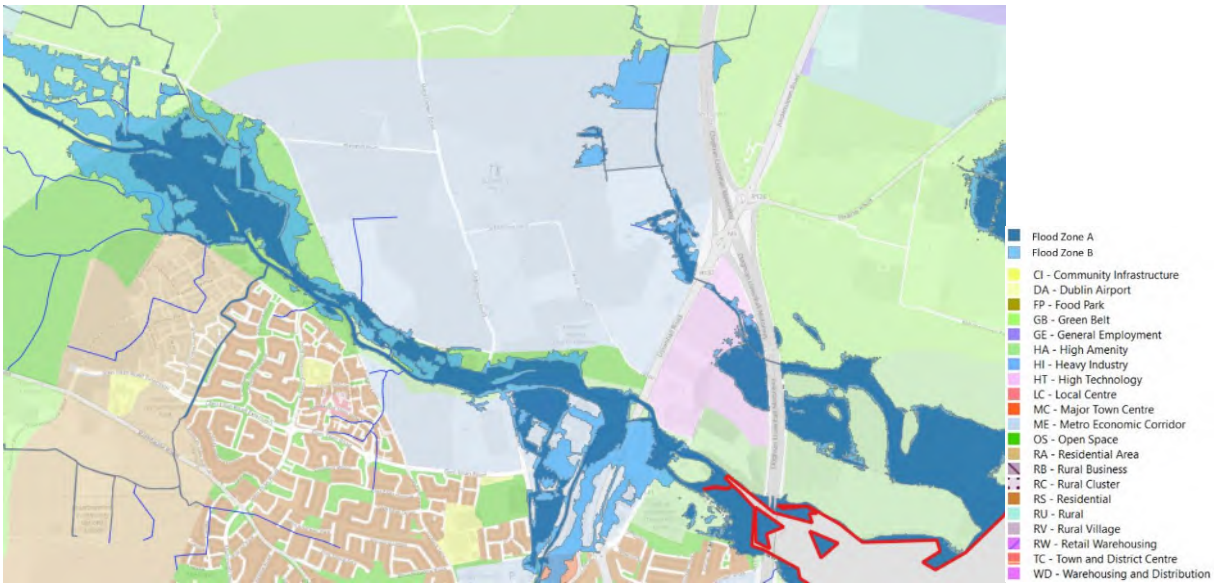
Flood Zone Data Source(s)	CFRAM, NCFHM
Criteria 1	Howth / Baldoyle / Sutton are towns located along the coast of Fingal. They are long established communities. The zoning allows for infill development and minor growth within the town.
Criteria 2	The zoning is considered appropriate. There are no other lands available.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (CFRAM, NCFHM) is considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.17 Lanestown / Turvey



Flood Zone Data Source(s)	FEM FRAMS, NCFHM
Criteria 1	Lanestown / Turvey is a small commercial area located to the west of Donabate, along the R132. It is a long-established area. Lanestown / Turvey provides a local employment area where the retention of existing enterprises and the promotion of new local employment opportunities will be encouraged, in accordance with the Regional Planning Guidelines.
Criteria 2	The area is already established with a number of existing premises. The zoning is considered necessary to facilitate the overall comprehensive development of the lands. The lands have very good access to the R132. No other lands are available.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (FEM FRAMS, NCFHM) is considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.18 Lissenhall

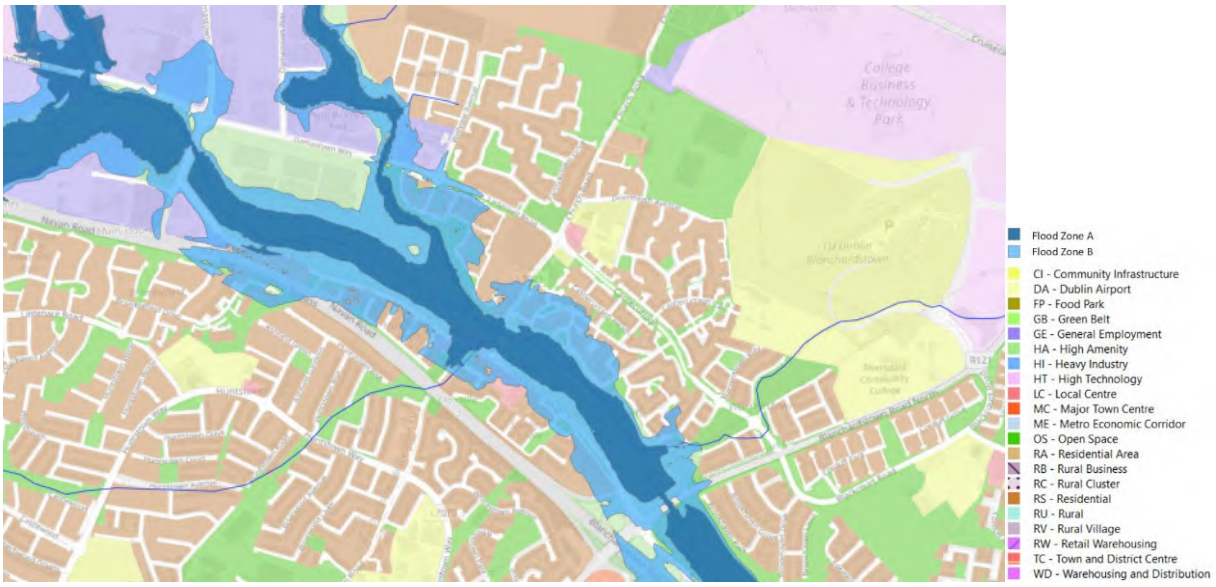


Flood Zone Data Source(s)	FEM FRAMS, NCFHM
Criteria 1	The lands at Lissenhall, lie immediately to the north of Swords, which is a designated growth area.
Criteria 2	The site is undeveloped but the zoning is considered necessary to provide for the growth of Swords. The area is on the outskirts of the town of Swords and is considered appropriate zoning.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (FEM FRAMS, NCFHM) is considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.19 Malahide

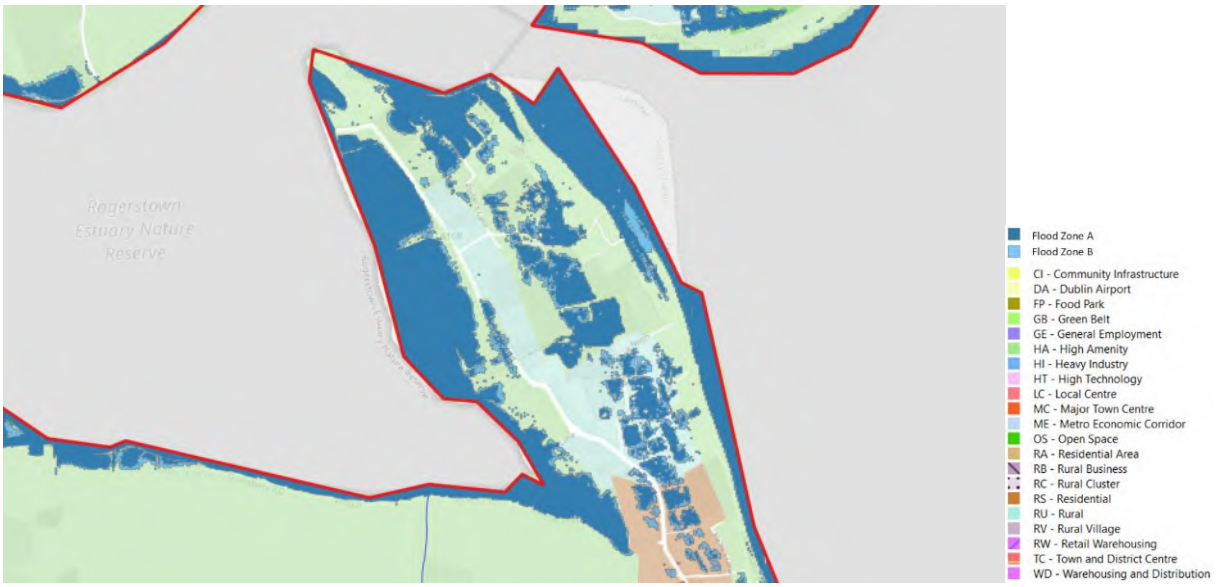
Flood Zone Data Source(s)	FEM FRAMS, NCFHM
Criteria 1	Malahide is town, situated along the coast, designated in the Regional Planning Guidelines as a Consolidation Area within a Gateway. The lands lie to the north of the village core and includes part of the Marina. The area contains long established dwellings and considered an integral part of the town centre.
Criteria 2	This area is a long established area and the zoning is necessary to provide for some infill development within the existing town boundary.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (FEM FRAMS, NCFHM) is considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.20 Mulhuddart



Flood Zone Data Source(s)	NIFM, Tolka Flood Study (*subject to model review*)
Criteria 1	Mulhuddart is a residential area to the north of Blanchardstown. It is a long established area and fairly well developed.
Criteria 2	The existing zoning remains compatible with the long established use and existing residential developments.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (NIFM, Tolka Flood Study) is not considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.21 Portrane

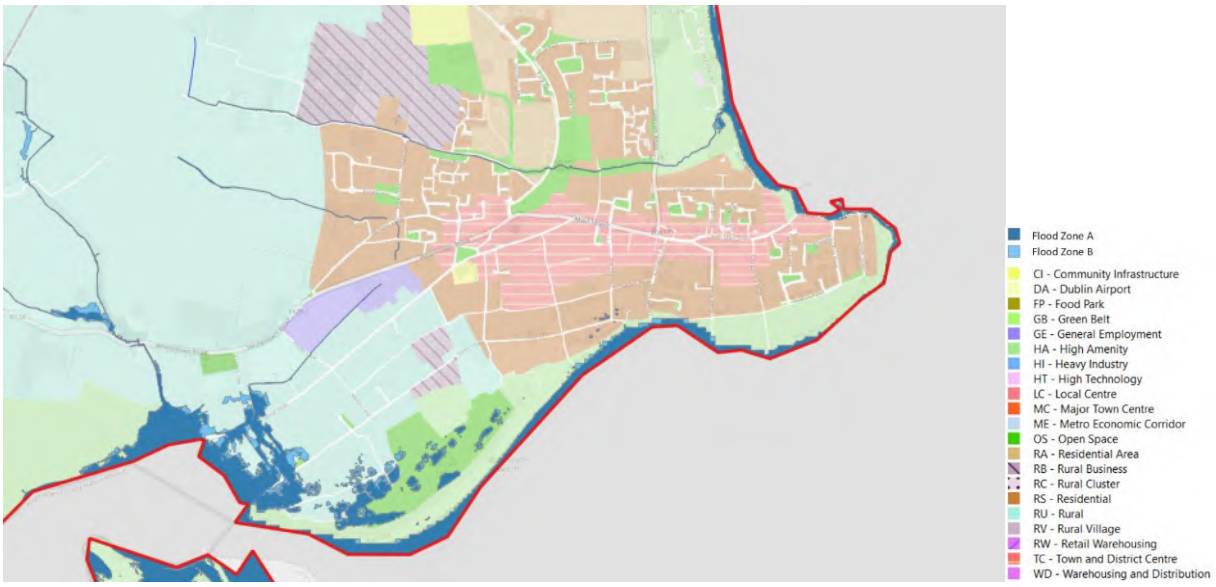


Flood Zone Data Source(s)	FEM FRAMS, NCFHM
Criteria 1	Portrane is a small village which lies along the coast, north of Donabate. It is an old established area.
Criteria 2	The zoned lands allow for the development of Portrane. No other lands are available. This area will be the subject of an Urban Framework Plan.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (FEM FRAMS, NCFHM) is considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.22 Rolestown

Flood Zone Data Source(s)	FEM FRAMS
Criteria 1	Rolestown is a small rural village. The zoning is integral to the development of the village and is in accordance with Regional Planning guidelines and the core and settlement strategy of the Plan.
Criteria 2	Only a small portion of the zoned lands is at risk of flooding. This area is at the centre of Rolestown and includes the site of an historic Mill. The proposed zoning is considered necessary. No other lands are suitable.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (FEM FRAMS) is considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.23 Rush

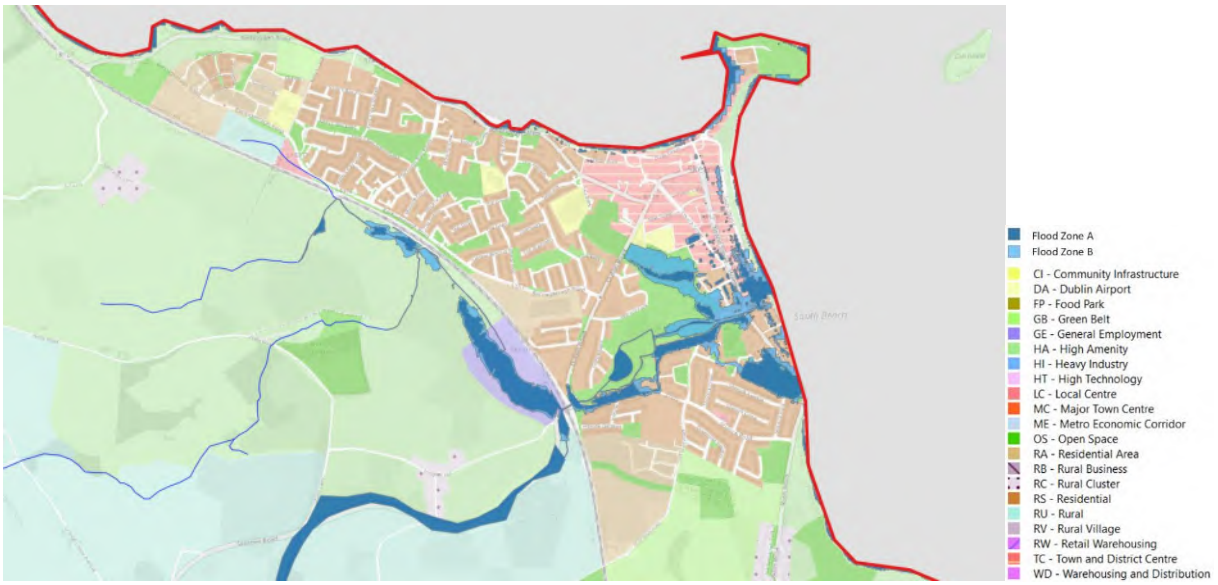


Flood Zone Data Source(s)	FEM FRAMS, NCFHM
Criteria 1	Rush is designated as a Moderate Sustainable Growth Town in the Regional Planning Guidelines and the Development Plan Core and Settlement Strategies These lands to the west of Rush, contain long established dwellings and the area is considered an integral part of the town.
Criteria 2	This area is a long established area, and the zoning is necessary to provide for some infill development within the existing town boundary.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (FEM FRAMS, NCFHM) is considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.24 Santry Close

Flood Zone Data Source(s)	CFRAM
Criteria 1	Santry is a residential area to the south of the airport. It is a long established area and fairly well developed.
Criteria 2	The existing zoning remains compatible with the long established use and existing residential developments.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (CFRAM) is considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.25 Skerries

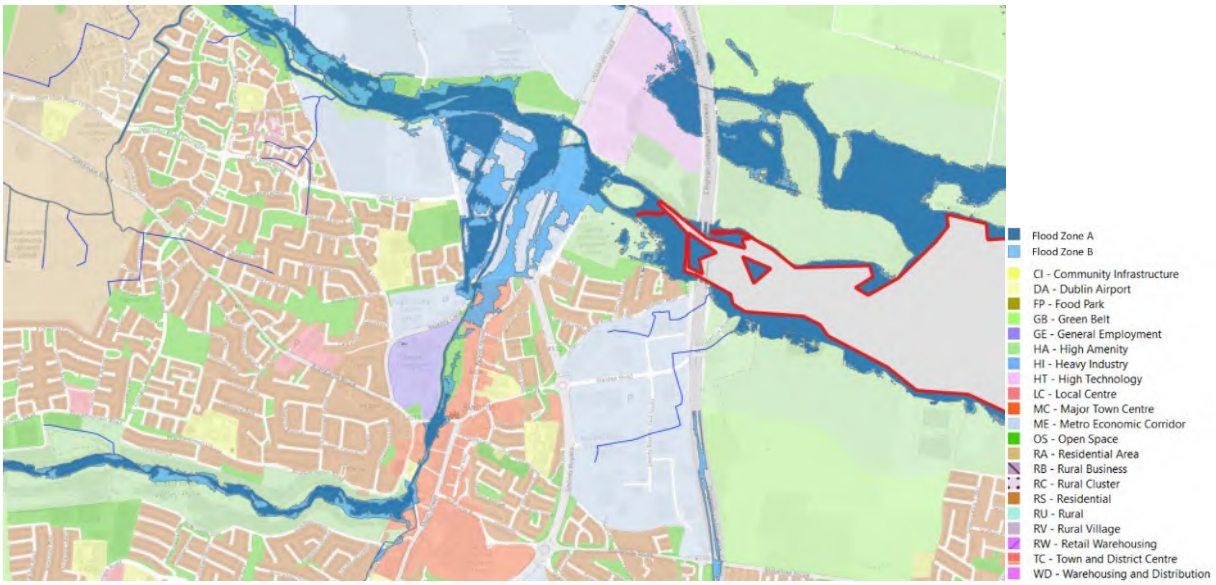


Flood Zone Data Source(s)	FEM FRAMS, NCFHM
Criteria 1	Skerries is designated as a large town in the Regional Planning Guidelines. The zoned lands represent employment opportunities located to the west of Skerries. This will provide a significant local employment area where the promotion of new local employment opportunities will be encouraged, in accordance with the Regional Planning Guidelines.
Criteria 2	While the site is undeveloped, the zoning is considered necessary to provide opportunity for employment. The area is on the outskirts of the town of Skerries and is considered appropriate zoning.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (FEM FRAMS, NCFHM) is considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.26 Streamstown (Malahide)

Flood Zone Data Source(s)	FEM FRAMS, CFRAM
Criteria 1	Streamstown is a developing area to the south of Malahide. On the outskirts of Malahide, the zoned lands provide an area to allow for growth in accordance with the Regional Planning Guidelines.
Criteria 2	The area is existing and adjoins the more established area of Malahide, with access onto the Dublin Road. No other lands are available.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (FEM FRAMS, CFRAM) is considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

5.2.27 Swords



Flood Zone Data Source(s)	FEM FRAMS, NCFHM
Criteria 1	Swords is the county town of Fingal and it is a long-established area and very well developed.
Criteria 2	The existing zoning remains compatible with the long-established use and existing residential developments.
Criteria 3	This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (FEM FRAMS, NCFHM) is considered suitable for this Stage 2 Initial Flood Risk Assessment. It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test. Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA.

6 DEVELOPMENT MANAGEMENT

6.1 Overview

This SFRA has been prepared to support the Strategic Environmental Assessment of the Fingal County Development Plan 2023-2029, in accordance with the OPW Guidelines. It has considered flood risk information and data from a variety of sources and presented Stage 1 and Stage 2 flood risk assessments.

The SFRA has also set out requirements for all new development in the plan area during the 6-year period of the Fingal County Development Plan 2023-2029. Development management of flood risk shall be in accordance with the OPW Guidelines, as well as policies in this document to take account of local factors.

The overarching purpose of development management measures is to ensure that:

- Development will not be at unacceptable risk of flooding
- Development will not increase flood risk elsewhere

6.2 Stages of Flood Risk Assessment

The OPW Guidelines set out in detail the requirements for all scales and stages of FRA, and the subsequent requirements to be applied to proposed development in Fingal is designed to be implemented alongside that of the OPW Guidelines and associated Technical Appendices.

The three stages of flood risk assessment are (as described in Section 3.9.1):

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

In order to ensure that flood risk is considered at an early stage to protect future development and increase flood resilience and sustainability, all development is required be subject to Stage 1 Flood Risk Identification / flood risk screening as a minimum. Where a source and pathway for flood risk is identified then further assessment in the form of a Stage 2 FRA (or dependent on the nature of the flood source and pathway, Stage 3 FRA) will be required.

All development subject to a Stage 2 FRA (or greater) will be required to submit a Site-Specific Flood Risk Assessment (SSFRA) in support of any associated planning application(s). It is noted that Stage 1 FRAs may be undertaken without the need for a full SSFRA report.

All SSFRAs must demonstrate that a sequential approach was applied to site layout and design. The scale / stage of SSFRA will depend on the risks identified and the proposed land use as outlined in the following sections.

6.2.1 Flood Risk Assessment

FRAs aim to identify, quantify, and communicate to stakeholders and decision-makers the risk of flooding to land, property, and people. The purpose of an FRA is to provide sufficient information to determine whether applications for proposed development are appropriate. An FRA should therefore:

- Identify whether (and the degree to which) flood risk is an issue
- Identify Flood Zones
- Inform decisions in relation to development of site layouts
- Develop appropriate flood risk mitigation and management measures for proposed developments

Assessment of flood risk is therefore a fundamental component of proposing and planning development. FRAs are typically undertaken over a number of stages with the need for progression to a more detailed stage dependent on the outcomes of the former stage until the level of detail of the FRA is appropriate to support the proposed development. The following sections summarise the requirements / content of each stage, as per the OPW Guidelines.

6.2.1.1 Stage 1 FRA

A Stage 1 FRA is to identify whether there may be any flooding or surface water management issues related to a proposed development that may warrant further investigation. Identification is the process for deciding whether a proposed development requires a Stage 2 / Stage 3 FRA report and is essentially a desk-based screening exercise based on existing information.

To establish whether a flood risk source affects a site (now or in the future) may exist in the future, the site location should be screened against number a range of data sources including, but not limited to:

- SFRA flood maps[1] including Climate Change flood maps
- OPW flood maps (floodinfo.ie)
- OPW benefitting land / arterial drainage maps (floodinfo.ie)
- OPW 'Past Flood Events' (floodinfo.ie)
- Flood data obtained from stakeholders (OPW, landowner etc.)
- Proximity (on plan and elevation) to unmodelled watercourses for which no flood data exists.

All sites must consider the impact of flooding from sources other than rivers and sea including surface water flood risk. It is an objective of the SFRA that all sites implemented surface water drainage (SuDS) measures to manage effects from drainage to flood risk elsewhere.

A Stage 1 FRA will conclude either:

- No potential source of flood risk or surface water management issue has been identified.
- If the site is affected by or proximal to a source of flooding, then a Stage 2 / Stage 3 FRA is required to further assess an identified source of potential flood risk.

A Stage 1 FRA does not necessarily require specialist skills. There may not be a requirement for submission of a SSFRA where the outcomes can be conveyed in another manner (e.g. inclusion on planning drawings).

6.2.1.2 Stage 2 FRA

A Stage 2 FRA is to confirm sources of flooding that may affect a proposed development site, to appraise the adequacy of existing information and to determine what surveys and modelling approach is appropriate for the spatial resolution required / complexity of the flood risk issues.

Appraisal and assessment of flood risk shall be proportionate to the scale and nature of the development proposed, the risk to the development and effect elsewhere, and the complexity of the flood source or pathway.

It is the responsibility of the developer / applicant to seek out an appropriately qualified flood risk professional / hydrologist to undertake such an assessment.

The extent of the risk of flooding should be assessed which may involve preparing indicative flood zone maps. Where existing river or coastal models exist, these should be used broadly to assess the extent of the risk of flooding and potential impact of a development on flooding elsewhere and of the scope of possible mitigation measures.

A Stage 2 FRA must be sufficiently detailed to allow the determination of the flood risk to proposed development. The initial assessment may determine that sufficient quantitative information is already available, appropriate to the scale and nature of the development proposed, for the necessary decision to be made. If not, then the onus is on the applicant to produce new flood data (by flood modelling) and the Flood Risk Assessment should progress to Stage 3.

A Stage 2 FRA will generally fully incorporate the findings and outcomes of the Stage 1 FRA and expand on the to include the following:

- An examination of all sources of flooding that may affect a site.
- An appraisal of the availability and adequacy of existing information.

[1] *Note that flood data shown on SFRA mapping may be superseded or updated within the lifetime of the Plan*

- Produce flood zone map where not available.
- Determine what technical studies are appropriate.
- Describe what residual risks will be assessed.
- Potential impact of development on flooding elsewhere.
- Scope of possible mitigation measures and what compensation works may be required and what land may be needed.
- Set out requirements for subsequent stages of FRA.

There are two possible outcomes of a Stage 2 FRA:

- Potential sources of flood risk or surface water management issues identified in a Stage 1 FRA have been shown to not pose a risk of flooding to the proposed development,
- Stage 3 FRA is required to further assess an identified flood risk (typically requiring hydraulic modelling).

A Stage 2 SSFRA to support a planning application should take the form of a comprehensive FRA report and be submitted to the Local Authority.

6.2.1.3 Stage 3 FRA

A Stage 3 FRA is 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 impact on flood risk elsewhere and of the effectiveness of any proposed mitigation measures. As per the OPW Guidelines, 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 processes involved.

Where Stage 1 / Stage 2 FRAs indicate that a proposed development is at risk of flooding, a detailed Stage 3, incorporating findings and outcomes from previous Stages, must be carried out.

Assessment of flood risk and any subsequent mitigation measures principally relies on estimation of flow, level and the performance of the development at an appropriate degree of accuracy that will deliver 'fit-for-purpose' information for decision-making. It is also important that an assessment of flood risk should consider both the actual and the residual risks:

- Actual flood risk is the risk posed to an area, whether it is behind defences or undefended, at the time of the study. This should be expressed in terms of the probability of flooding occurring, taking into account the limiting factors, both natural and manmade, preventing water from reaching the development.
- Residual risks are the risks remaining after all risk avoidance, substitution and mitigation measures have been taken. Examples of residual risks include the failure of flood management measures, blockages and a flood event that exceeds the flood design standard.

Recommended content for a Stage 3 FRA, in addition to that included in Stage 1 and Stage 2 analysis, includes but it is not limited to:

- Initial assessment / Stage 2 summary
- Hydrological calculations
- Hydraulic model assessment / summary
- Assessment of climate change and culvert blockage
- Proposed mitigation measures; freeboard; evaluation of the effect of development on flood risk elsewhere; requirements for Flood Compensatory Storage (FCS) as per Section 6.5.5 etc.
- Supporting information; drawings, maps, calculations etc.

6.2.2 Site Specific Flood Risk Assessment Report

The outcomes of a Stage 2 or Stage 3 flood risk assessment should be reported in an appropriate site-specific flood risk assessment (SSFRA) report.

SSFRAs should be carried out in accordance with the OPW Guidelines and requirements established by this SFRA and should present in sufficient detail:

- The potential flood risk to a proposed development based on the Source-Pathway-Receptor model.

- Assessing existing flood risk in terms of the likelihood of flooding and resultant consequences.
- Assessing the potential, post-development risks having regard to the design of mitigation and compensation measures.
- Any additional risk of flooding to the proposed development due to climate change and culvert blockage.
- Any proposed mitigation measures including setting of FFLs and FGLs
- Details of the surface water / SuDS drainage proposals

Further details relating to the content of all Stages of FRA can be found in the OPW Guidelines and associated Technical Appendices.

6.3 Flood Zoning

Flood Zoning for development management shall apply as outlined in Section 3.6 of this report. Flood Zones established by this SFRA, and any new assessments of Flood Zones established by site-specific assessments are to be generated without the inclusion of climate change factors. The presence of flood protection structures should be ignored as areas protected by flood defences still carry a residual risk from overtopping or breach of defences.

Flood Zones represent flood extents for the existing, undefended present-day scenario. Once Flood Zones have been established, proposed development layouts should be prepared in line with the requirements of the OPW Guidelines, as outlined in the following sections. Flood Zones are established based on suitable available information or site-specific hydraulic modelling where identified as necessary by a Stage 2 FRA.

Hydraulic modelling should be proportionate and fit for purpose and shall be undertaken by an appropriately qualified competent and experienced professional. Where a model is intended to challenge or better define SFRA flood zone mapping then any new modelling must be of an equivalent or better standard.

Flood Zones determined on mapping with this SFRA are not exhaustive and 'new' Flood Zones may be developed by SSFRAs and / or new flood risk datasets produced and published during the lifetime of the County Development Plan.

6.4 The Sequential Approach and Justification Test

6.4.1 Sequential Approach

In the preparation of proposed layouts, prior to any planning application, the Sequential Approach outlined in Section 3.10.1 should be followed to ensure that flood risk to development is minimised and greatest protection from flooding is given to higher vulnerability developments.

The sequential approach aims to:

- Avoid flood risk where possible, substitute less vulnerable uses where avoidance is not possible, and mitigate and manage the risk where avoidance and substitution are not possible.
- Apply the Justification Test for development in flood risk areas.

The receptor vulnerability (see Table 3.3) will apply in determining the suitability of any proposed development. Siting of development in an inappropriate Flood Zone, as shown in Table 6.1, will require the application of a Development Management Justification Test (refer to Table 6.2).

Residual risks that have the potential to increase flood extents and levels higher than Flood Zones, such as climate change (see Section 6.5.1) and culvert blockage (see Section 6.5.2) must be considered and presented as part of any SSFRA.

Table 6.1: Vulnerability and Flood Zone Matrix for Justification Test

Development Vulnerability	Flood Zone A	Flood Zone B	Flood Zone C
Highly Vulnerable (including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less Vulnerable	Justification Test	Appropriate	Appropriate
Water-compatible	Appropriate	Appropriate	Appropriate

6.4.2 Development Management Justification Test

Where development is proposed in an 'inappropriate' Flood Zone, a Justification Test must be applied and submitted alongside a Stage 3 SSFRA. The criteria of a development management Justification Test that must be satisfied are set out in Table 6.2, as per the OPW Guidelines.

Where the primary mitigation for a site in Flood Zone A or Flood Zone B is a flood defence that protects the area from being located in functional floodplain, the Justification Test and SSFRA should contain information relating to the standard of protection, nature, and maintenance / monitoring arrangements of the defence.

Table 6.2: Development Management Justification Test

No.	Criteria
1	The subject lands have been zoned or otherwise designated for the particular use or form of development in the Fingal Development Plan 2023-2029, which has been adopted or varied taking account of the OPW Guidelines.
2	The proposal has been subject to an appropriate flood risk assessment that demonstrates: • The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk • The development proposal includes measures to minimise flood risk to people, property, the economy, and the environment as far as reasonably possible • The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access • The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.

The acceptability or otherwise of levels of residual risk should be made with consideration of the type and foreseen use of the development and the local development context.

Applications for minor development, such as small extensions to houses, and most changes of use of existing buildings and or extensions and additions to existing commercial and industrial enterprises, are unlikely to raise significant flooding issues, unless they obstruct important flow paths, introduce a significant additional number of people into flood risk areas or entail the storage of hazardous substances. Since such applications concern existing buildings, the sequential approach cannot be used to locate them in lower-risk areas and the Justification Test will not apply. However, a commensurate assessment of the risks of flooding should accompany such applications to demonstrate that they would not have adverse impacts or impede access to a watercourse, floodplain or flood protection and management facilities. These proposals should follow best practice in the management of health and safety for users and residents of the proposal.

6.5 Flood Risk Mitigation

The primary objective of the OPW Guidelines and Development Management requirements outlined in this SFRA is to ensure development is resilient relative to the design flood event; 1% AEP for less vulnerable development and 0.1% AEP for highly vulnerable development.

In addition, there are further flood events and residual risk that must be considered as outlined on the following sections.

6.5.1 Climate Change

The OPW Guidelines and Fingal County Development Plan 2023-2029 recognise that climate change, including its potential impact on flood risk, is a key consideration for future development. Allowances for the Mid-Range Future Scenario (MRFS) and High-End Future Scenario (HEFS) are shown in Table 6.3, based on the OPW's Climate Change Sectoral Adaptation Plan, 2019.

The potential impact of climate change on development proposals should be considered for any site where a Stage 2 or Stage 3 FRA has been identified as being required (i.e. flood risk has not been screened out in a Stage 1 FRA). The source of climate change flood risk may be coastal, fluvial or pluvial and will generally results in higher flood levels and wider flood extents tan present-day projections.

Climate change projections are to be applied depending on the receptor vulnerability as follows:

- HEFS is to be considered for 'highly vulnerable' development
- MRFS is to be considered for 'less vulnerable' development
- Climate change is generally not a critical consideration for 'water compatible' development but if required (e.g. to ascertain flood depths), the MRFS will apply

For mixed use developments, both HEFS and MRFS should be assessed and applied depending on the vulnerability of the part of the development under consideration.

For purposes of site-specific flood risk assessment to inform development management and control:

- Coastal climate change levels can be determined by applying predicted level rises (Table 6.3) to the coastal flood risk dataset available for the Fingal coastline (derived from NCFHM datasets) shown on SFRA MRFS and HEFS flood maps and available at floodinfo.ie.
- Climate change impacts on fluvial flooding where no mapped flood data is available are to be assessed by an appropriate methodology which will normally[2] require site-specific hydraulic modelling by increasing the estimated flows by the factor shown in Table 6.3.

Table 6.3: OPW Climate Change Allowances

Parameter	Mid-Range Future Scenario (MRFS)	High End Future Scenario (HEFS)
Mean Sea Level Rise	+ 500 mm	+ 1000 mm
Peak River Flood Flows	+ 20%	+ 30%
Extreme Rainfall Depths	+ 20%	+ 30%

6.5.2 Culvert Blockage

Residual risk associated with the blockage of any watercourse crossing (i.e., culvert, bridge, etc.) that has the potential to increase flooding at the proposed development site should be assessed as part of a Stage 3 SSFRA.

[2] The OPW Guidelines state that in the absence of climate change data, the 0.1% AEP flood can be taken / applied as the 1% AEP + CC flood but this approach should only be used the effect is proportionate the scale and nature of the development

At a minimum, a 50% blockage scenario should be considered. Where there is an established history of blockage or site conditions suggest a greater blockage is likely, then greater %-blockage should be assessed.

Where multiple watercourse crossings have the potential to increase flooding at the proposed development site, a joint probability analysis of simultaneous cumulative blockages should be assessed.

While flood extents predicted for a blockage scenario do not influence flood zoning, this residual risk to the proposed development should be assessed, and adequate mitigation and management measures should be proposed to manage flood risk to the proposed development.

A site-specific hydraulic model is likely to be required to facilitate assessment of the impact of watercourse crossing blockage.

6.5.3 Design Levels and Freeboard

A key mechanism for providing flood protection and resilience is the setting of Finished Floor Levels (FFLs), Finished Ground Levels (FGLs), or flood defence levels with appropriate freeboard above the relevant design flood levels.

Freeboard is a safety margin to account for uncertainties in water-level prediction and / or structural performance. It is the difference between the FFL / FGL or flood defence and the adjacent design flood level. Freeboard is designed to account for uncertainty in hydrological predictions, wave action, modelling accuracy, topographical accuracy and the quality of digital elevation models.

Due to the varying sensitivity of development, freeboard is to be applied based on the classification of receptor vulnerability. Where minimum freeboard requirements cannot be met, a lesser standard of protection must be justified within a SSFRA. If achieving freeboard requires raising of ground levels within a floodplain, then the requirement for Floodplain Compensatory Storage as outlined in Section 6.5.5 must be considered.

In addition to the requirements outlined below, including in areas not predicted to be at risk of flooding, then the siting of building floor levels should seek to ensure resilience to surface water flooding or drainage system failure.

6.5.3.1 Coastal / Tidal Flooding

Minimum freeboard requirements when the maximum design flood level is coastal / tidal are as set out in Table 6.4.

In some instances, such as minor development / infill in existing developed / zoned areas or for sites benefitting from flood defences, freeboard requirements can potentially be relaxed if justified as part of a SSFRA and adequate mitigation (including emergency planning) is included in overall site design. Consultation with the Local Authority prior to submission of a planning application in relation to reduction in min. freeboard requirements is recommended.

Table 6.4: Minimum Design Level Requirements for Coastal / Tidal Flooding

Receptor Vulnerability	Minimum Design Level Requirements
Highly Vulnerable	0.1% AEP HEFS CC flood level + **250mm** freeboard
Less Vulnerable	0.5% AEP MRFS CC flood level + **250mm** freeboard
Water Compatible	No minimum design level requirement

6.5.3.2 *Fluvial Flooding*

Minimum freeboard requirements when the maximum design flood level is fluvial are as set out in Table 6.5.

In some instances, such as minor development / infill in existing developed / zoned areas or for sites benefitting from flood defences, freeboard requirements can potentially be relaxed if justified as part of a SSFRA and adequate mitigation (including emergency planning) is included in overall site design. Consultation with the Local Authority prior to submission of a planning application in relation to reduction in min. freeboard requirements is recommended.

Table 6.5: Minimum Design Level Requirements for Fluvial Flooding

Receptor Vulnerability	Minimum Design Level Requirements
Highly Vulnerable	Greater of: • 0.1% AEP (present day / Flood Zone B) flood level + **500mm** freeboard • 0.1% AEP HEFS CC flood level + **250mm** freeboard
Less Vulnerable	Greater of: • 1% AEP (present day / Flood Zone A) flood level + **500mm** freeboard • 1% AEP MRFS CC flood level + **250mm** freeboard
Water Compatible	No minimum design level requirement

6.5.4 Access and Egress

In accordance with the OPW Guidelines, access to and egress from any development should be within Flood Zone C (i.e., outside the 0.1% AEP fluvial / coastal floodplain). Where this is not achievable due to on-site or off-site flood risk, a Flood Management Plan for the development will be required. The contents of the Flood Management Plan should be confirmed within a SSFRA.

SSFRAs should outline the emergency procedures that will be applied in the event of a flood. Evacuation routes should be identified but if this is not possible then containment may be considered if is considered safe and practical to do so. If either safe evacuation or containment is not possible, then the development proposal may be refused.

6.5.5 Flood Compensatory Storage / Floodplain Re-Profiling

The likely impact of any displaced flood water on lands elsewhere caused by alterations to ground levels, reducing floodplain attenuation, impeding flood flow routes, or raising flood embankments requires Flood Compensatory Storage (FCS) works to be undertaken. However, it is generally accepted that land raising in direct coastal floodplains (i.e. excluding tidally influenced watercourses and estuaries) has negligible effect on flooding elsewhere and as such those proposals will not require FCS.

FCS strategies are divided into direct and indirect. These terms come from UK Construction Industry Research and Information Association (CIRIA) report C624 "Development and flood risk – guidance for the construction industry (2004)".

- Direct or 'level for level' methods, as they are also known, re-grade land and provide a direct replacement for the lost storage volume.
- Indirect methods rely on water entering a defined storage area which then releases it at a slower rate, similar to a surface water attenuation scheme.

The OPW Guidelines state that level for level FCS should apply to any loss in the 1% AEP / Flood Zone A functional floodplain volume. The approach to level for level FCS is summarised as follows:

- A volume of floodplain equal to that lost to the proposed development should be created.

- The equal volume should apply at all levels between the lowest point on the site and the design flood level. Normally this is calculated by comparing volumes taken by the development and the volume offered by the compensatory storage for a number of horizontal slices through the range defined above.
- The thickness of a slice should be typically 0.1 m. In the case of large flat sites or very steep sites this may be varied to 0.2 m or even 0.05 m in order to have about 10 slices to compare.
- Level for level FCS storage should be provided equal to or exceeding that lost as a result of development for each of these slices.

Consultation prior to submitting a planning application is required with the Local Authority on a site-specific basis for proposed developments that proposed to change ground levels / cause land raising in Flood Zone B. FCS / floodplain re-profiling for the 0.1% AEP / Flood Zone B flood event may be required. While less vulnerable development is 'appropriate' within Flood Zone B, FCS may be required to ensure no increase in flood risk elsewhere up to the 0.1% AEP flood. FCS for the 0.1% AEP flood event is to be provided on a level-for-level basis as much as possible but can be undertaken on a 'volumetric' approach if necessary. The approach to volumetric FCS is summarised as follows:

- A volume of floodplain equal to that lost to the proposed development should be created.
- The equal volume should apply between the lowest point on the site and the design flood level, calculated at a number of horizontal slices as far as possible.
- Volumetric FCS storage should be provided equal to or exceeding the total lost as a result of development.
- Provided FCS volume should not be provided at a lower level than existing lowest ground level in an area that will not naturally drain into the watercourse as floodwater subsides.

It is noted that a site-specific hydraulic model is likely to be required to facilitate assessment of the impact of FCS at the site and surrounding areas.

In addition to the requirements listed above, when completing a site-based FRA as part of meeting the requirements of the Justification Test, an assessment will be required of on- and off-site opportunities for reducing flood risk overall (e.g. flood storage). This will include an appraisal of wider flood risk management measures to which the development can contribute.

6.6 Drainage and Surface Water Management

All development proposals shall carry out a surface water and drainage assessment and shall be compliant with the following to ensure that drainage from the site is managed sustainably:

- Fingal CC Green / Blue Infrastructure for Development Guidance Note (2021)
- CIRIA SuDS Manual C753 (2015)
- Greater Dublin Regional Code of Practice for Drainage Works (2012)
- Greater Dublin Strategic Drainage Study (GDSDS) (2005)

7 SUMMARY

7.1 Overview

In achieving the objectives of the OPW Guidelines, Fingal CC must:

- Adopt a sequential approach to flood risk management, which aims to (1) avoid flood risk where possible, (2) substitute less vulnerable uses where avoidance is not possible, and (3) mitigate and manage the risk where avoidance and substitution are not possible.
- Apply the Justification Test for development in flood risk areas.

A precautionary approach should also be applied to flood risk management to reflect uncertainties in available flood data, risk assessment techniques, climate change projections, performance of existing flood defences, and extent of future coastal erosion.

This SFRA report has been prepared in accordance with the OPW Guidelines and provides an assessment of all sources of flood risk within the Fingal area to assist Fingal CC in making informed strategic land-use decisions. The collation and presentation of flood risk information will support Fingal CC to apply the requirements of the OPW Guidelines including the sequential approach and Justification Test. The SFRA also outlines the requirements of site-specific FRAs through development management.

7.2 SFRA Review and Monitoring

The SFRA will be reviewed and updated every six years in line the County Development Plan review process. Additionally, outputs from future studies and datasets may trigger a review and update of the SFRA during the lifetime of the 2023-2029 Development Plan. With regard to Climate Change, the OPW is currently transitioning to regional based climate models that reflect the likely varied impacts throughout the island of Ireland. This is likely to be implemented during the lifetime of the proposed county development plan.

Proposed developments should take account of the most up to date OPW guidance on climate change as part of site-specific Flood Risk Assessments.

Appendix A

Flood Zone Maps

LEGEND

Fingal County Administrative Boundary

Overview Map Page Number Reference

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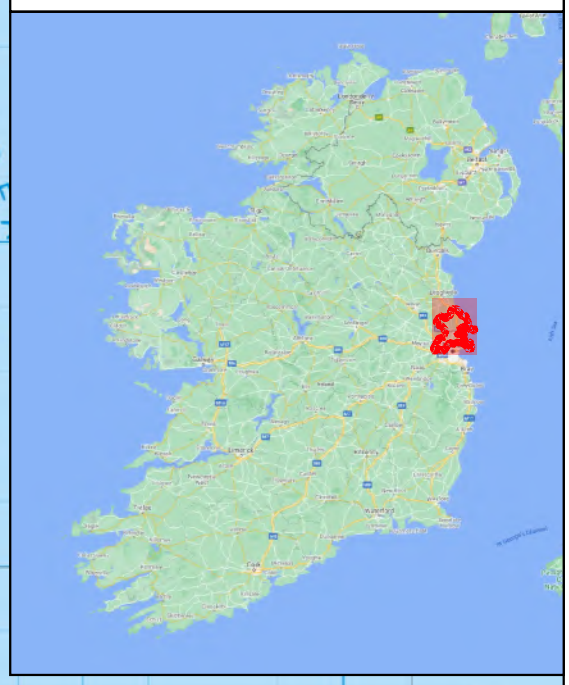

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BALBRIGGAN Baile Brigín

SKERRIES Na Sceirí

Lambay Island

IRISH SEA Muir Éireann

DUBLIN

701000 711000 721000 731000

765000 755000 745000 735000

0 2.5 5 km

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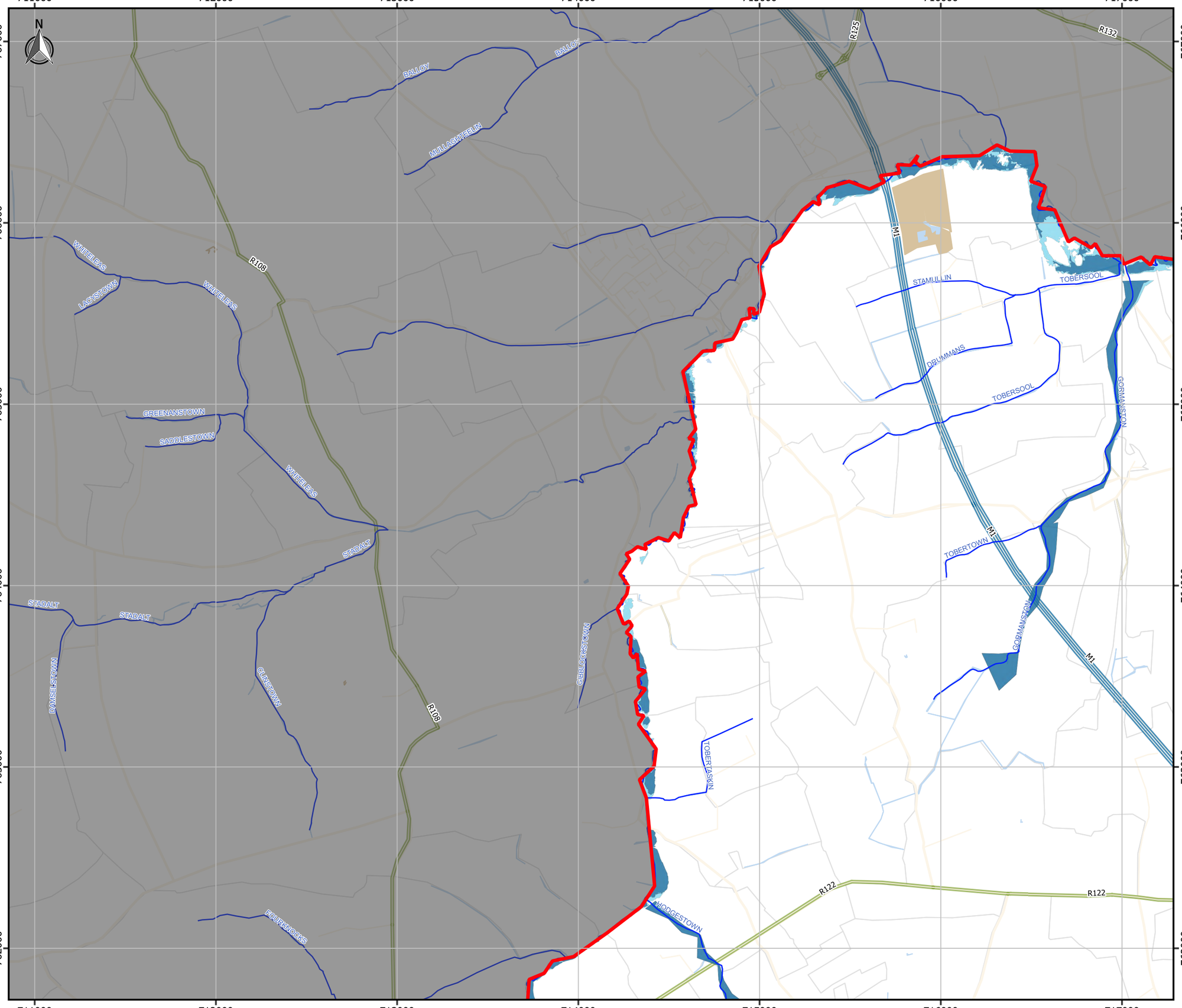

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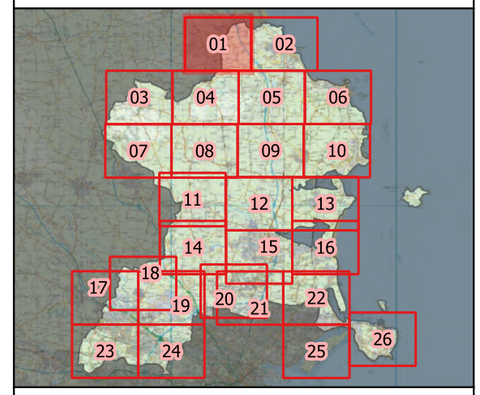

LEGEND

- Fingal County Administrative Boundary
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- Flood Zone B
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- Area for Further Consideration

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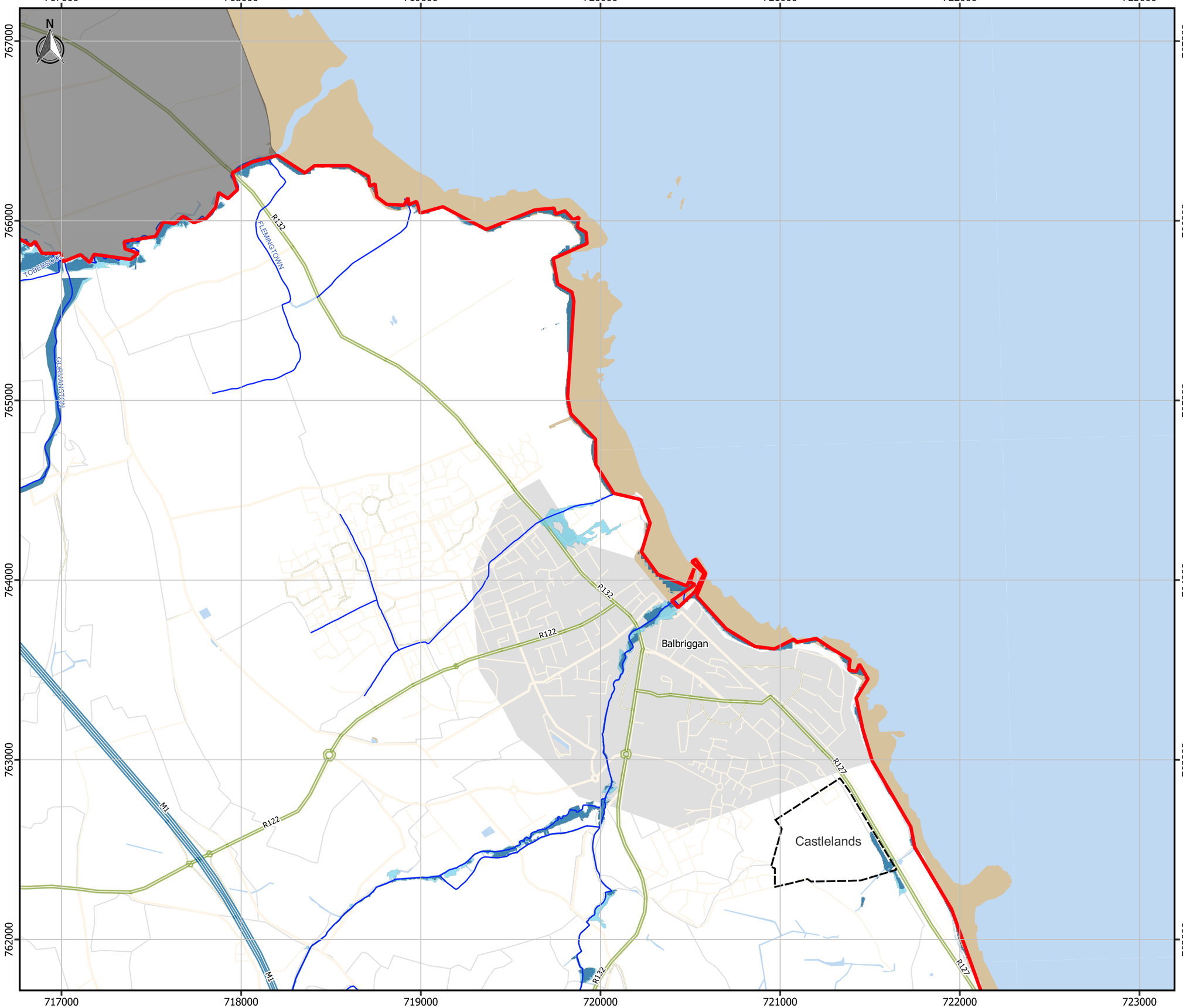

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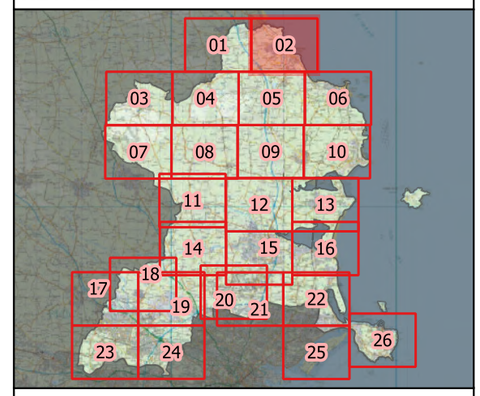

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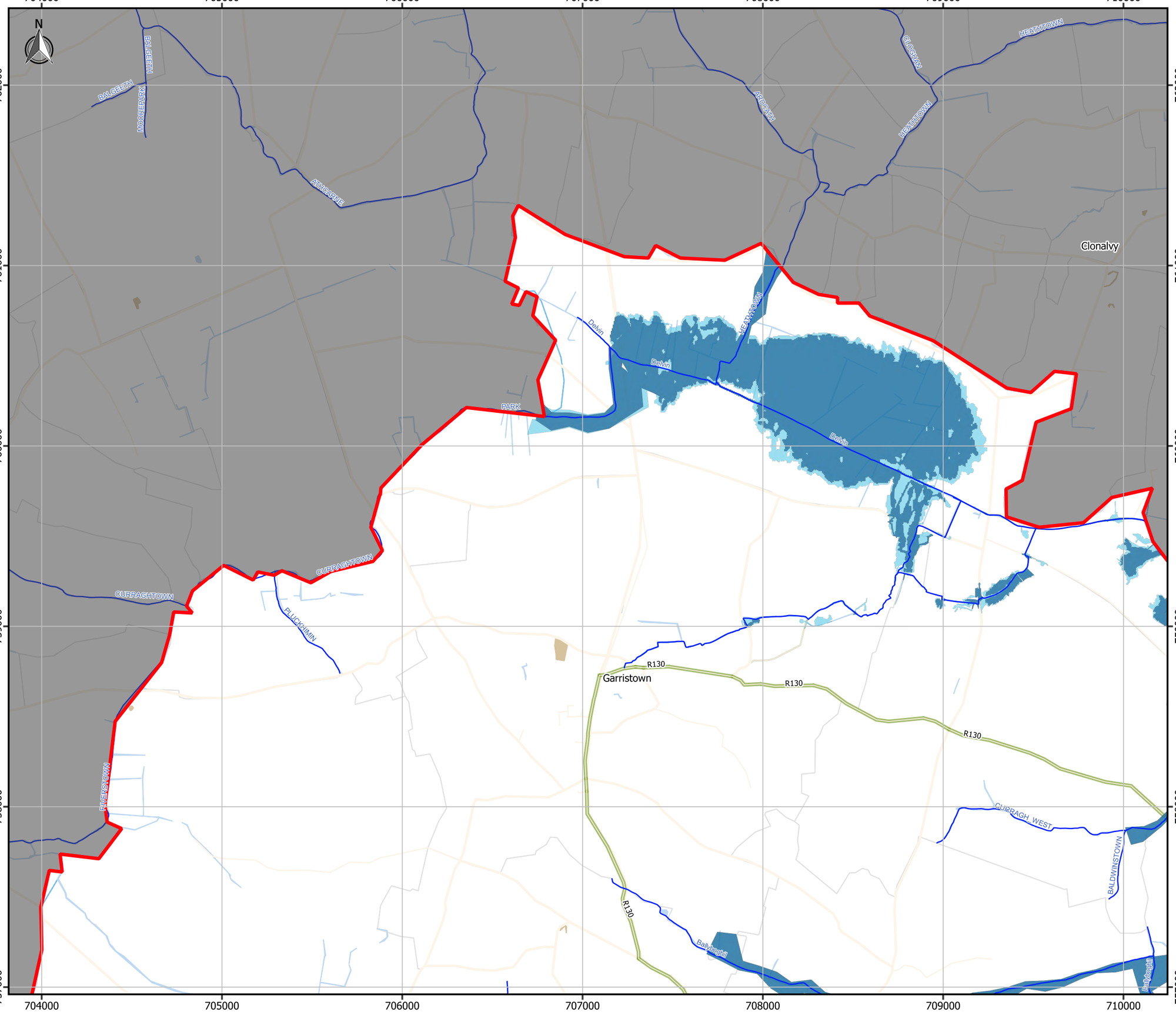

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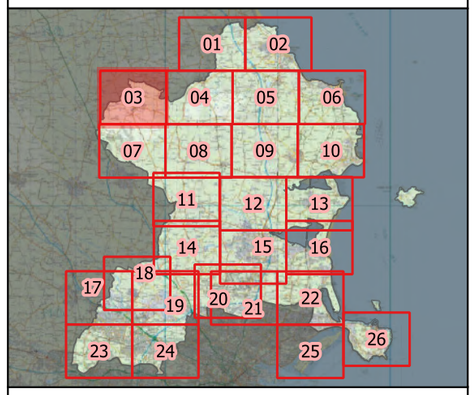

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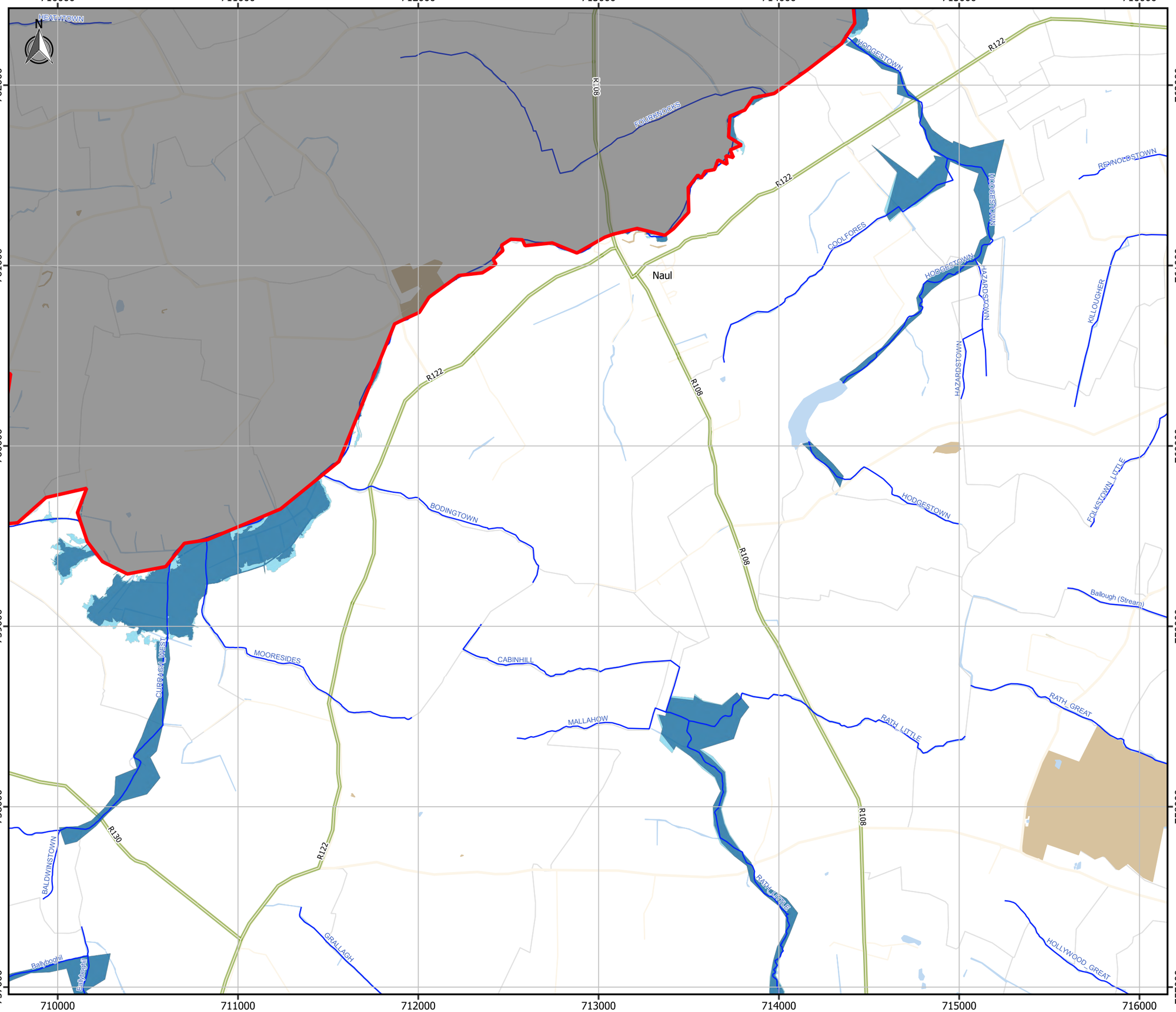

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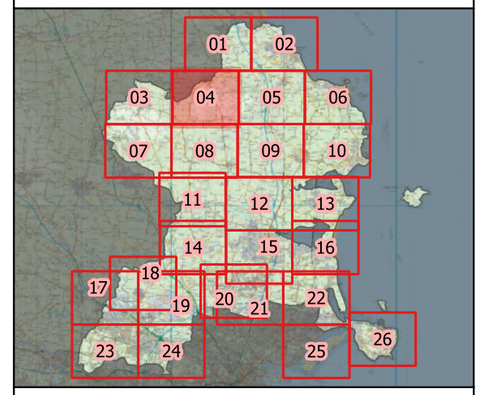

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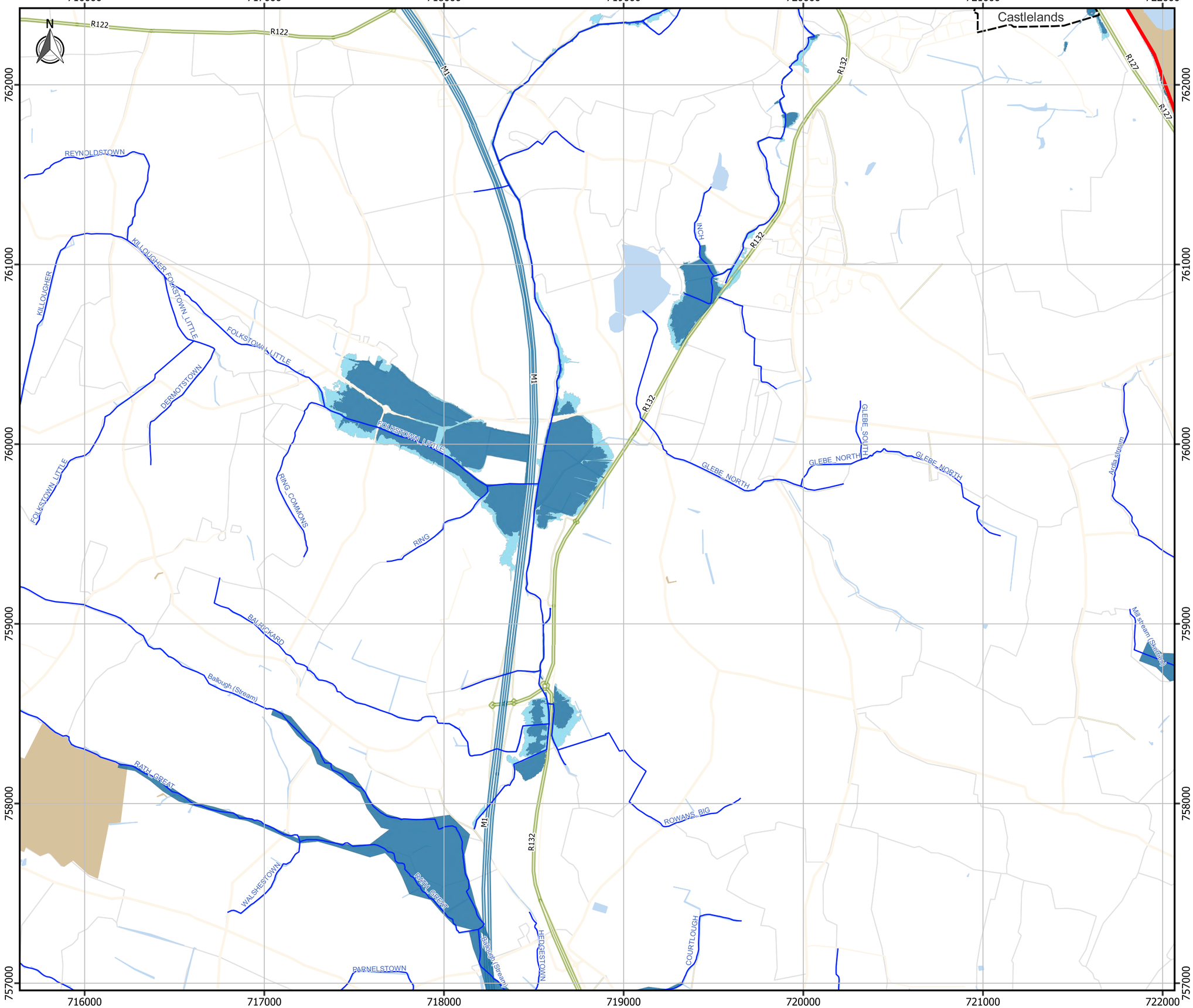

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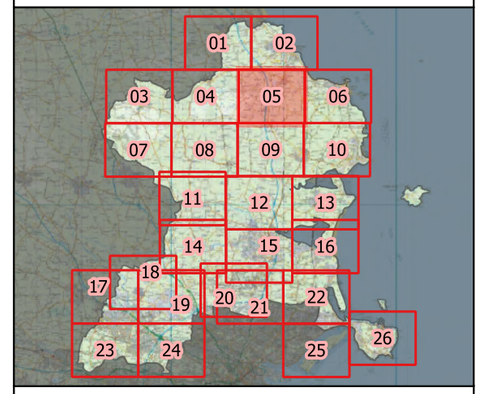

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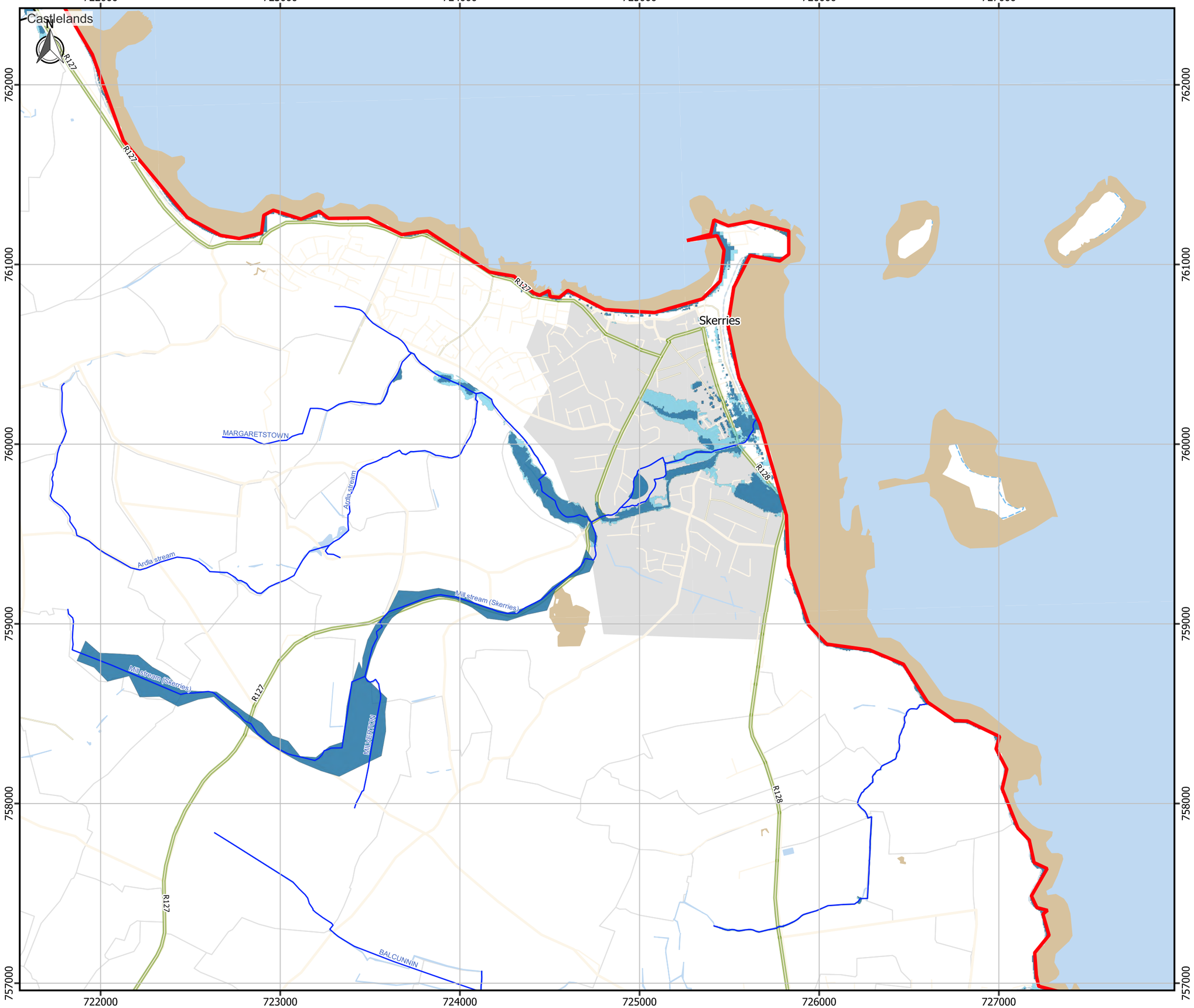

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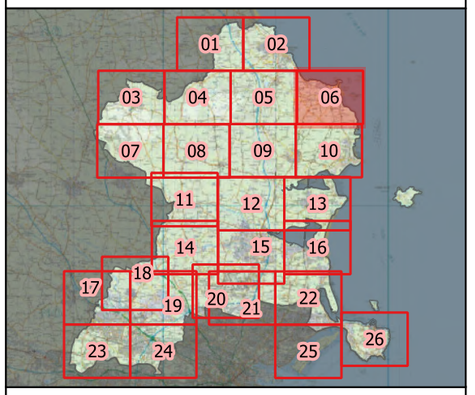

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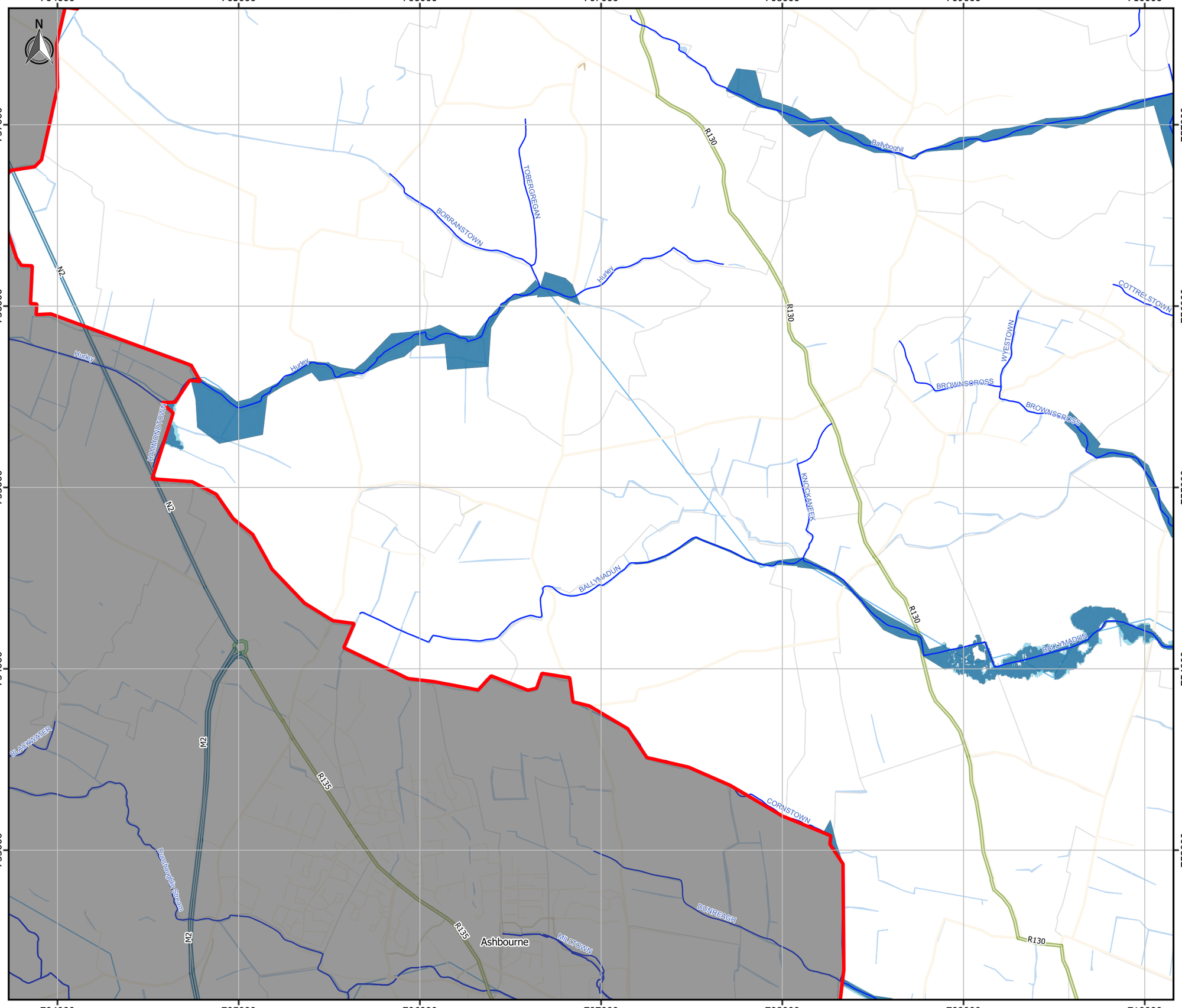

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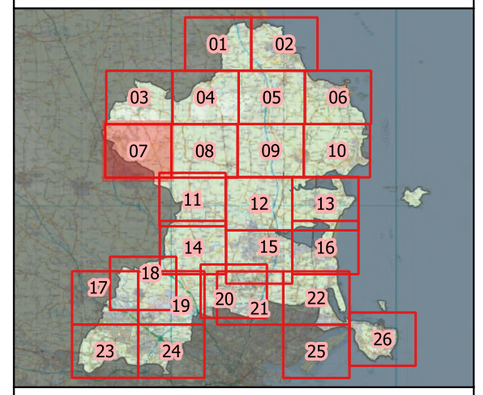

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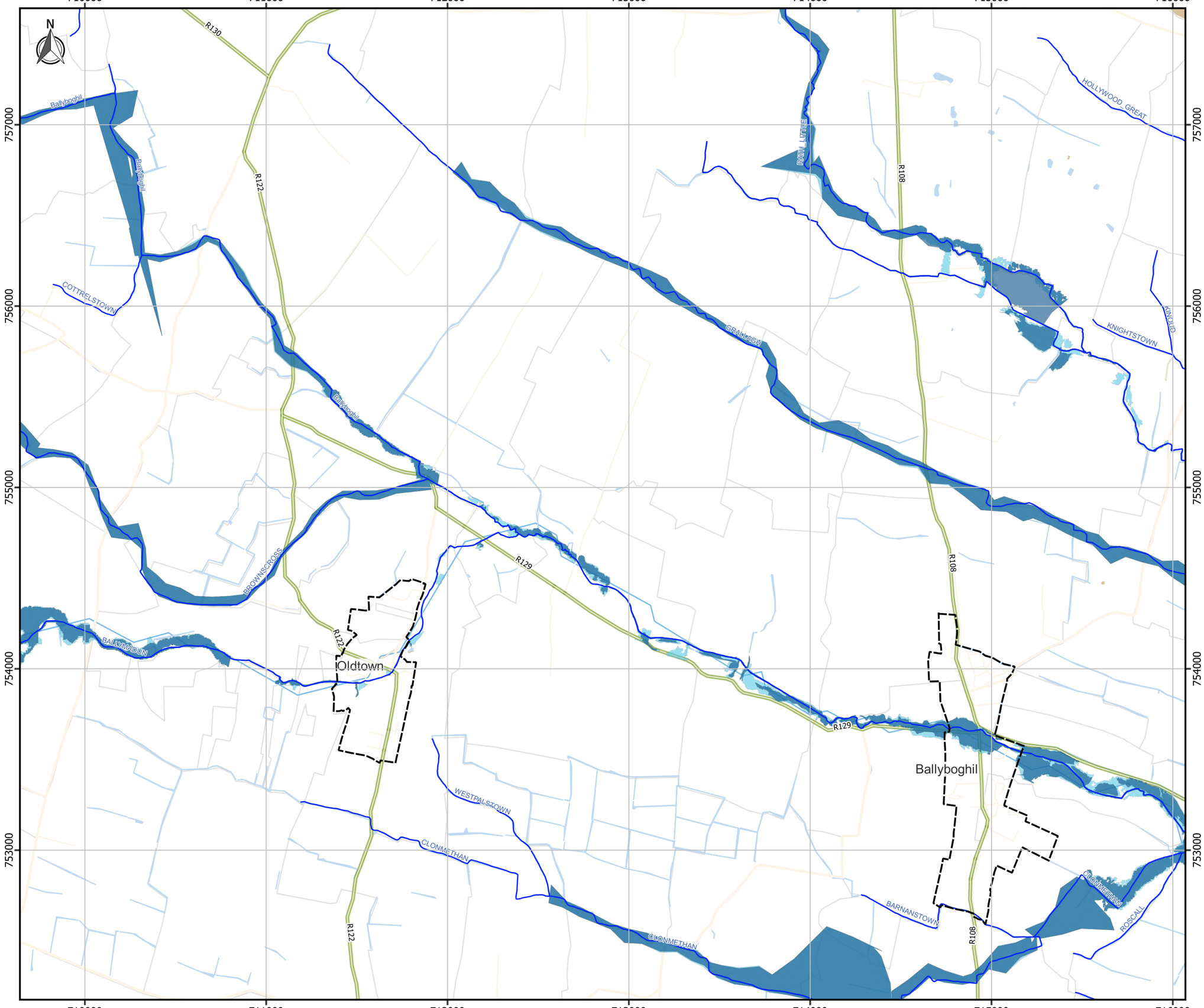

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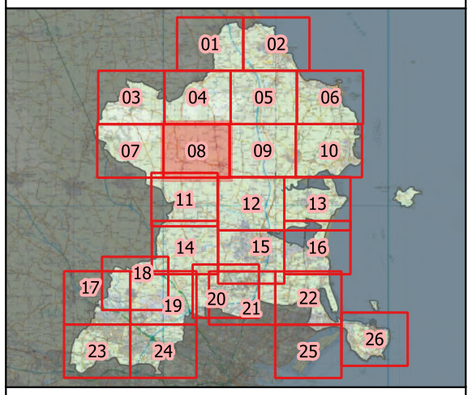

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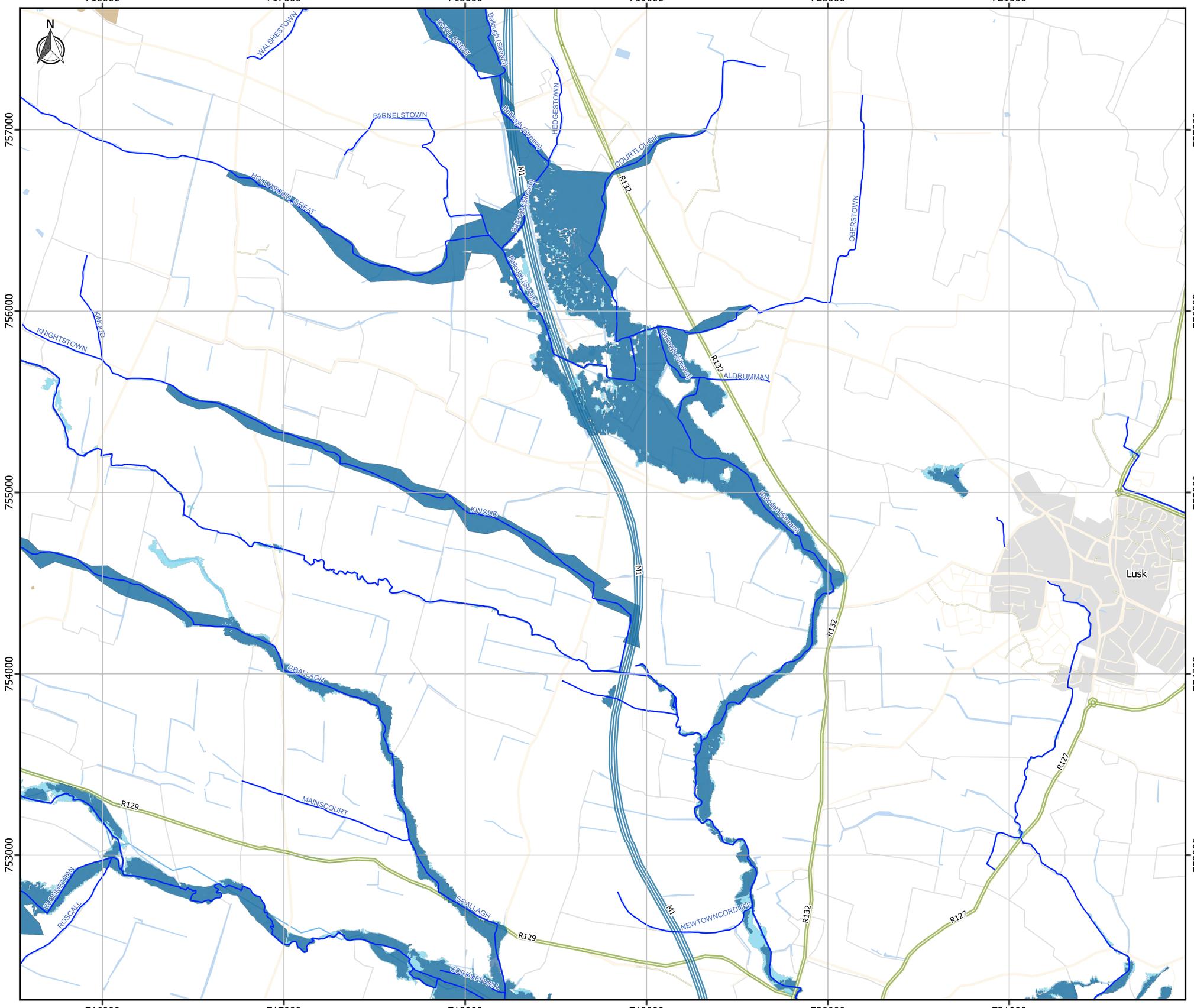

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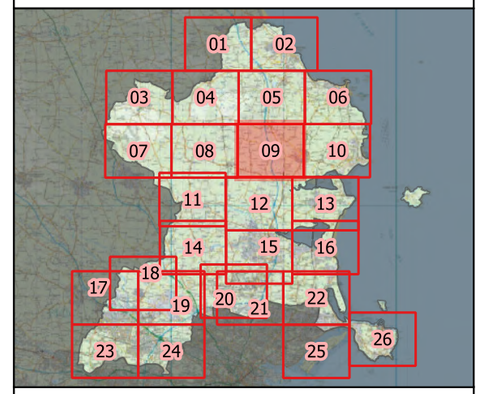

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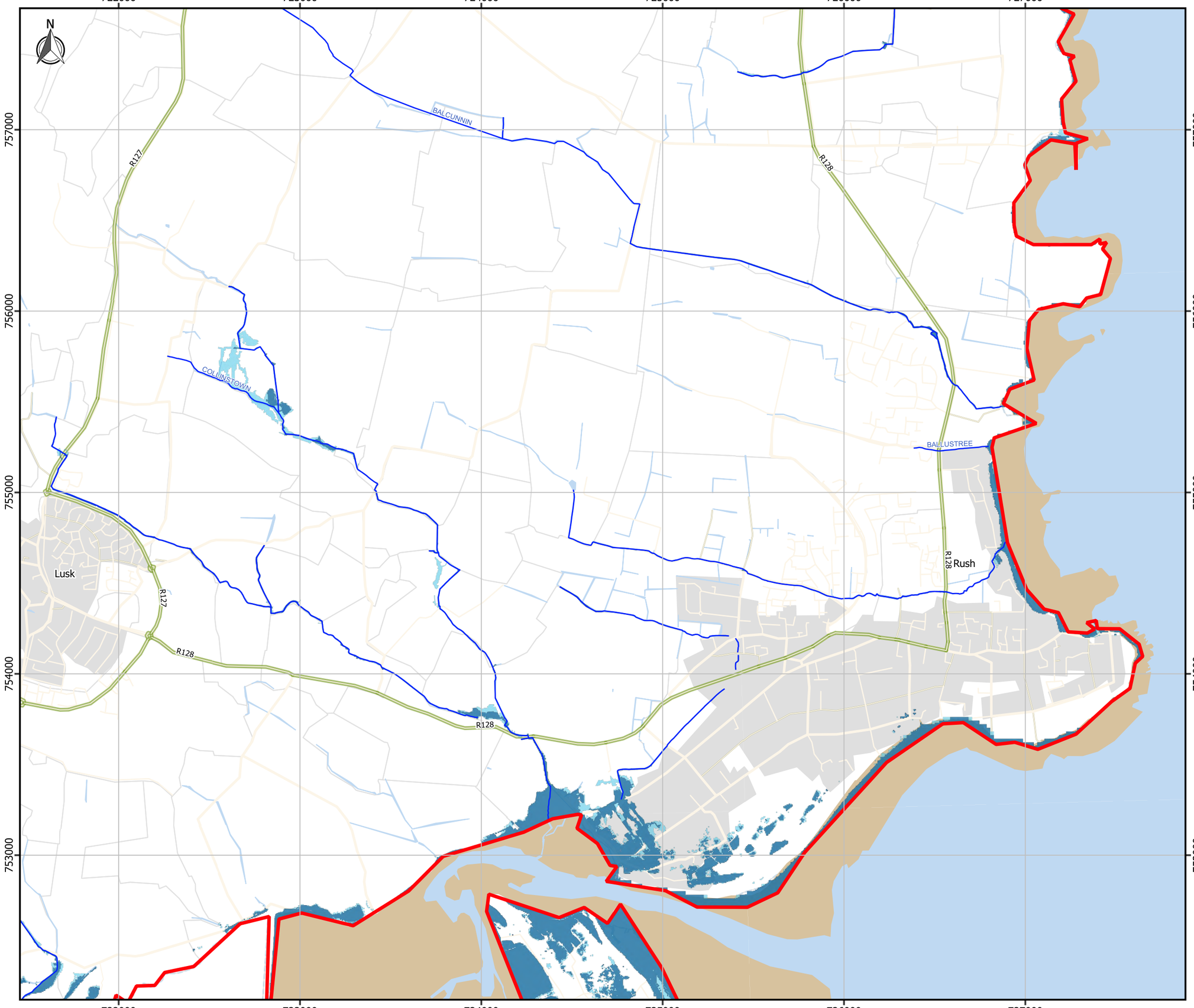

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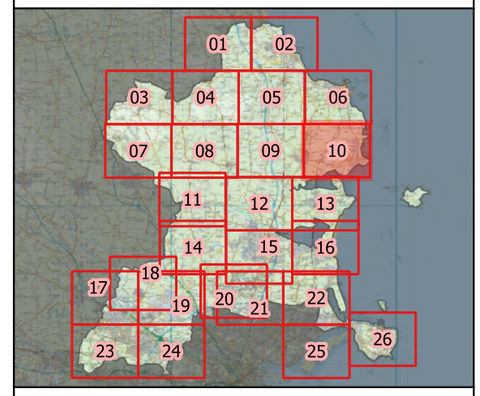

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CLONMETHAN WESTPALSTOWN BARNANSTOWN CLONMETHAN

CORNSTOWN DONAGHMORE CORNSTOWN

Ballyboghil

Kilsallaghan

GREENOGE MUCKERSTOWN RATH RATH RATH RATH

KILSALLAGHAN CASTLEFARM KILLOSSERY

BOGGYHEARY MOUNTSTUART MOUNTSTUART ROGANSTOWN ROGANSTOWN

BALCULTRY LEAS TONLEGEE

BOWLESTOWN-WEST SURGALSTOWN-NORTH MOUNTAMBROSE_LITTLE

FIELDSTOWN DUNMUCKY

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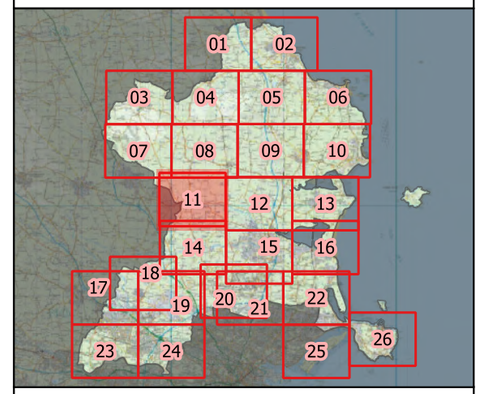

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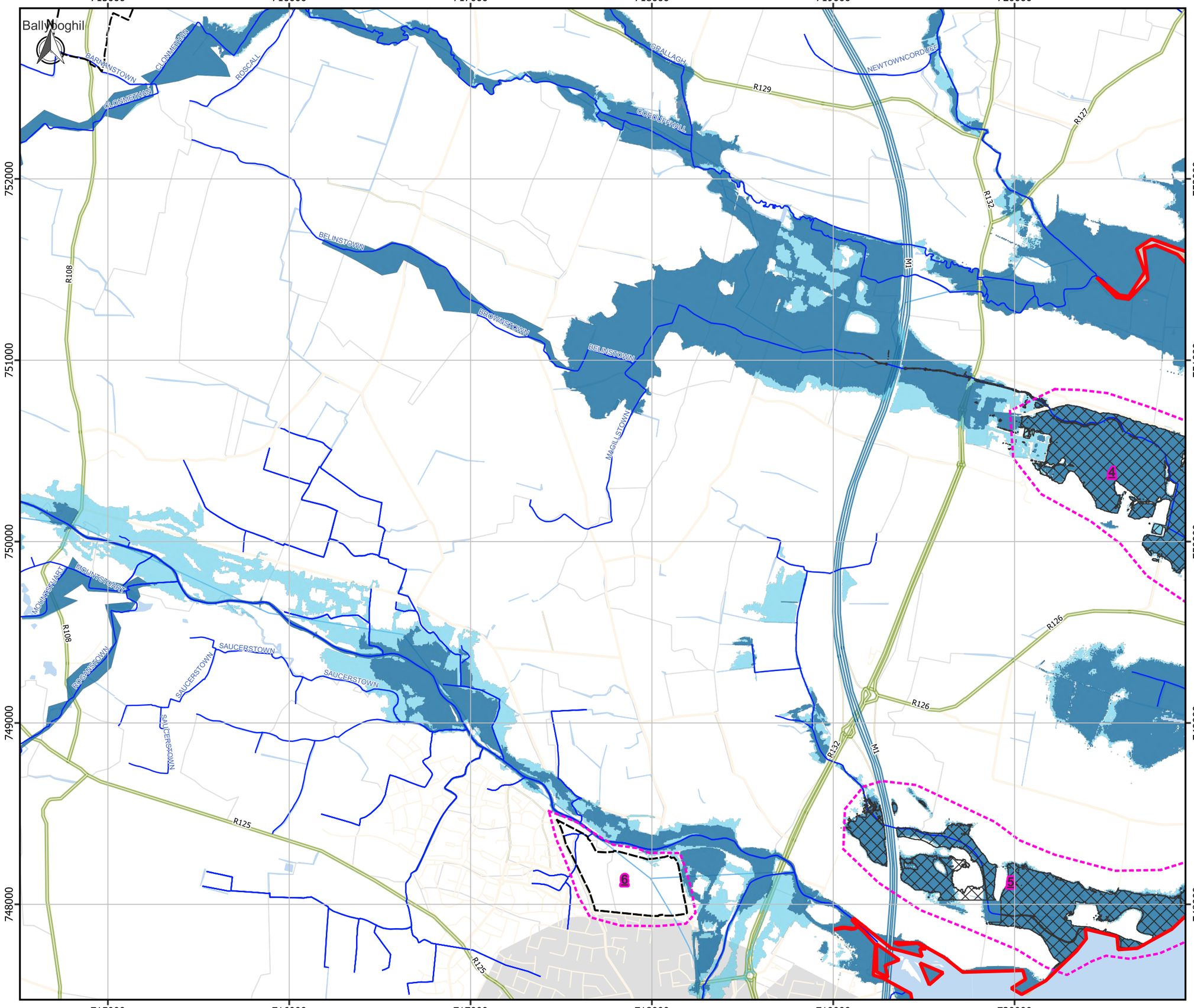
MAP:	FLOOD ZONE MAP	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 22/02/2022
CHECKED BY:	PS	DATE: 22/02/2022
APPROVED BY:	DKS	DATE: 22/02/2022
DRAWING NUMBER:	M02127-06_FIG_FL111	
MAP SERIES:		PAGE 11 OF 26
DRAWING SCALE:		1:20000 @ A3



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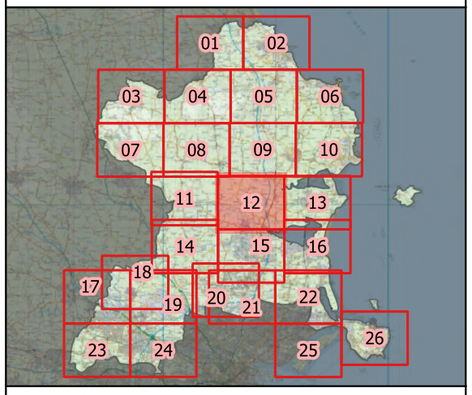

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- Flood Zone A
- Flood Zone B
- Defended Areas
- Area for Further Consideration

REV:	NOTE:	DATE:
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MAP:	FLOOD ZONE MAP	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 22/02/2022
CHECKED BY:	PS	DATE: 22/02/2022
APPROVED BY:	DKS	DATE: 22/02/2022
DRAWING NUMBER:	M02127-06_FIG_FL112	
MAP SERIES:		PAGE 12 OF 26
DRAWING SCALE:		1:20000 @ A3

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752000 751000 750000 749000 748000

N

R127

RAHILLION

BALLALEASE NORTH

Rahillion

Turvey

R126

Ballymastone

Donabate

Corballis East

Corballis Nature Park

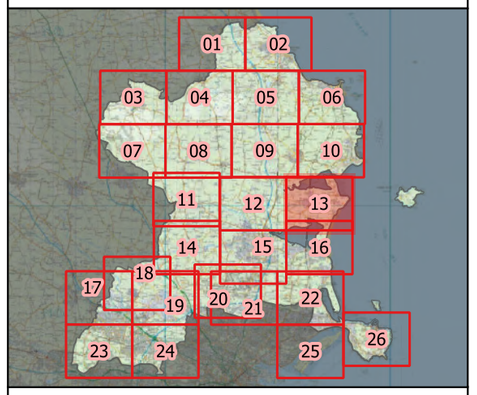
LANESTOWN

BALLALEASE

1 2 3 4 5

0 0.5 1 km

KEY PLAN



LEGEND

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MAP:	FLOOD ZONE MAP	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 22/02/2022
CHECKED BY:	PS	DATE: 22/02/2022
APPROVED BY:	DKS	DATE: 22/02/2022
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MAP SERIES:		PAGE 13 OF 26
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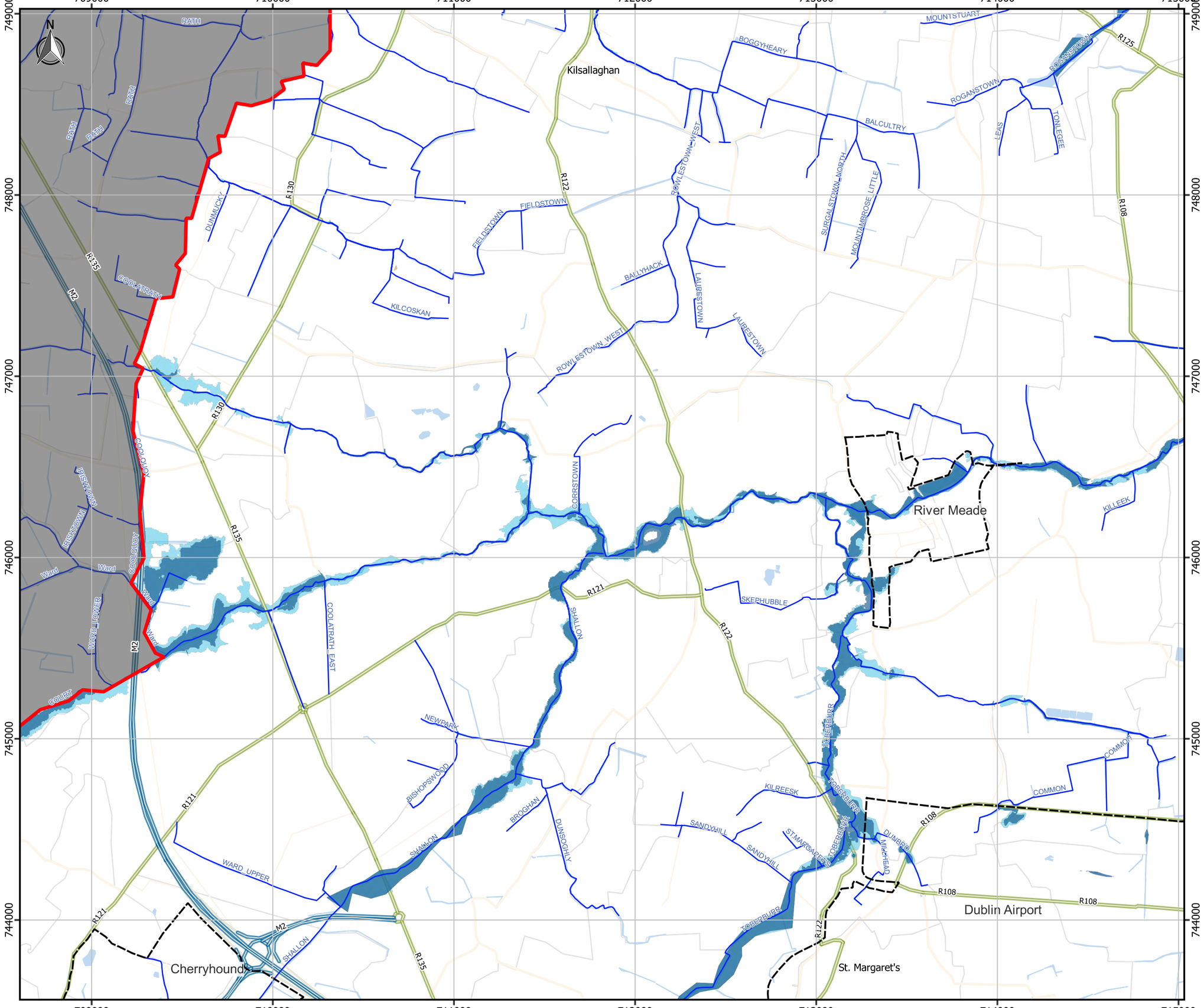

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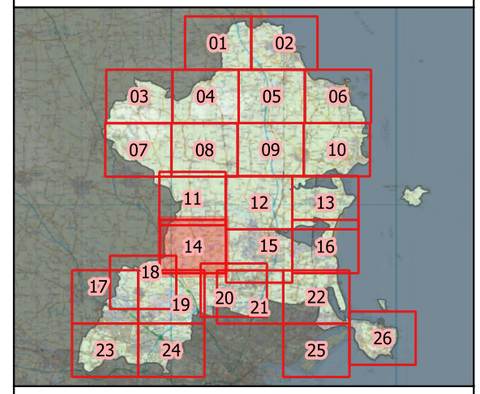

LEGEND

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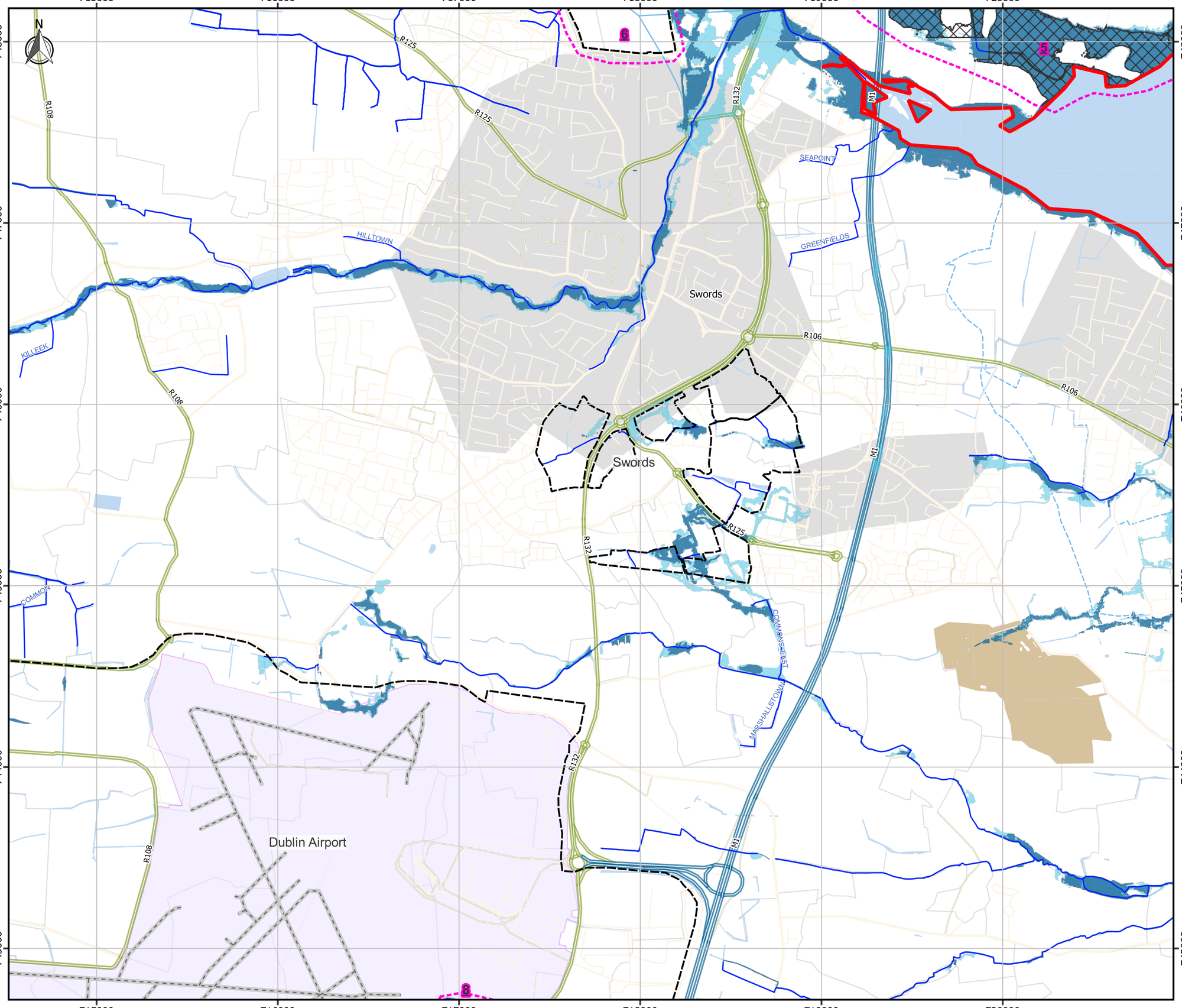
MAP:	FLOOD ZONE MAP	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 22/02/2022
CHECKED BY:	PS	DATE: 22/02/2022
APPROVED BY:	DKS	DATE: 22/02/2022
DRAWING NUMBER:	M02127-06_FIG_FL114	
MAP SERIES:		PAGE 14 OF 26
DRAWING SCALE:		1:20000 @ A3



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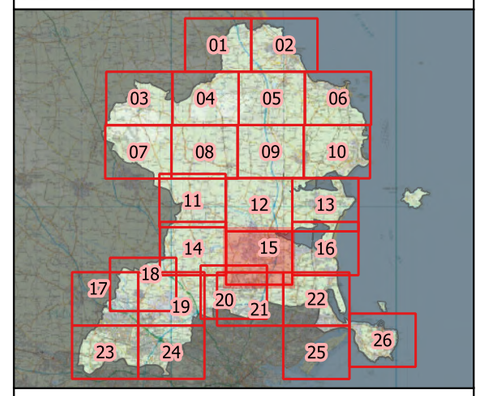

LEGEND

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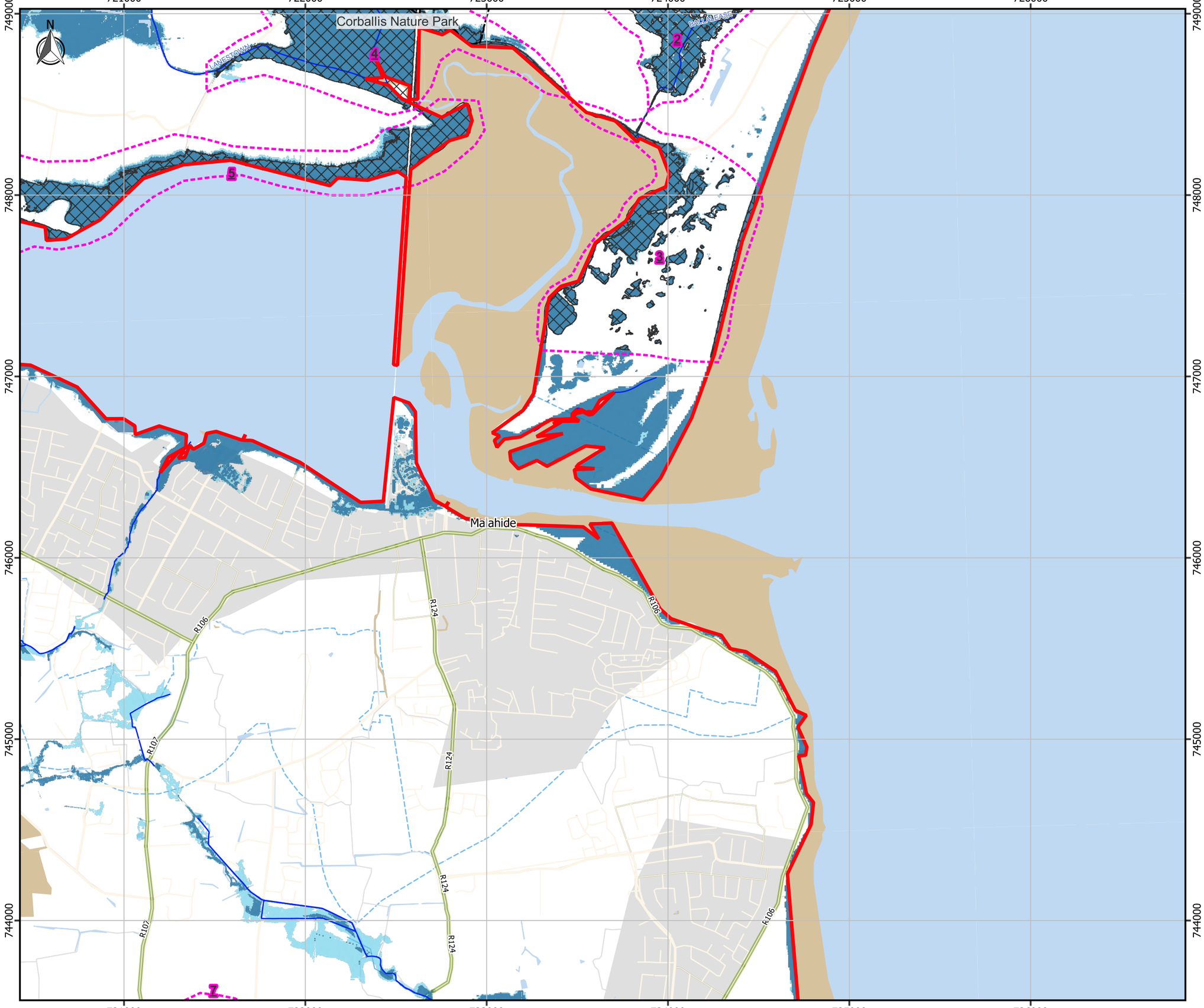
MAP:	FLOOD ZONE MAP	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 22/02/2022
CHECKED BY:	PS	DATE: 22/02/2022
APPROVED BY:	DKS	DATE: 22/02/2022
DRAWING NUMBER:	M02127-06_FIG_FL115	
MAP SERIES:		PAGE 15 OF 26
DRAWING SCALE:		1:20000 @ A3



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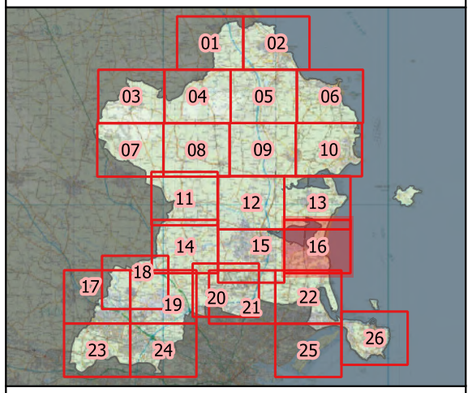

LEGEND

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MAP:	FLOOD ZONE MAP	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
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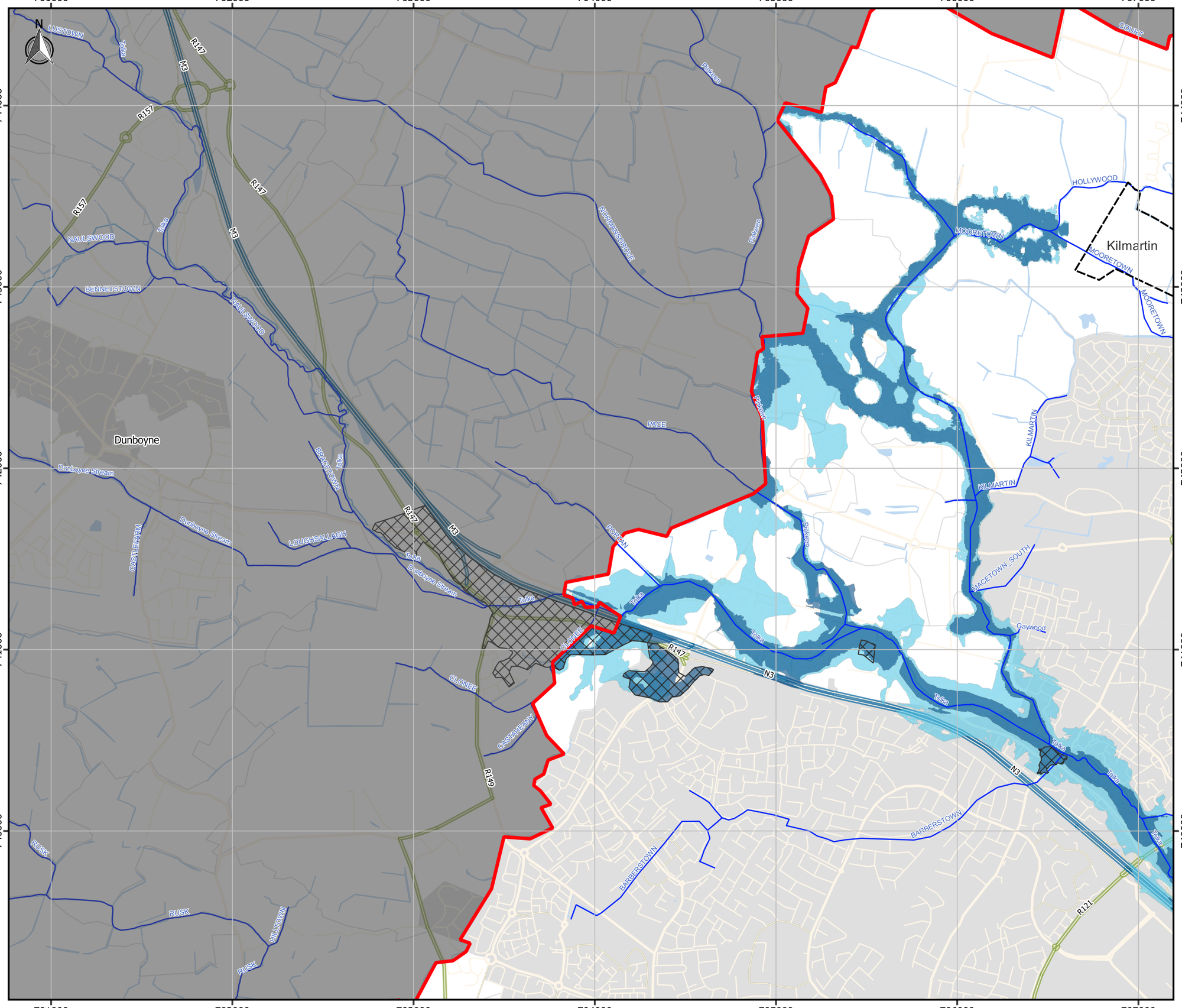
CHECKED BY:	PS	DATE: 22/02/2022
APPROVED BY:	DKS	DATE: 22/02/2022
DRAWING NUMBER:	M02127-06_FIG_FL116	
MAP SERIES:		PAGE 16 OF 26
DRAWING SCALE:		1:20000 @ A3



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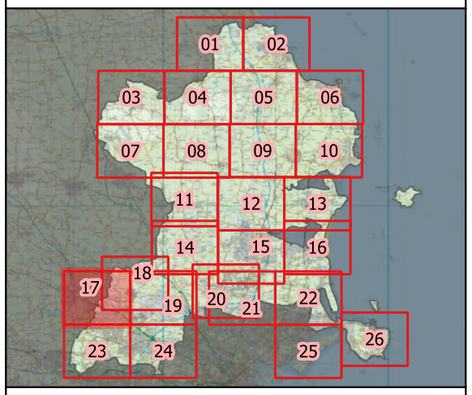

LEGEND

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MAP:	FLOOD ZONE MAP	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
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CHECKED BY:	PS	DATE: 22/02/2022
APPROVED BY:	DKS	DATE: 22/02/2022
DRAWING NUMBER:	M02127-06_FIG_FL117	
MAP SERIES:		PAGE 17 OF 26
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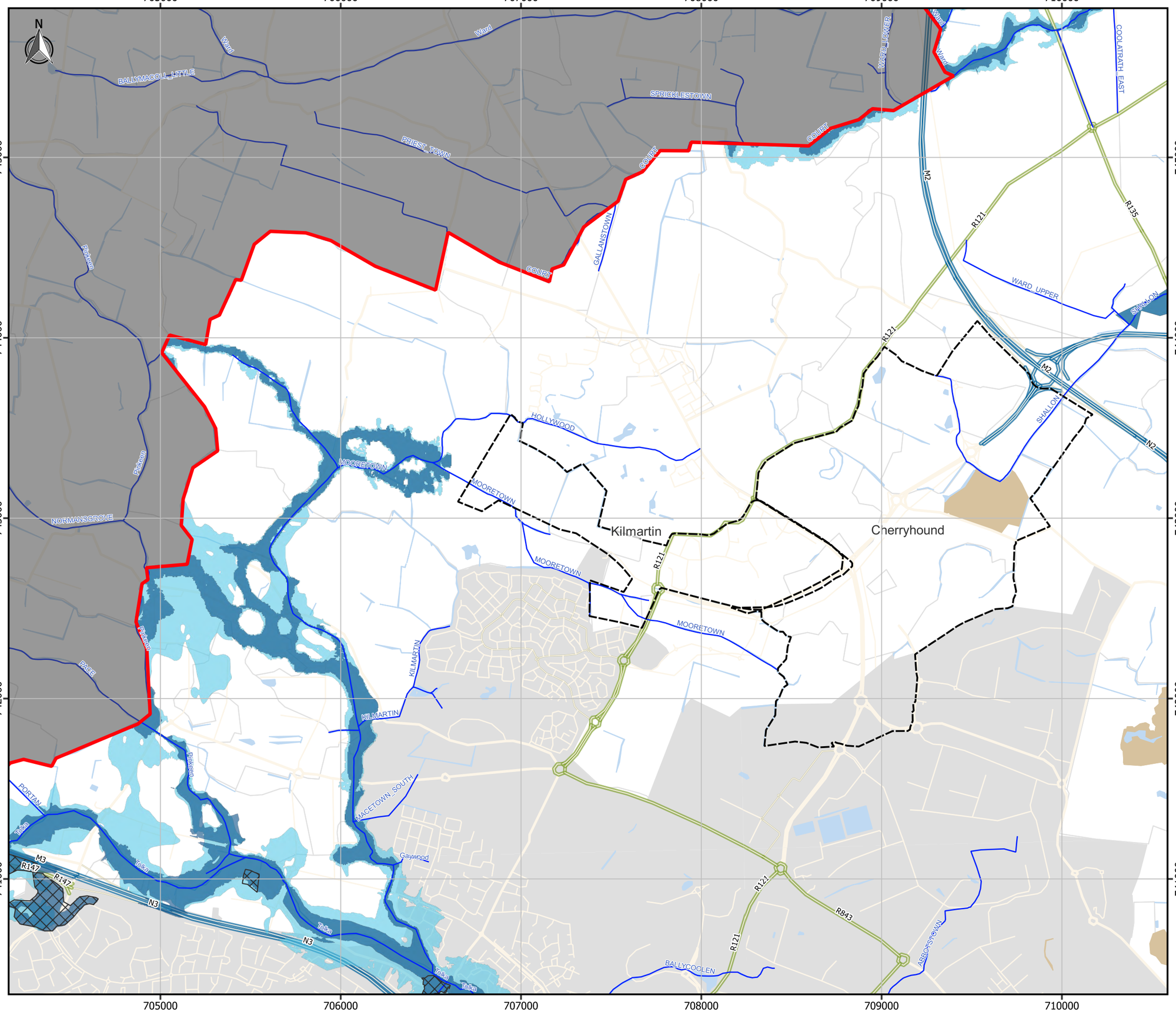

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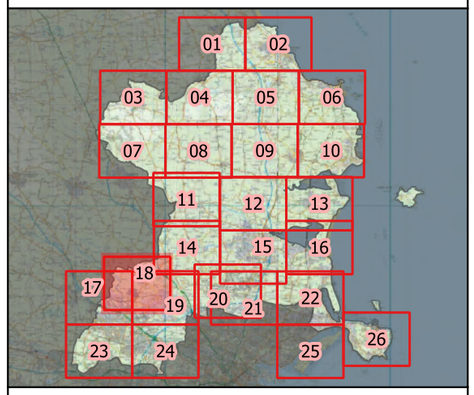

LEGEND

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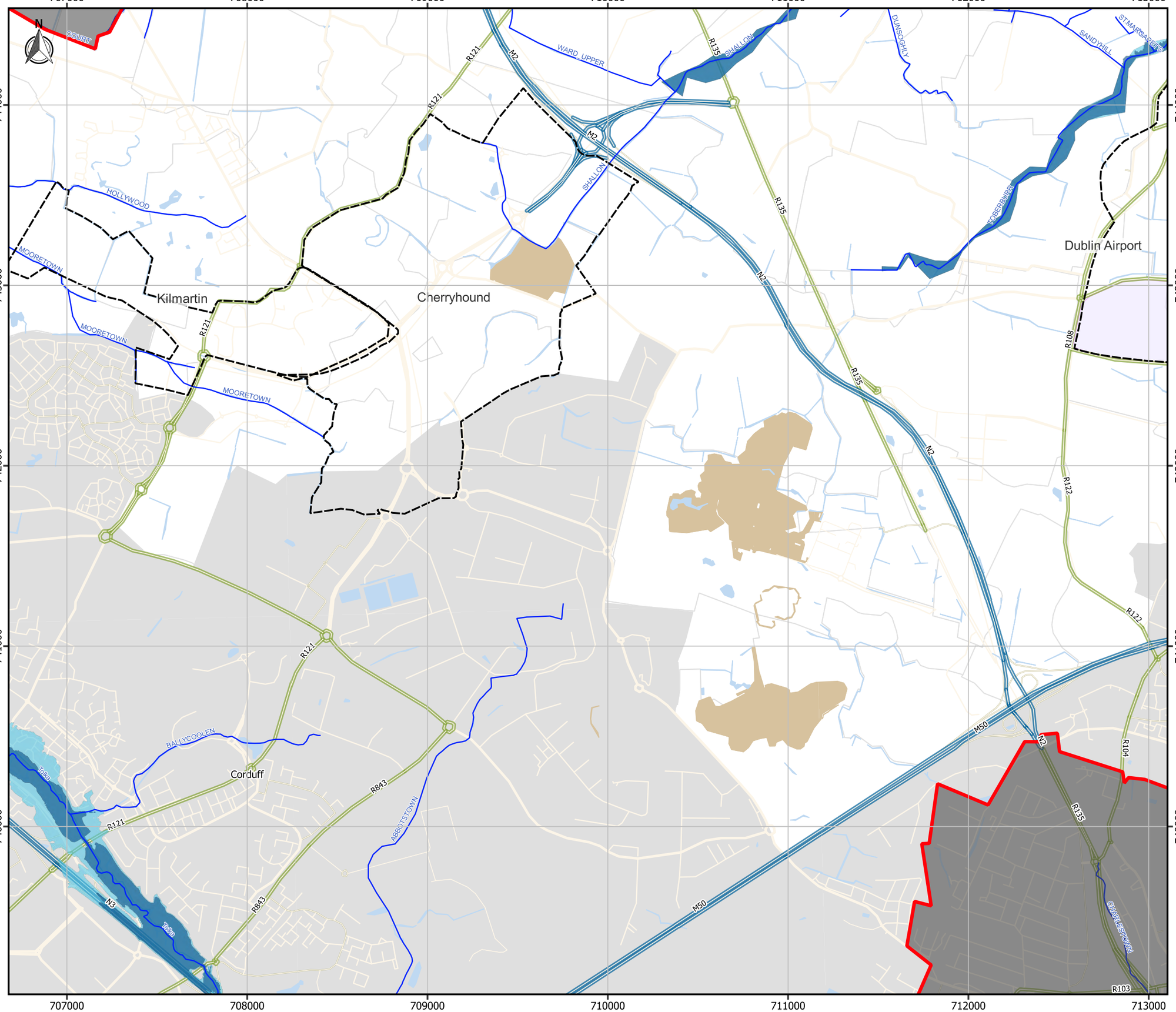
MAP:	FLOOD ZONE MAP	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 22/02/2022
CHECKED BY:	PS	DATE: 22/02/2022
APPROVED BY:	DKS	DATE: 22/02/2022
DRAWING NUMBER:	M02127-06_FIG_FL118	
MAP SERIES:		PAGE 18 OF 26
DRAWING SCALE:		1:20000 @ A3



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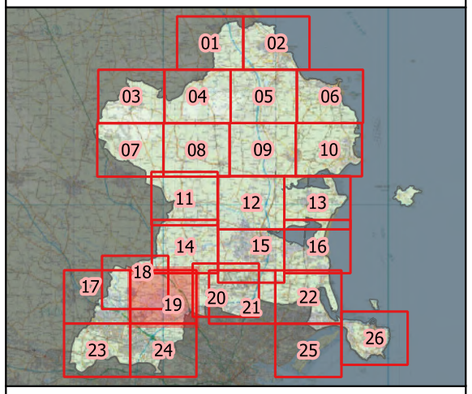

LEGEND

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MAP:	FLOOD ZONE MAP	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 22/02/2022
CHECKED BY:	PS	DATE: 22/02/2022
APPROVED BY:	DKS	DATE: 22/02/2022
DRAWING NUMBER:	M02127-06_FIG_FL119	
MAP SERIES:		PAGE 19 OF 26
DRAWING SCALE:		1:20000 @ A3

713000 714000 715000 716000 717000 718000

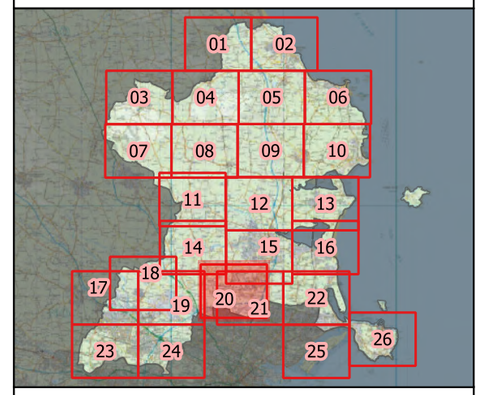
745000 744000 743000 742000 741000 740000

N

KILREESK
SANDYHILL
SANDYHILL
TOBERBURR
TOBERBURR
TOBERBURR
TOBERBURR
ST MARGARETS
MILLHEAD
DUNBRO
COMMON
COMMON
R122
R108
R122
R108
R108
R132
R132
M1
St. Margaret's
Dublin Airport
Dardistown
Poppintree
Santry
Santry
Santry
BALLYMUN
Santry
R122
M50
M50
M50
M50
M50
M1
R108
R104
R104
R132
R132
R104
R139
N2, R135
8

0 0.5 1 km

KEY PLAN



LEGEND

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MAP:	FLOOD ZONE MAP	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
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CHECKED BY:	PS	DATE: 22/02/2022
APPROVED BY:	DKS	DATE: 22/02/2022
DRAWING NUMBER:	M02127-06_FIG_FL120	
MAP SERIES:		PAGE 20 OF 26
DRAWING SCALE:		1:20000 @ A3

714000 715000 716000 717000 718000 719000 720000

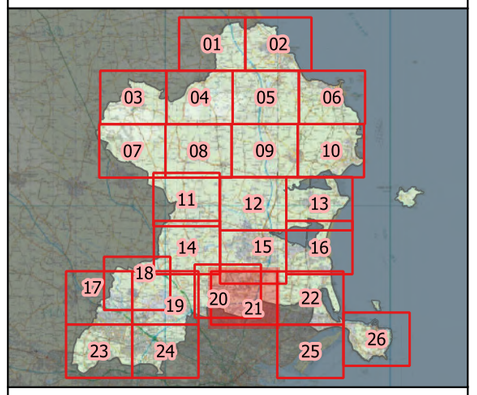
744000 743000 742000 741000 740000

Dublin Airport
Dardistown
Poppintree
Santry
Ballymun
Glasnevin North
Kilmore
Coolock

R108 R132 R139 R104 R103 R107
M1 M50 MARSHALLSTOWN BALLYMUN Santry
8

0 0.5 1 km

KEY PLAN



LEGEND

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MAP:	FLOOD ZONE MAP	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
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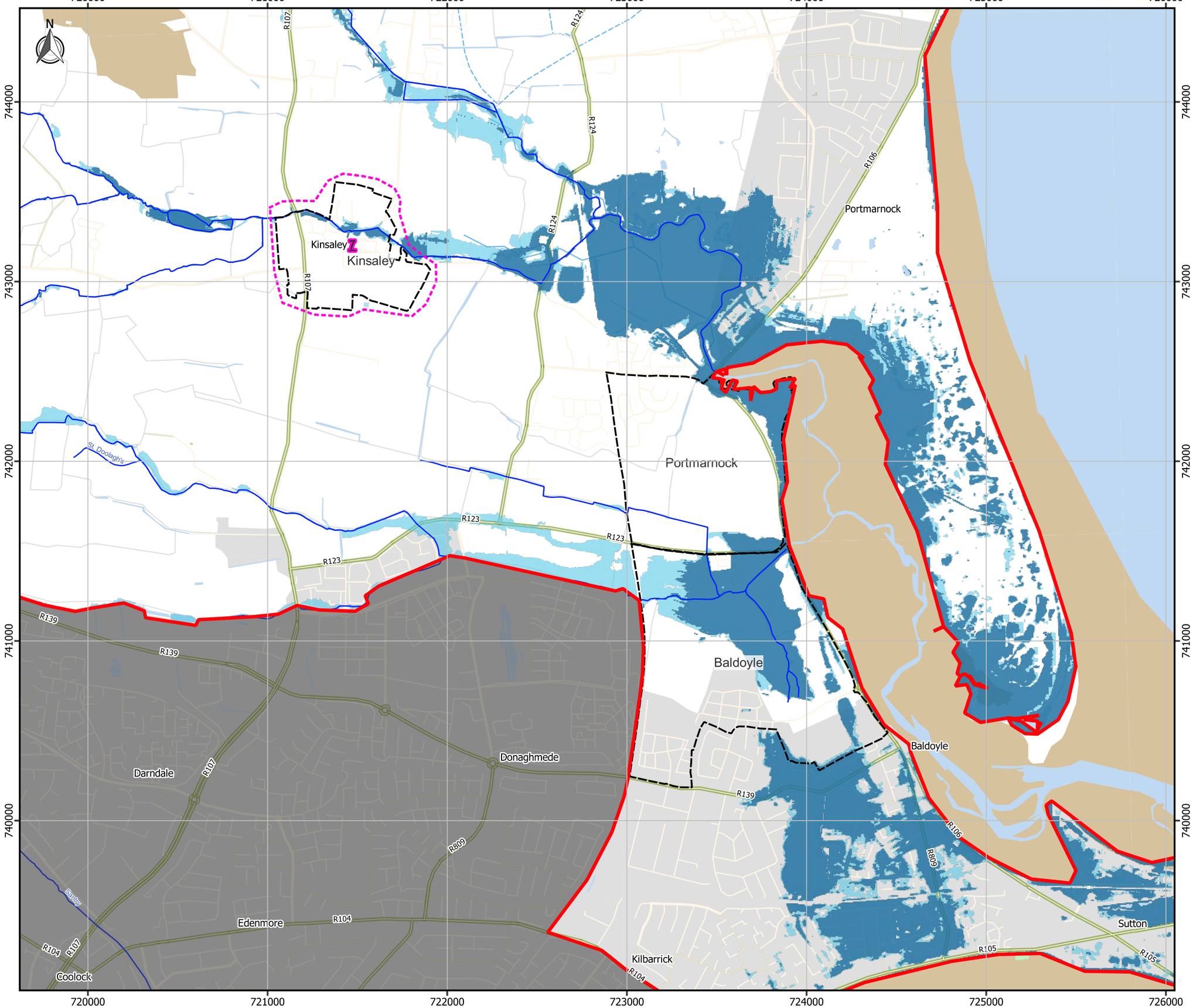
CHECKED BY:	PS	DATE: 22/02/2022
APPROVED BY:	DKS	DATE: 22/02/2022
DRAWING NUMBER:	M02127-06_FIG_FL121	
MAP SERIES:		PAGE 21 OF 26
DRAWING SCALE:		1:20000 @ A3



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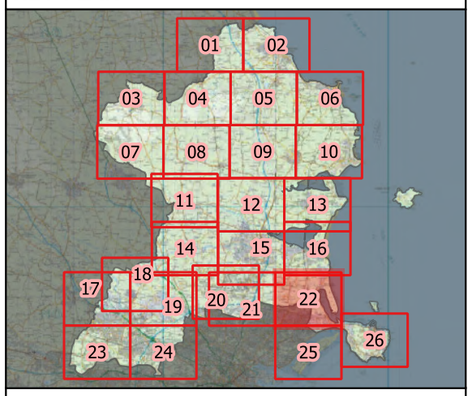

LEGEND

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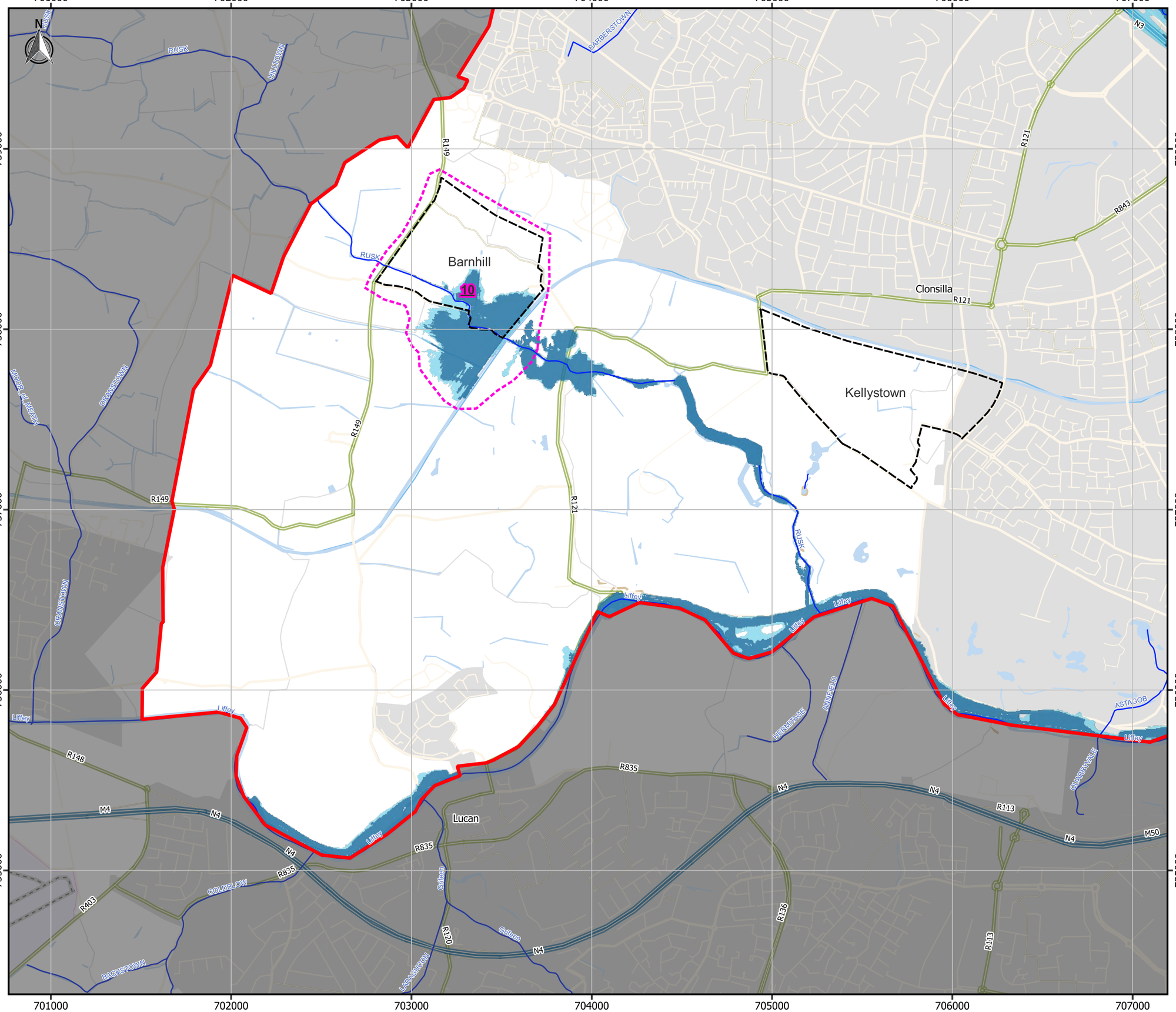
MAP:	FLOOD ZONE MAP	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 22/02/2022
CHECKED BY:	PS	DATE: 22/02/2022
APPROVED BY:	DKS	DATE: 22/02/2022
DRAWING NUMBER:	M02127-06_FIG_FL122	
MAP SERIES:		PAGE 22 OF 26
DRAWING SCALE:		1:20000 @ A3



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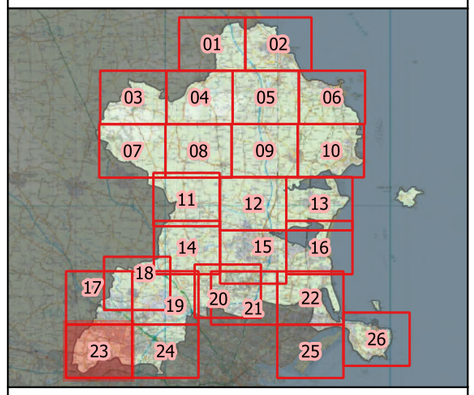

LEGEND

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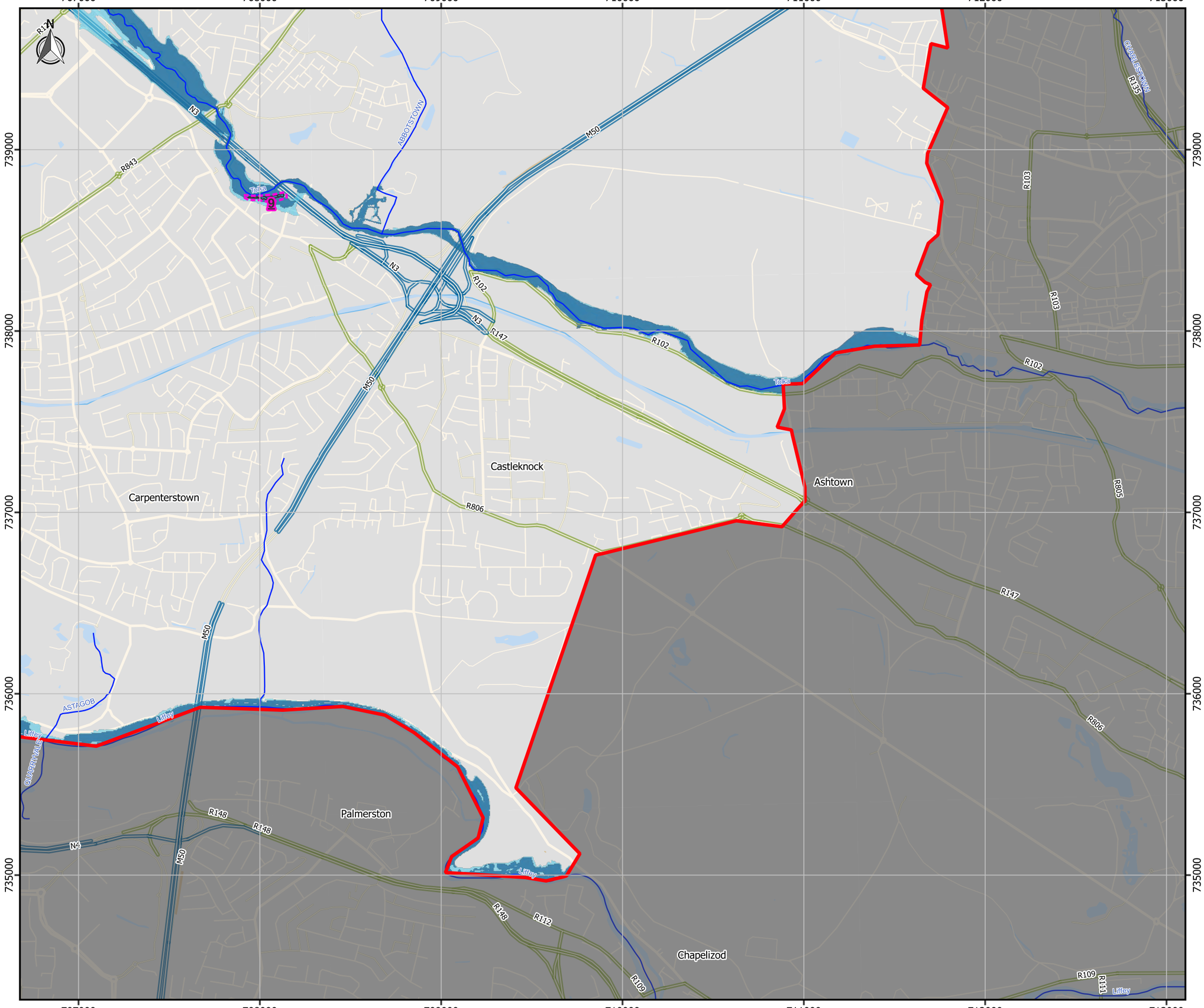
MAP:	FLOOD ZONE MAP	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 22/02/2022
CHECKED BY:	PS	DATE: 22/02/2022
APPROVED BY:	DKS	DATE: 22/02/2022
DRAWING NUMBER:	M02127-06_FIG_FL123	
MAP SERIES:		PAGE 23 OF 26
DRAWING SCALE:		1:20000 @ A3



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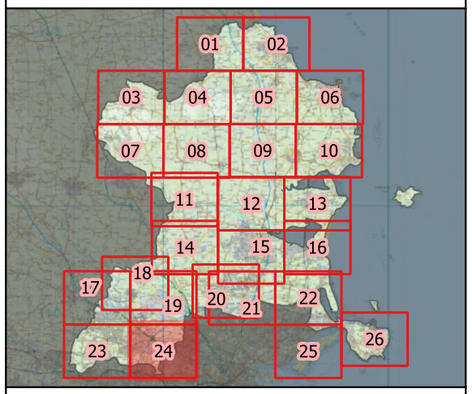

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MAP:	FLOOD ZONE MAP	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 22/02/2022
CHECKED BY:	PS	DATE: 22/02/2022
APPROVED BY:	DKS	DATE: 22/02/2022
DRAWING NUMBER:	M02127-06_FIG_FL124	
MAP SERIES:		PAGE 24 OF 26
DRAWING SCALE:		1:20000 @ A3

720000 721000 722000 723000 724000 725000 726000

739000 738000 737000 736000 735000

N

R107 R104 R809 R808 R807 R105 R106

Edenmore

Coolock

Kilbarrick

Sutton

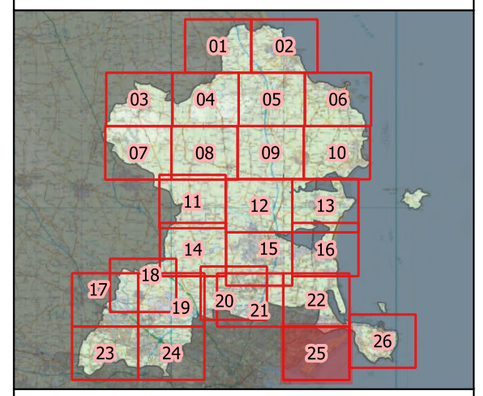
Raheny

Dollymount

Santry

0 0.5 1 km

KEY PLAN



LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- Flood Zone A
- Flood Zone B
- Defended Areas
- Area for Further Consideration

REV:	NOTE:	DATE:
03	DRAFT ISSUE	22/02/2022

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W: www.mccloyconsulting.ie

MAP: FLOOD ZONE MAP

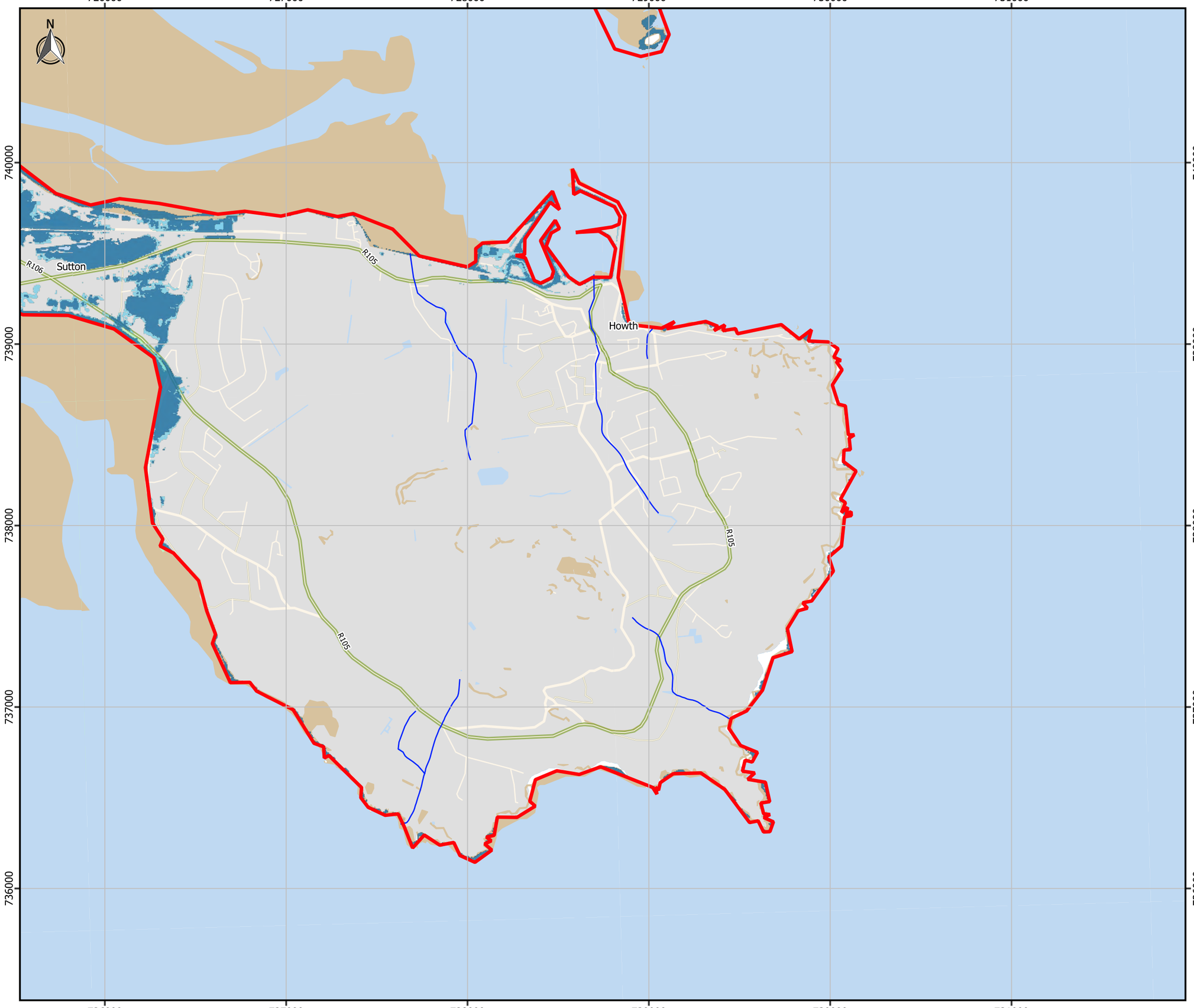
FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 22/02/2022
CHECKED BY:	PS	DATE: 22/02/2022
APPROVED BY:	DKS	DATE: 22/02/2022

DRAWING NUMBER: M02127-06_FIG_FL125

MAP SERIES:	PAGE 25 OF 26
DRAWING SCALE:	1:20000 @ A3



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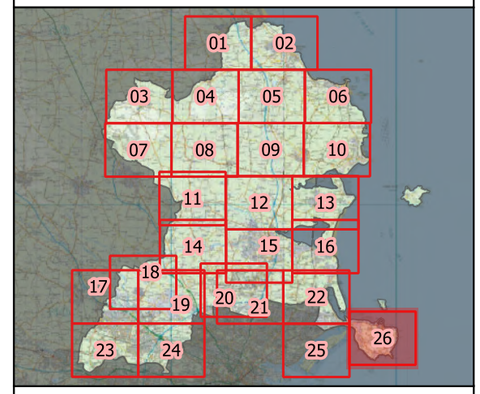

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- Flood Zone A
- Flood Zone B
- Defended Areas
- Area for Further Consideration

REV:	NOTE:	DATE:
03	DRAFT ISSUE	22/02/2022

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MAP:	FLOOD ZONE MAP	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 22/02/2022
CHECKED BY:	PS	DATE: 22/02/2022
APPROVED BY:	DKS	DATE: 22/02/2022
DRAWING NUMBER:	M02127-06_FIG_FL126	
MAP SERIES:		PAGE 26 OF 26
DRAWING SCALE:		1:20000 @ A3

Appendix B

Mid-Range Future Scenario -

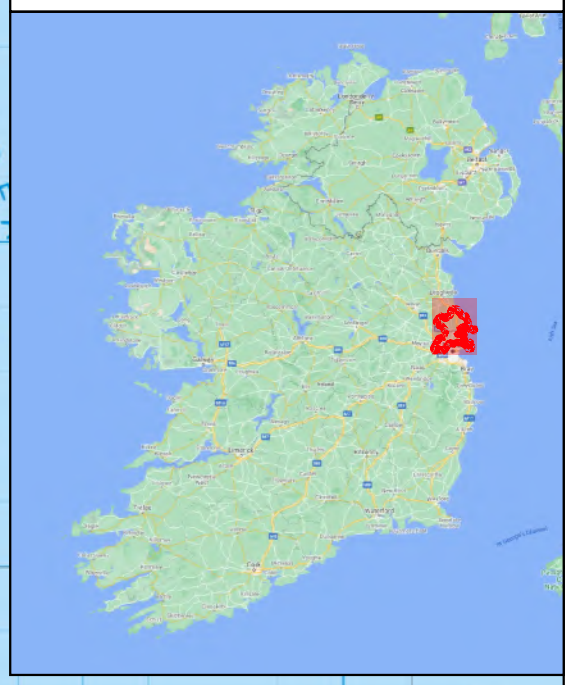
Climate Change Flood Extents Maps

LEGEND

Fingal County Administrative Boundary

Overview Map Page Number Reference

KEY PLAN



N

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

BALBRIGGAN Baile Brigín

SKERRIES Na Sceirí

Lambay Island

IRISH SEA Muir Éireann

DUBLIN

701000 711000 721000 731000

765000 755000 745000 735000

0 2.5 5 km

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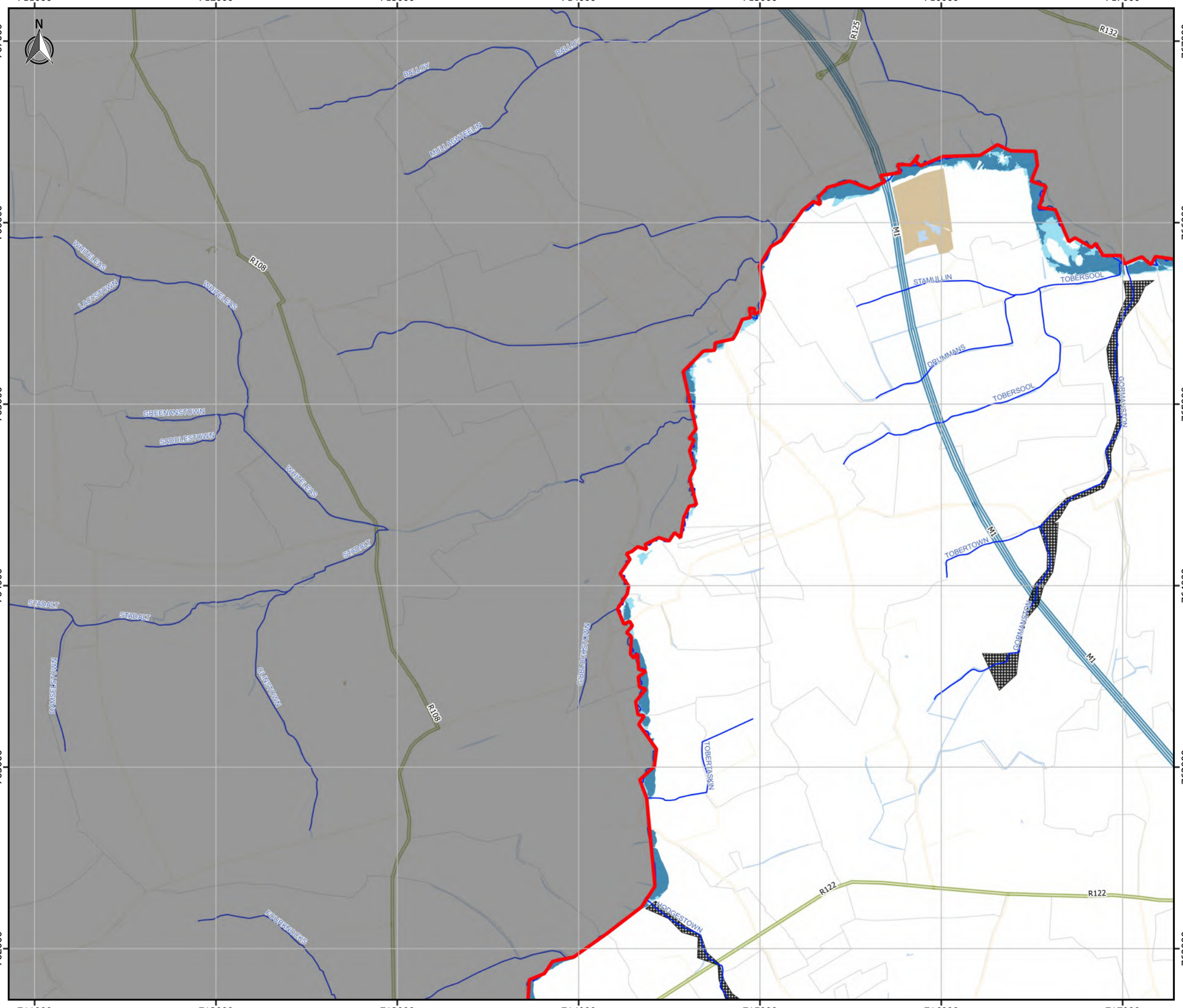
MAP: SFRA FLOOD MAP OVERVIEW / LOCATION PLAN			**SOURCE CRS:**	ITM EPSG:2157	**DRAWN BY:**	DL	DATE: 10/11/2021
DRAWING NUMBER: M02127-06_FIG_FL100			**DRAWING SCALE:**	AS SHOWN @ A3	**CHECKED BY:**	PS	DATE: 10/11/2021
REV: 01	**NOTE:** 1ST ISSUE	**DATE:** 10/11/2021	**MAP SERIES:**	PAGE 01 OF 26	**APPROVED BY:**	DKS	DATE: 10/11/2021



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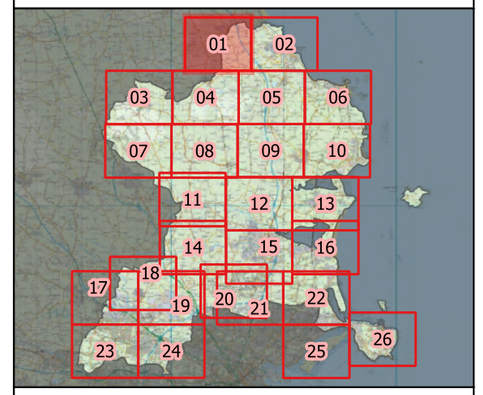

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP MRFS Flood Extent
- 0.1% AEP MRFS Flood Extent
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MAP:	MID RANGE FUTURE SCENARIO FLOOD EXTENT	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021
DRAWING NUMBER:	M02127-06_FIG_FL201	
MAP SERIES:		PAGE 01 OF 26
DRAWING SCALE:		1:20000 @ A3

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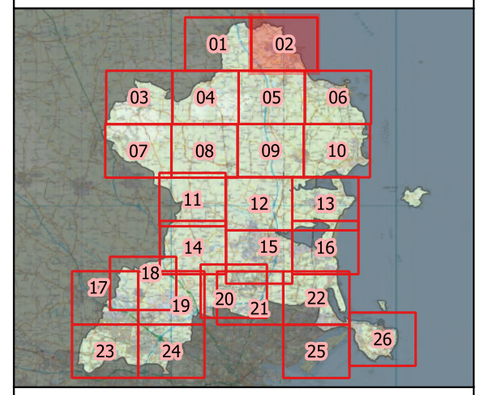

LEGEND

- Fingal County Administrative Boundary
- Watercourses
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- 0.1% AEP MRFS Flood Extent
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REV:	NOTE:	DATE:
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MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT		
FLOOD PROBABILITY: FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%		
SOURCE CRS:		ITM EPSG:2157
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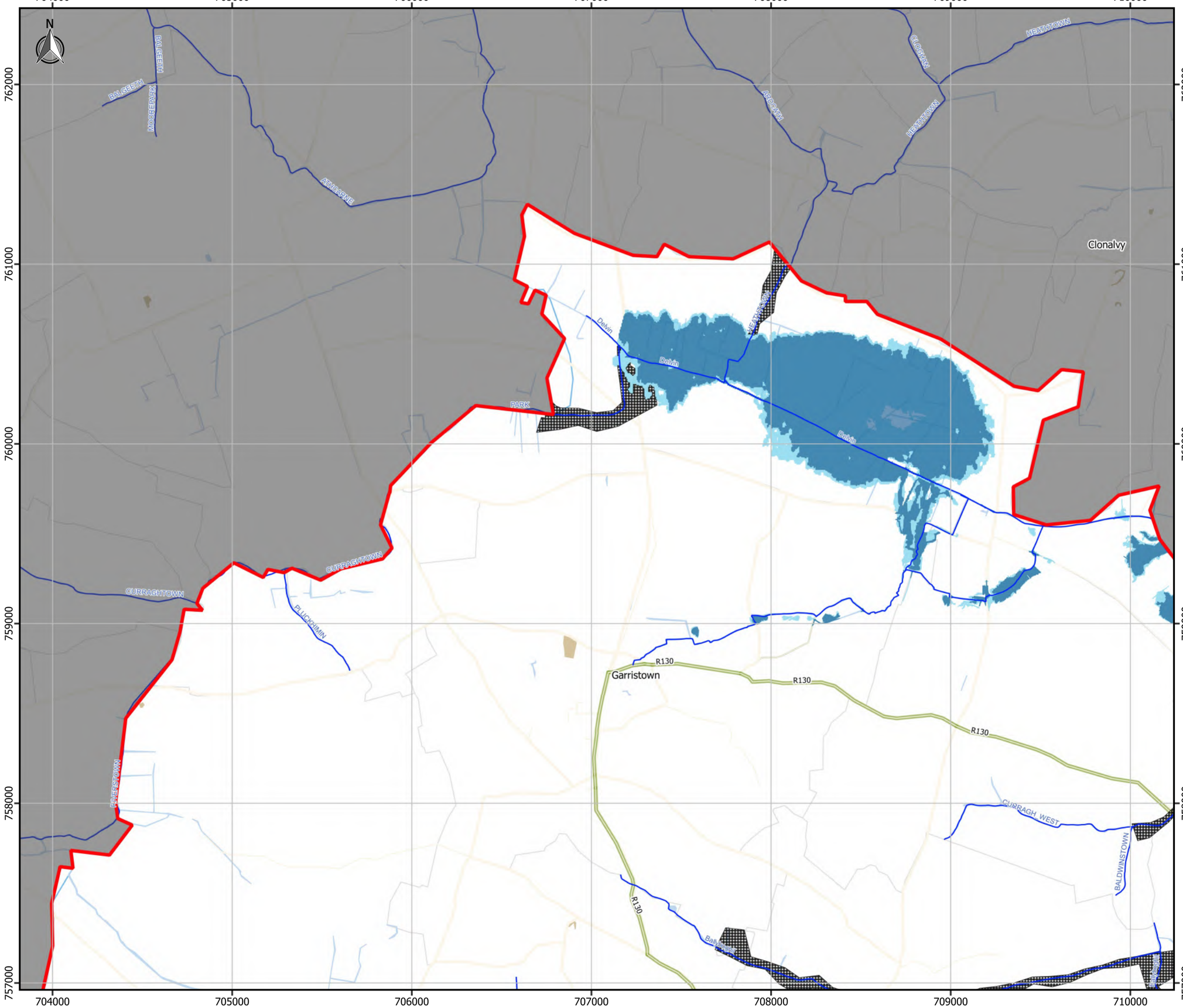
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021
DRAWING NUMBER: M02127-06_FIG_FL202		
MAP SERIES:		PAGE 02 OF 26
DRAWING SCALE:		1:20000 @ A3



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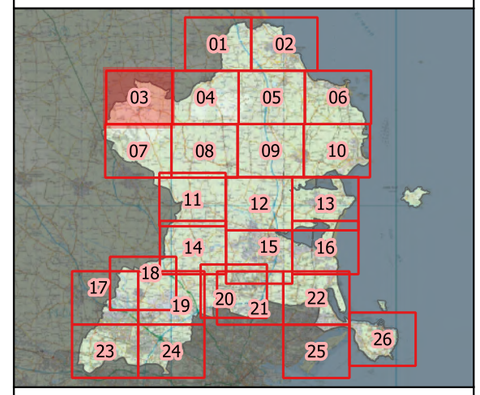

LEGEND

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- Watercourses
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- 0.1% AEP MRFS Flood Extent
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MAP:	MID RANGE FUTURE SCENARIO FLOOD EXTENT	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
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CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021
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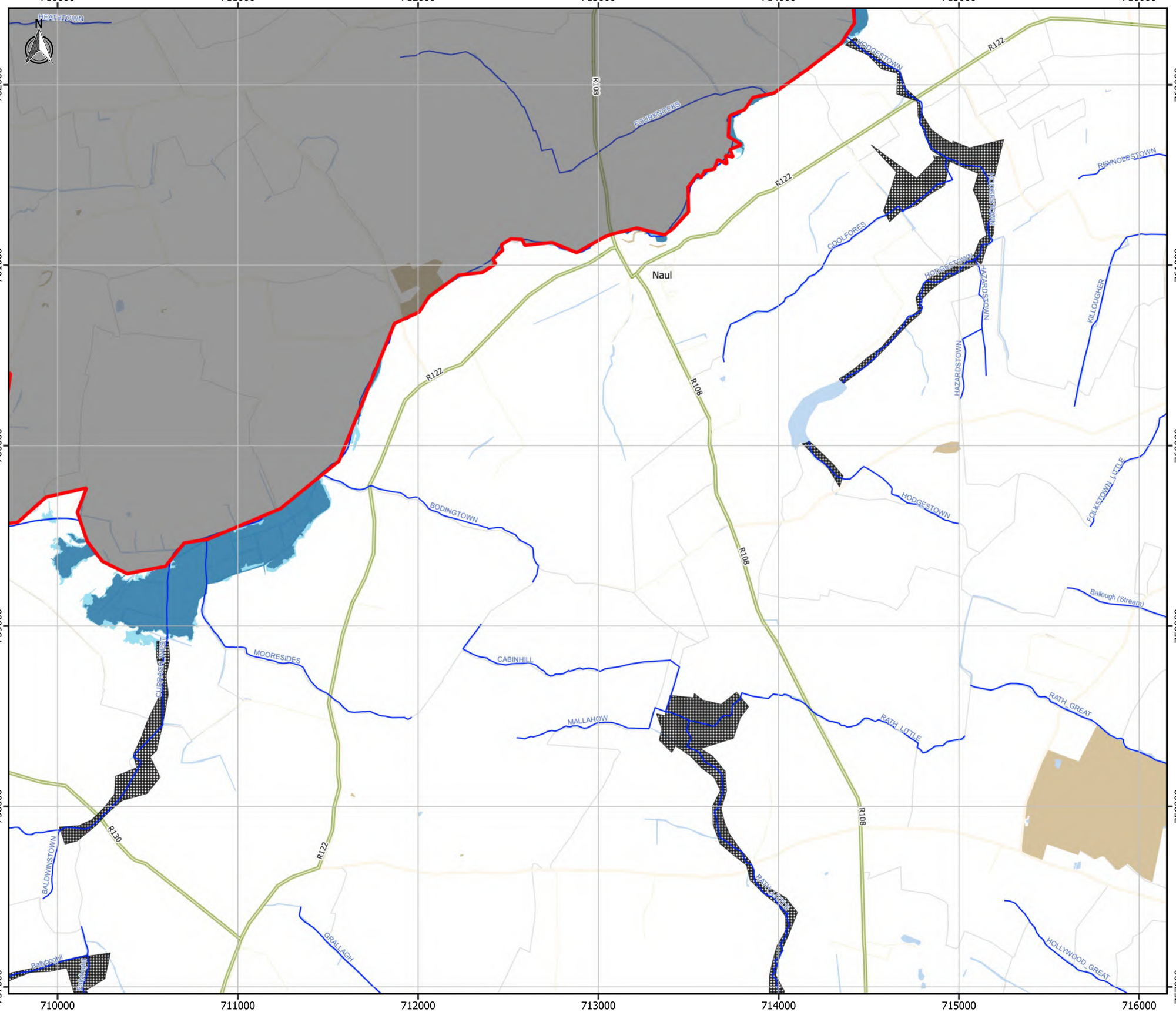
MAP SERIES:		PAGE 03 OF 26
DRAWING SCALE:		1:20000 @ A3



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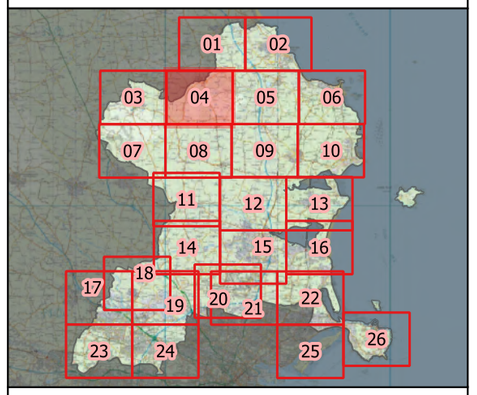

LEGEND

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MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT

FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

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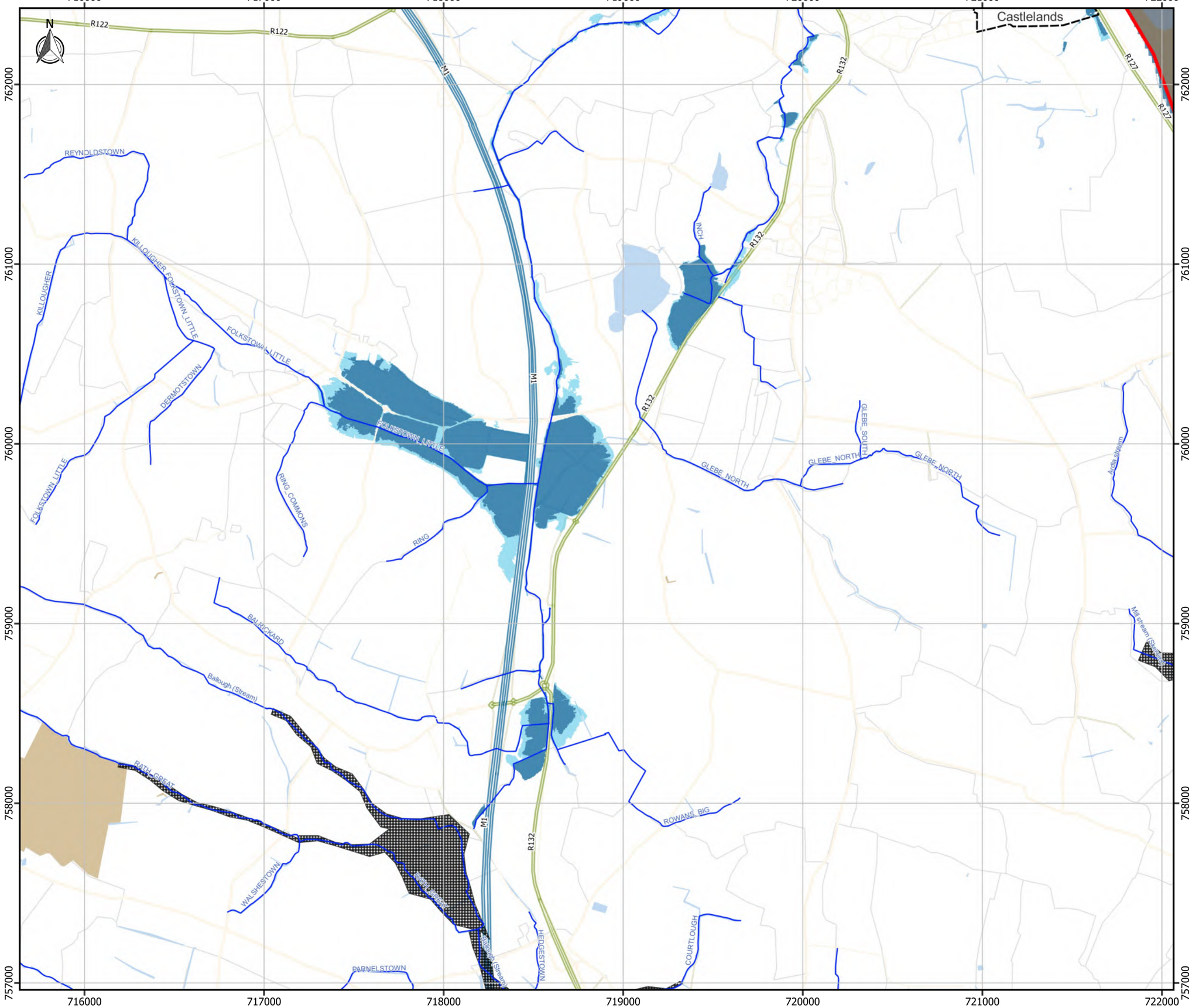
MAP SERIES:	PAGE 04 OF 26
DRAWING SCALE:	1:20000 @ A3



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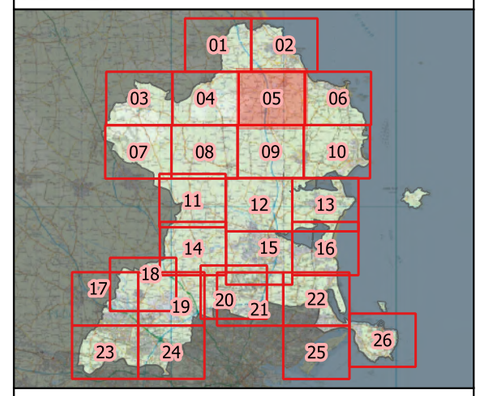

LEGEND

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REV: 02	**NOTE:** DRAFT ISSUE	**DATE:** 01/12/2021

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MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT		
FLOOD PROBABILITY: FLUVIAL: 1% / 0.1%		COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021
DRAWING NUMBER: M02127-06_FIG_FL205		
MAP SERIES:		PAGE 05 OF 26
DRAWING SCALE:		1:20000 @ A3

722000 723000 724000 725000 726000 727000

762000 761000 760000 759000 758000 757000

Castlelands

N

Skerries

MARGARETSTOWN

BALCUNNIN

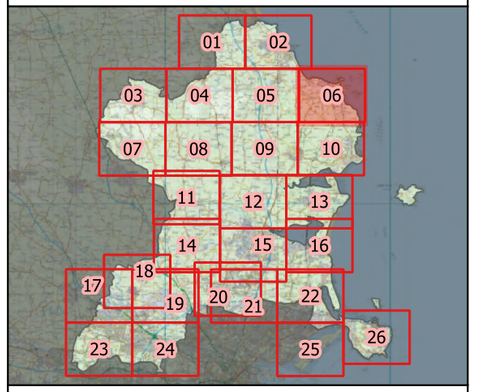
R127 R128

Ardla stream

Mill stream (Skerries)

0 0.5 1 km

KEY PLAN



LEGEND

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- 0.1% AEP MRFS Flood Extent
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REV:	NOTE:	DATE:
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MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT

FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
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CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

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MAP SERIES:	PAGE 06 OF 26
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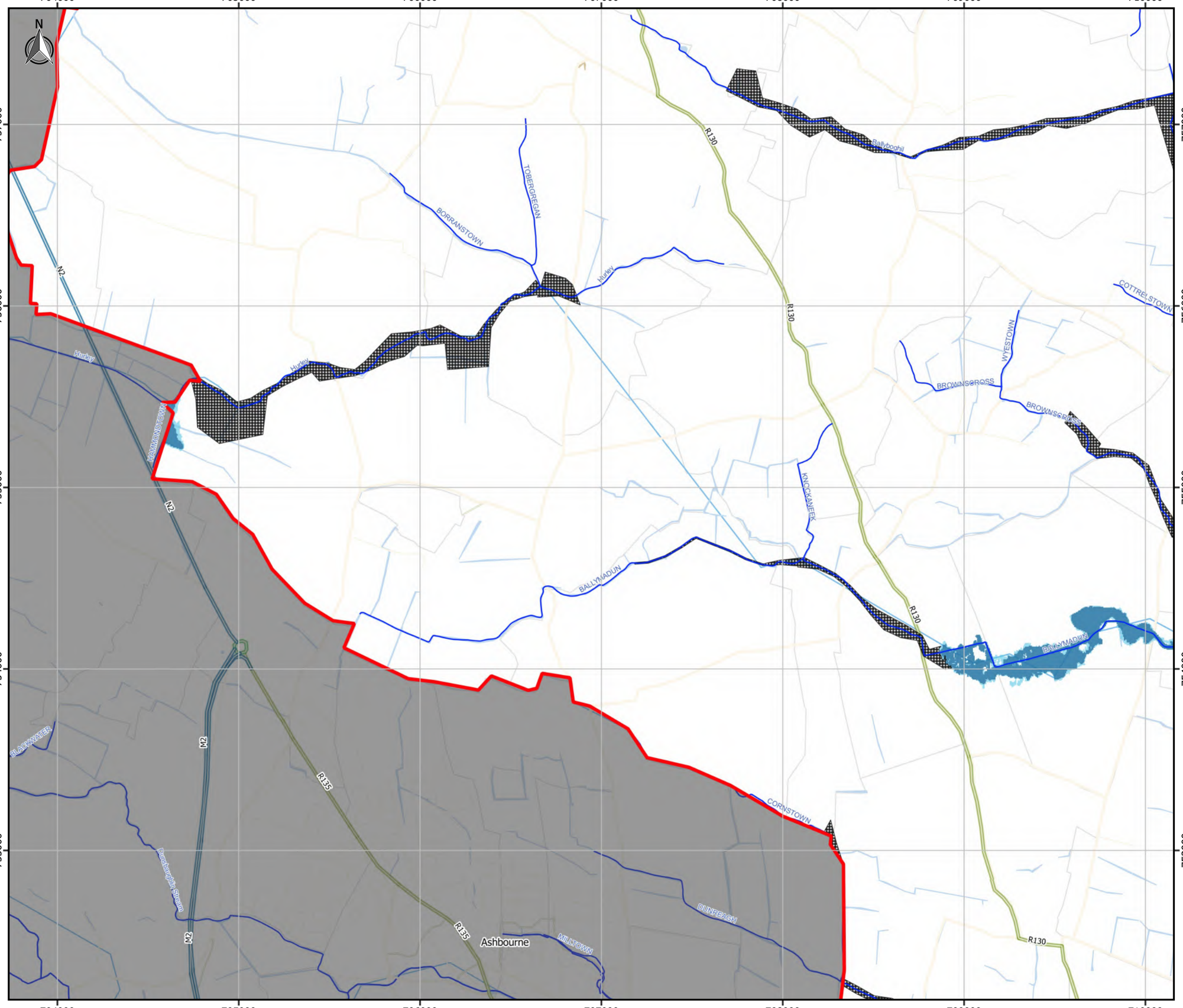

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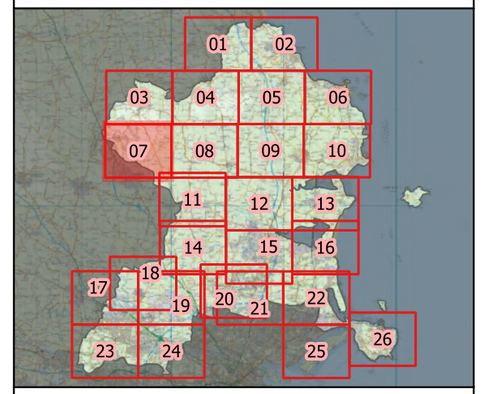

LEGEND

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- Watercourses
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- 0.1% AEP MRFS Flood Extent
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REV:	NOTE:	DATE:
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MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT

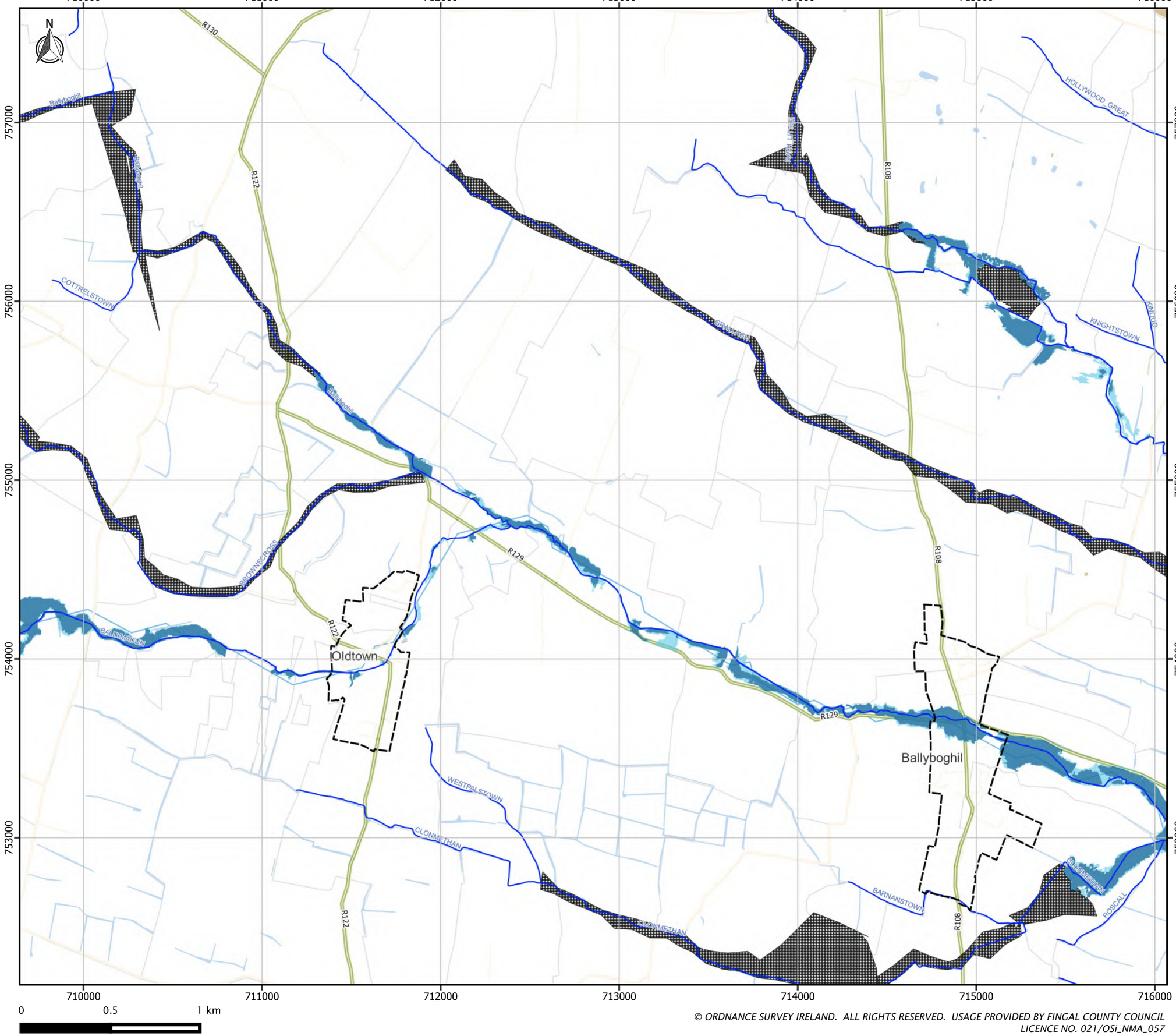
FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL207

MAP SERIES:	PAGE 07 OF 26
DRAWING SCALE:	1:20000 @ A3



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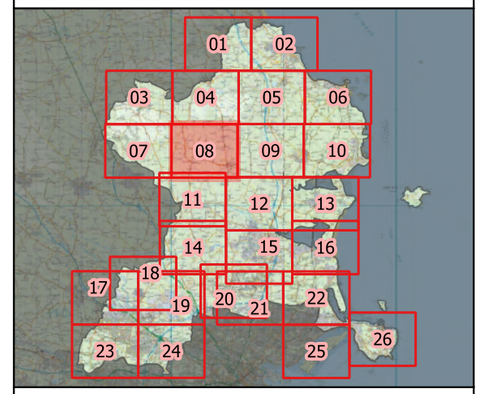

LEGEND

- Fingal County Administrative Boundary
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- 0.1% AEP MRFS Flood Extent
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REV:	NOTE:	DATE:
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MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT

FLOOD PROBABILITY:
FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
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APPROVED BY:	DKS	DATE: 01/12/2021
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MAP SERIES:		PAGE 08 OF 26
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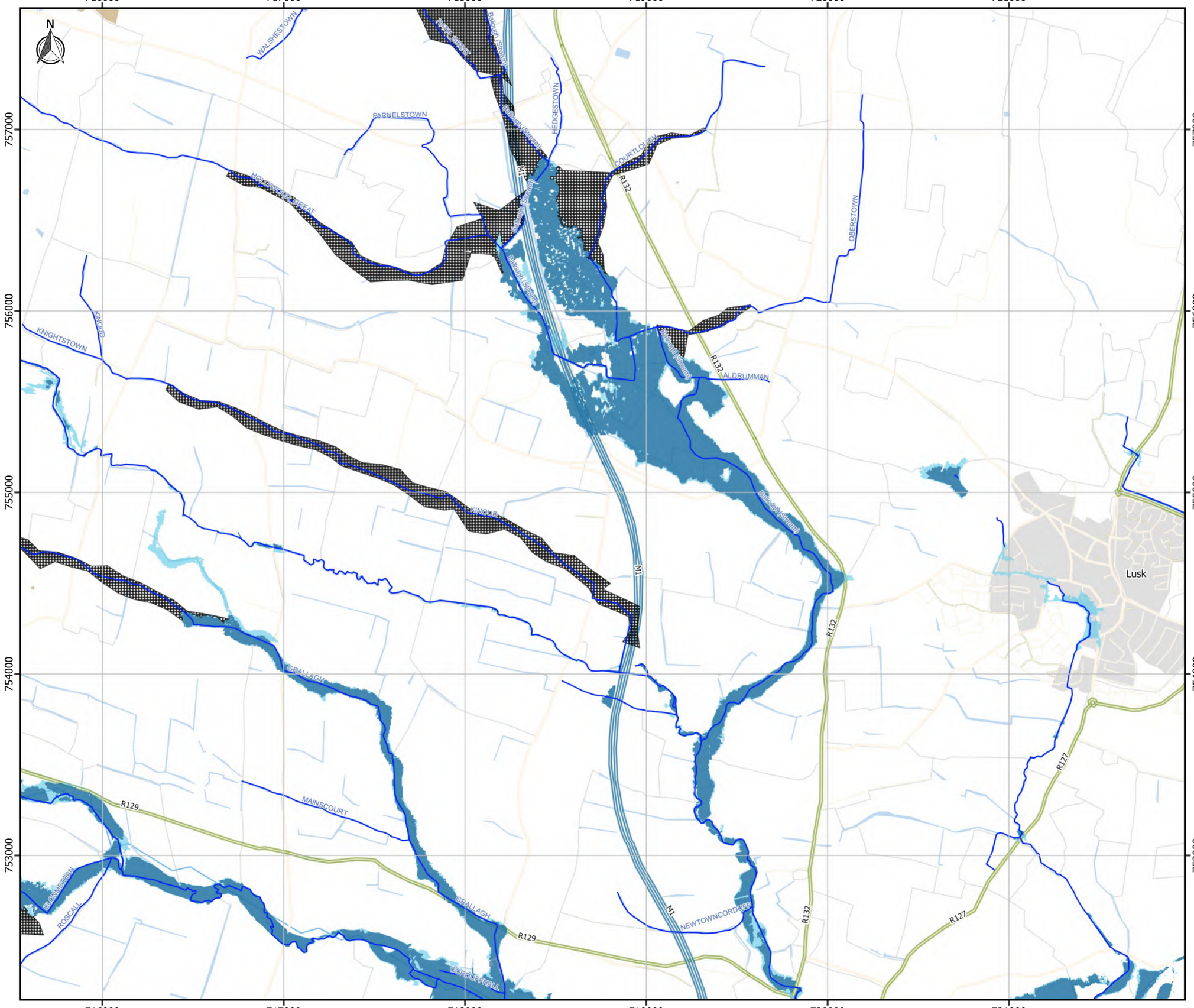

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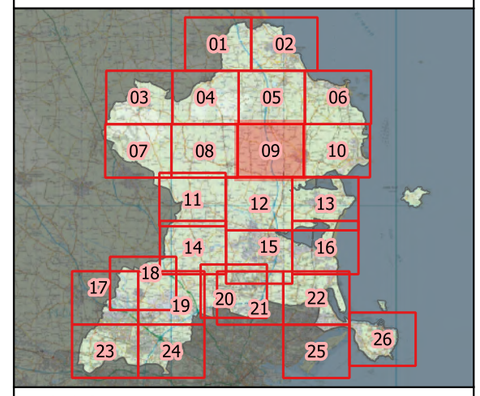

LEGEND

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MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT

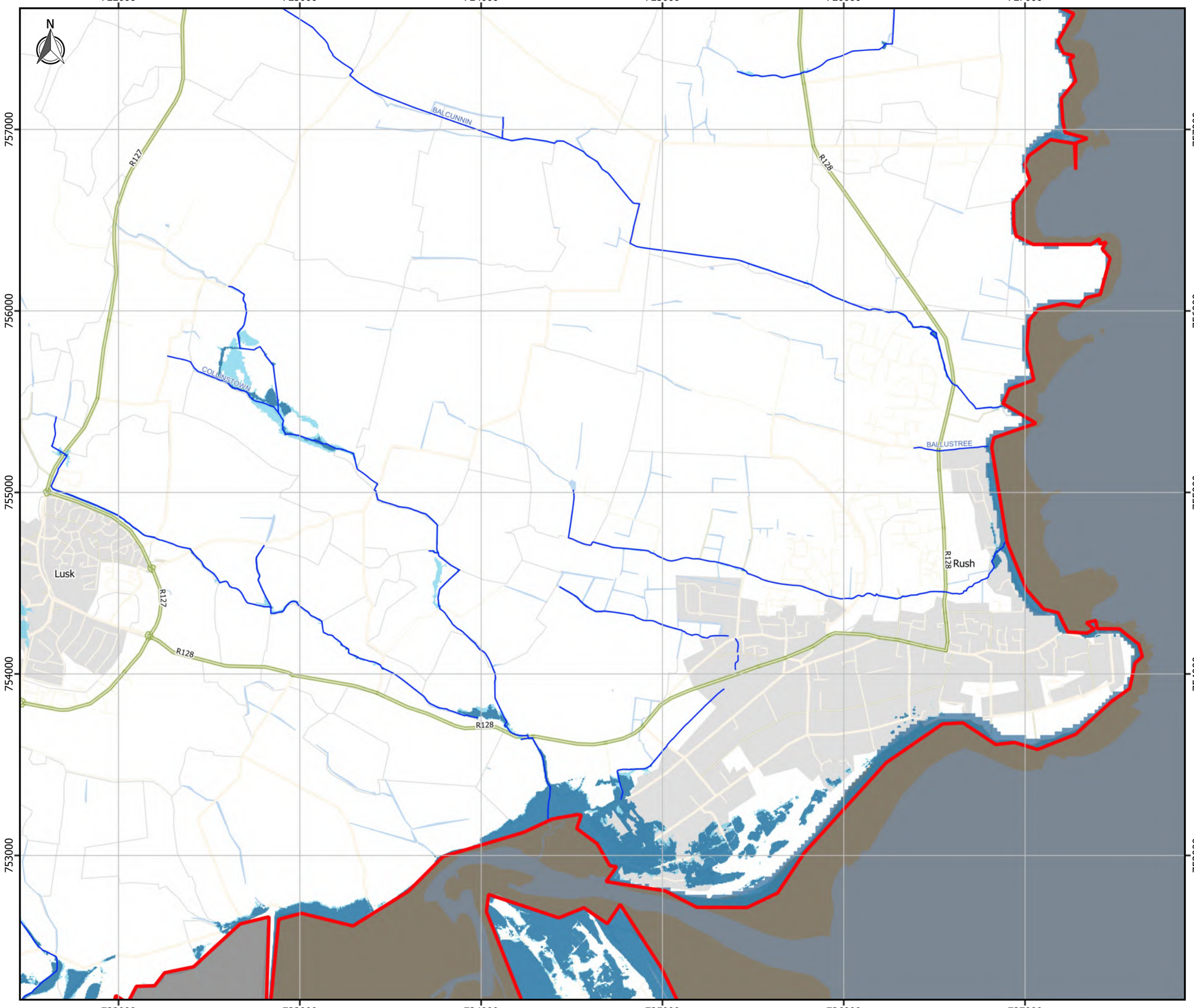
FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL209

MAP SERIES:	PAGE 09 OF 26
DRAWING SCALE:	1:20000 @ A3



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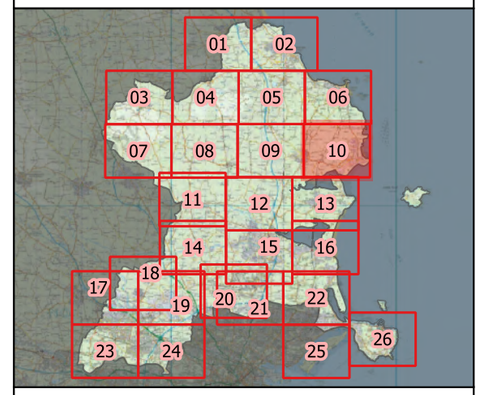

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP MRFS Flood Extent
- 0.1% AEP MRFS Flood Extent
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REV:	NOTE:	DATE:
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W: www.mccloyconsulting.ie

MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT

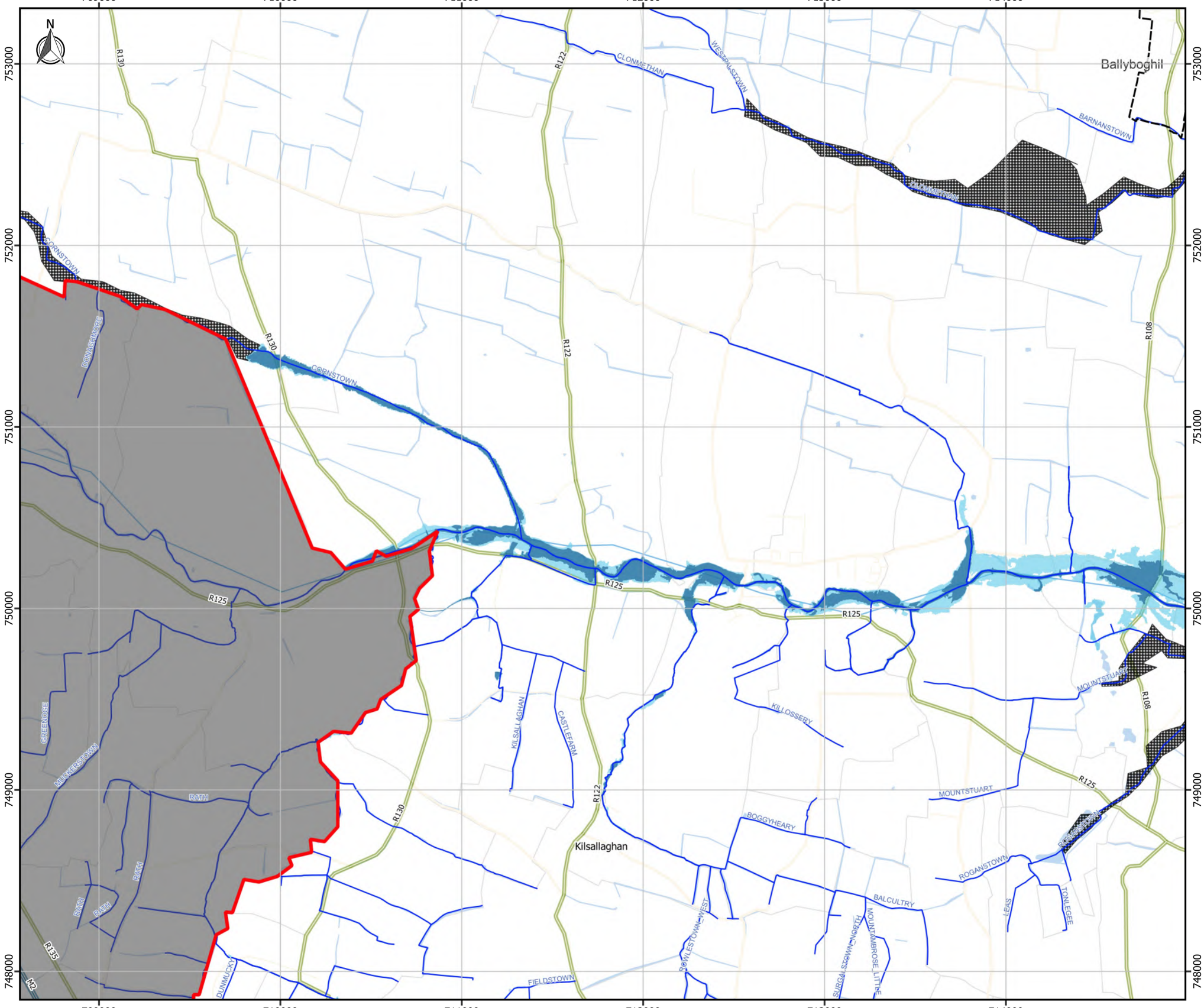
FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL210

MAP SERIES:	PAGE 10 OF 26
DRAWING SCALE:	1:20000 @ A3



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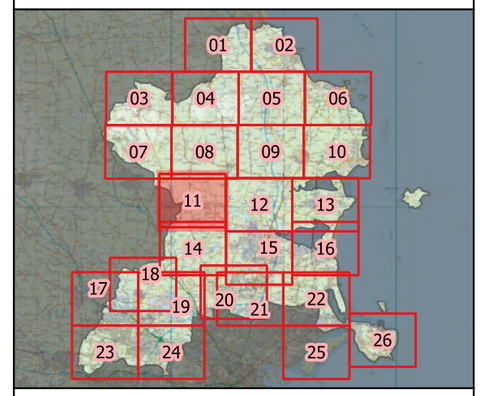

LEGEND

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- 1% / 0.5% AEP MRFS Flood Extent
- 0.1% AEP MRFS Flood Extent
- No Climate Change Data Available; Present Day Flood Data Only.CC Flood Risk Subject to Site Specific Assessment
- Area for Further Consideration

REV:	NOTE:	DATE:
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W: www.mccloyconsulting.ie

MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT

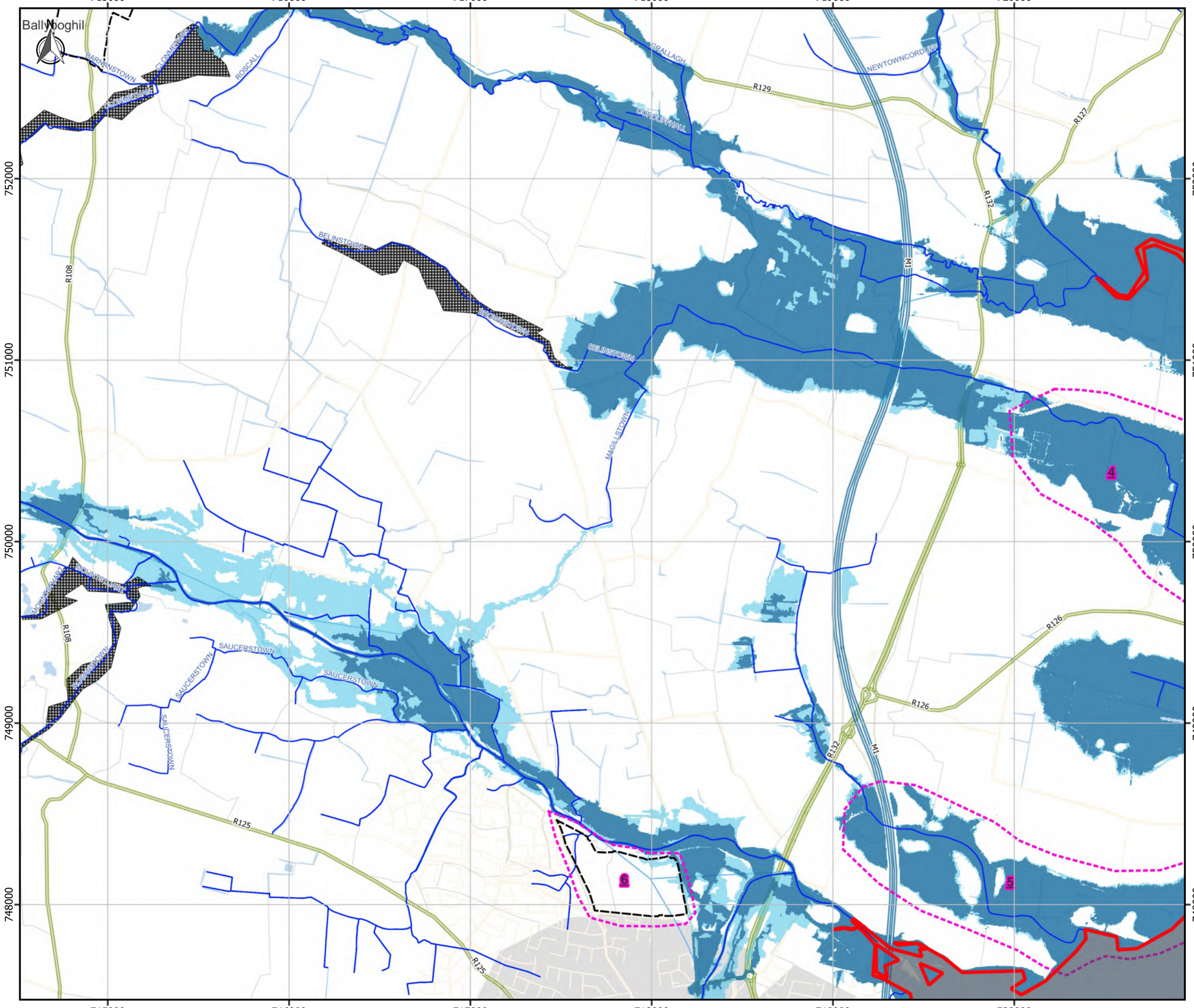
FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

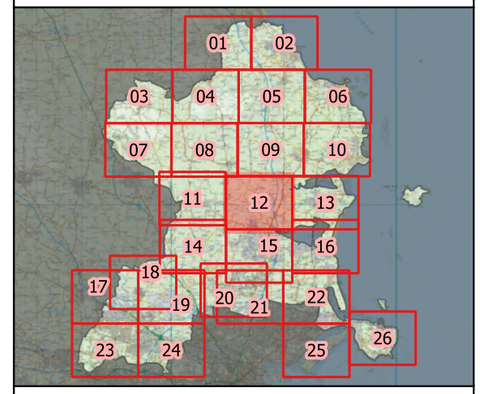
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL211

MAP SERIES:	PAGE 11 OF 26
DRAWING SCALE:	1:20000 @ A3



KEY PLAN



LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP MRFS Flood Extent
- 0.1% AEP MRFS Flood Extent
- No Climate Change Data Available; Present Day Flood Data Only.CC Flood Risk Subject to Site Specific Assessment
- Area for Further Consideration

REV:	NOTE:	DATE:
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W: www.mccloyconsulting.ie

MAP:	MID RANGE FUTURE SCENARIO FLOOD EXTENT	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021
DRAWING NUMBER:	M02127-06_FIG_FL212	
MAP SERIES:		PAGE 12 OF 26
DRAWING SCALE:		1:20000 @ A3

721000 722000 723000 724000 725000 726000

752000 751000 750000 749000 748000

N

R127

Rahillion

Turvey

Ballymastone

Donabate

Corballis East

Corballis Nature Park

R126

RAHILLION

BALLALEASE NORTH

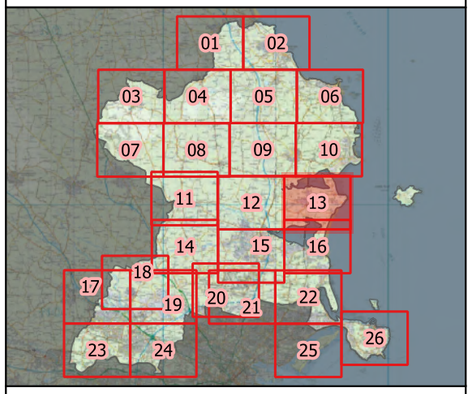
BALLALEASE

LAWESTOWN

1 2 3 4 5

0 0.5 1 km

KEY PLAN



LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP MRFS Flood Extent
- 0.1% AEP MRFS Flood Extent
- No Climate Change Data Available; Present Day Flood Data Only.CC Flood Risk Subject to Site Specific Assessment
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MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT

FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL213

MAP SERIES:	PAGE 13 OF 26
DRAWING SCALE:	1:20000 @ A3

709000 710000 711000 712000 713000 714000 715000

749000 748000 747000 746000 745000 744000

N

Kilsallaghan
River Meade
Dublin Airport
Cherryhound
St. Margaret's

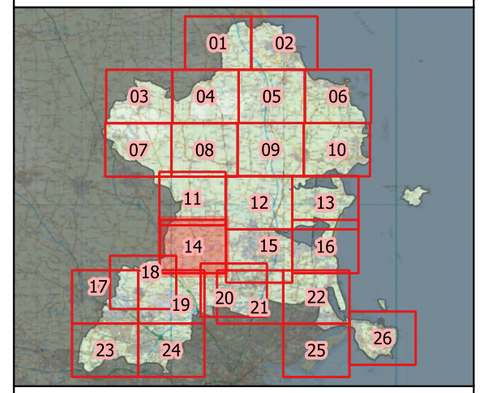
RATH
BOGGYHEARY
MOUNTSTUART
ROGANSTOWN
BALCULTRY
LEAS
TONLEGEE
ROWLESTOWN WEST
SURGALSTOWN NORTH
MOUNTAMBROSE LITTLE
DUNMICKY
FIELDSTOWN
KILCOSKAN
BALLYHACK
LAUDERSTOWN
COOLATRATH
COOLQUOY
GORRSTOWN
KILLEEK
WARD
WARD LOWER
COURT
COOLATRATH EAST
SHALLON
SKERHUBBLE
NEWPARK
BISHOPSWOOD
BROGHAN
DUNSOGHLY
SANDYHILL
KILREESK
TOBERBURR
ST.MARGARETS
MILLHEAD
DUNDRUM
COMMON

R135 R130 R122 R108 R125 R121

M2 N2

0 0.5 1 km

KEY PLAN



LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP MRFS Flood Extent
- 0.1% AEP MRFS Flood Extent
- No Climate Change Data Available; Present Day Flood Data Only.CC Flood Risk Subject to Site Specific Assessment
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REV:	NOTE:	DATE:
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MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT

FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021
DRAWING NUMBER:		M02127-06_FIG_FL214
MAP SERIES:		PAGE 14 OF 26
DRAWING SCALE:		1:20000 @ A3

715000 716000 717000 718000 719000 720000

748000 747000 746000 745000 744000 743000

N

R108 R125 R132 M1 R106

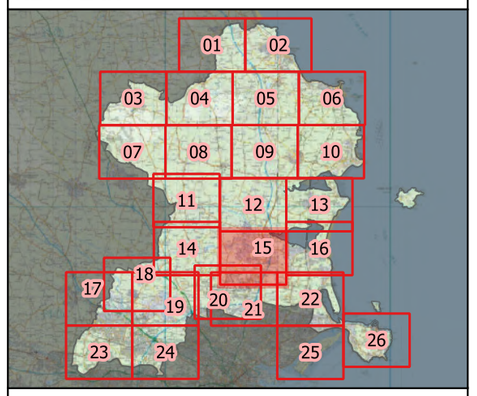
HILLTOWN SEAPOINT GREENFIELDS KILLEEK COMMON COMMONS EAST MARSHALLSTOWN

Swords Swords Dublin Airport

6 5 8

0 0.5 1 km

KEY PLAN



LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP MRFS Flood Extent
- 0.1% AEP MRFS Flood Extent
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REV:	NOTE:	DATE:
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MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT

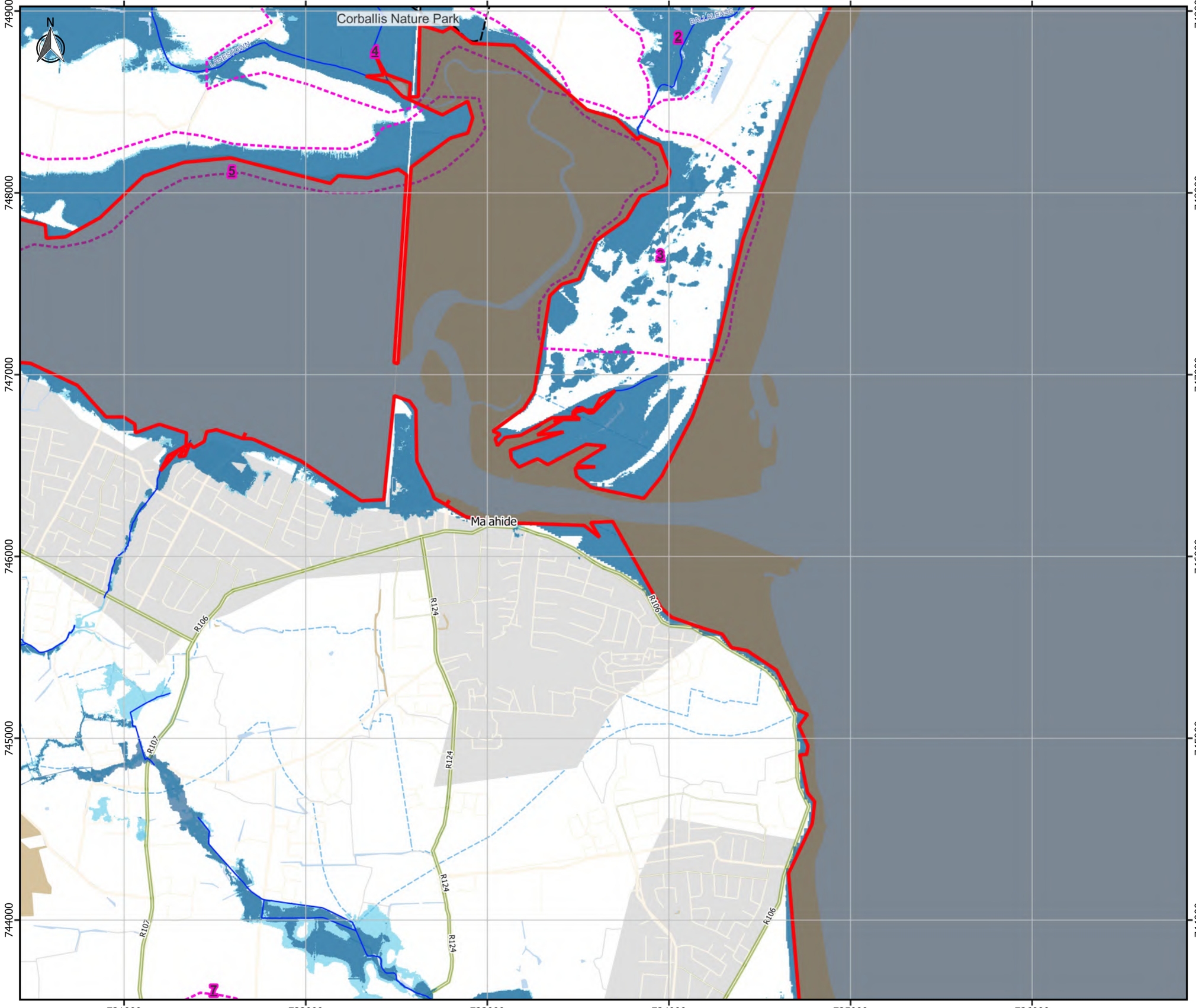
FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL215

MAP SERIES:	PAGE 15 OF 26
DRAWING SCALE:	1:20000 @ A3



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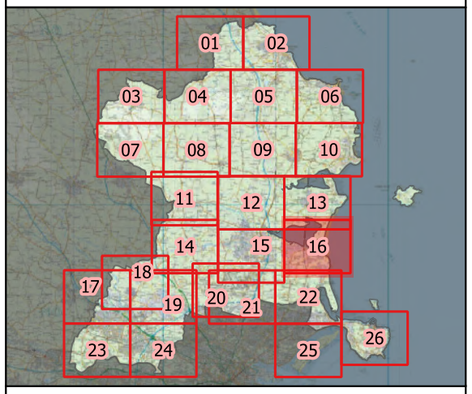

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP MRFS Flood Extent
- 0.1% AEP MRFS Flood Extent
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REV:	NOTE:	DATE:
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MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT

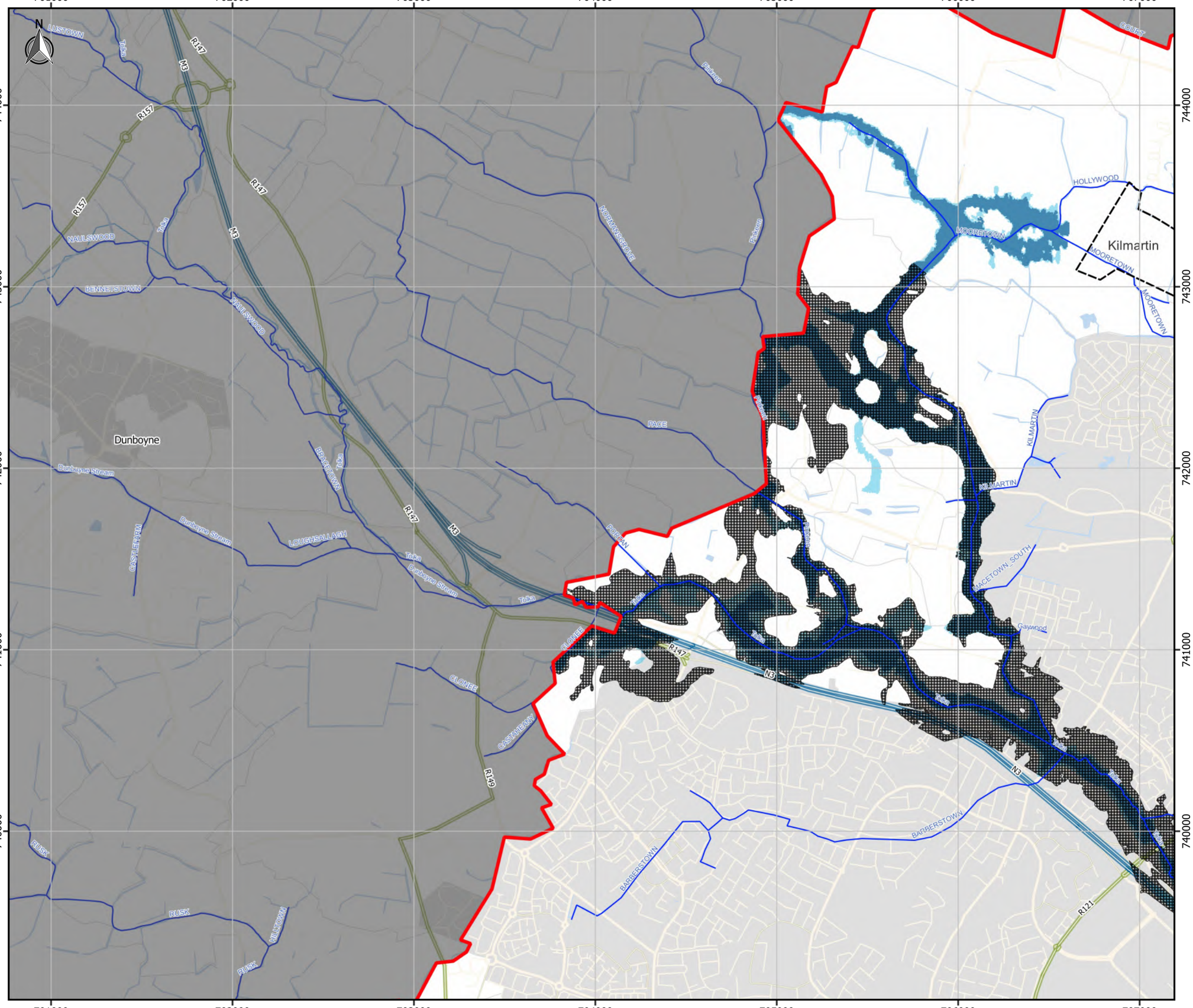
FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL216

MAP SERIES:	PAGE 16 OF 26
DRAWING SCALE:	1:20000 @ A3



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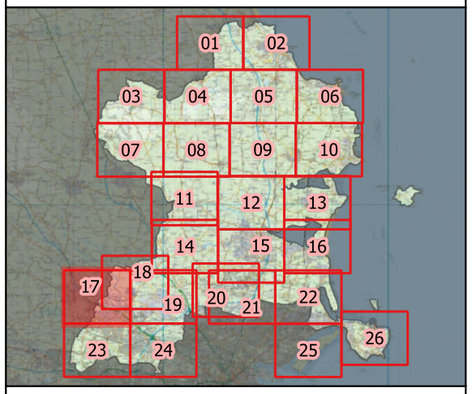

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
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- 0.1% AEP MRFS Flood Extent
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REV:	NOTE:	DATE:
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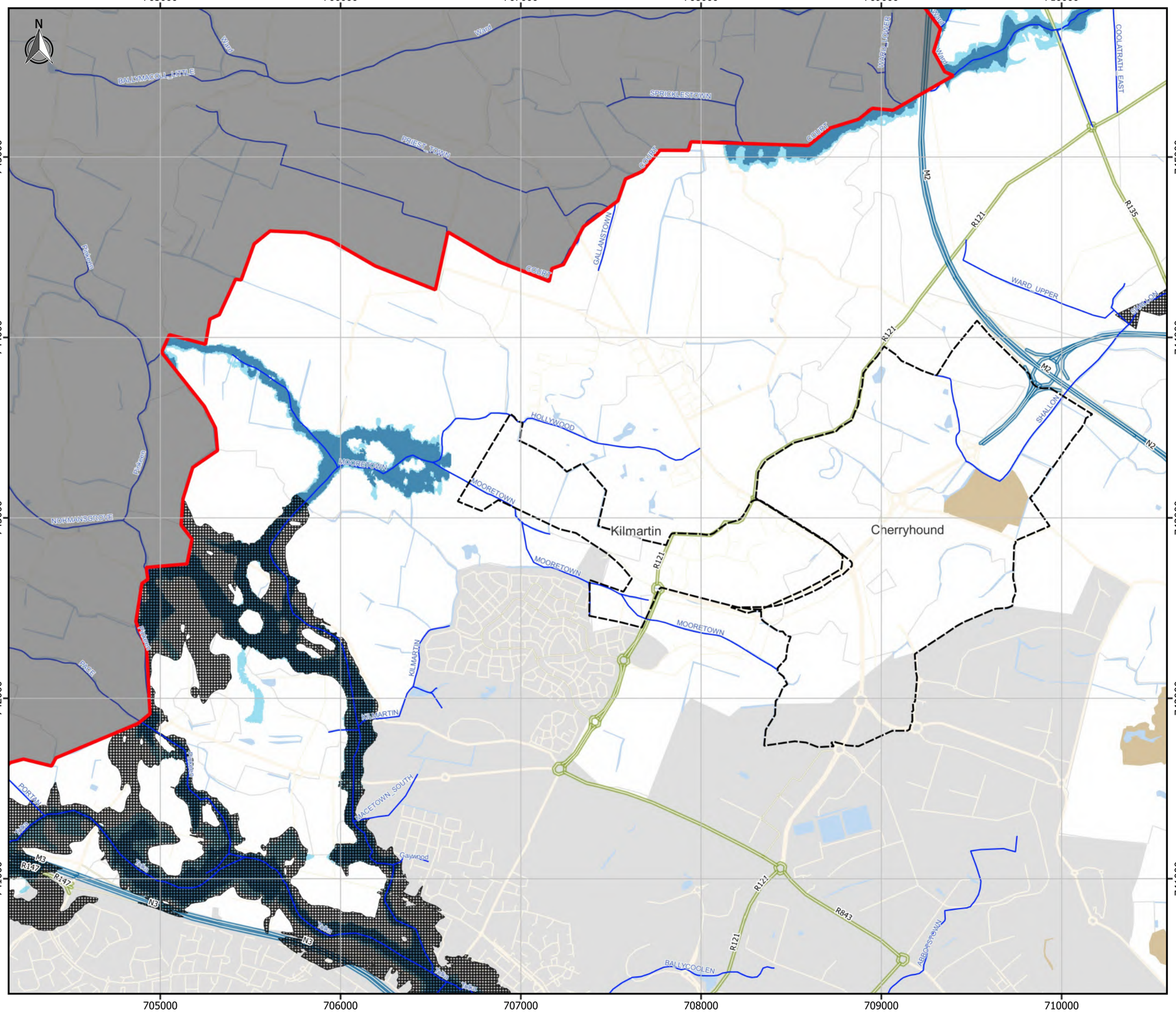
MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT

FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021
DRAWING NUMBER:		M02127-06_FIG_FL217
MAP SERIES:		PAGE 17 OF 26
DRAWING SCALE:		1:20000 @ A3



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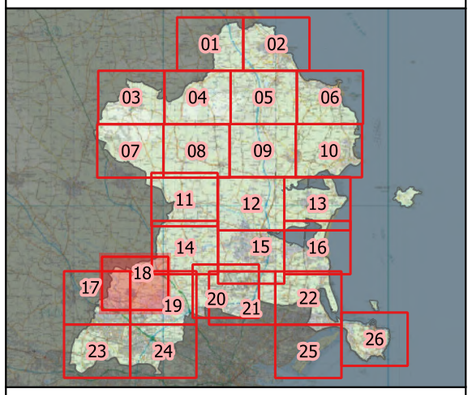

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP MRFS Flood Extent
- 0.1% AEP MRFS Flood Extent
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REV:	NOTE:	DATE:
02	DRAFT ISSUE	01/12/2021

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MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT

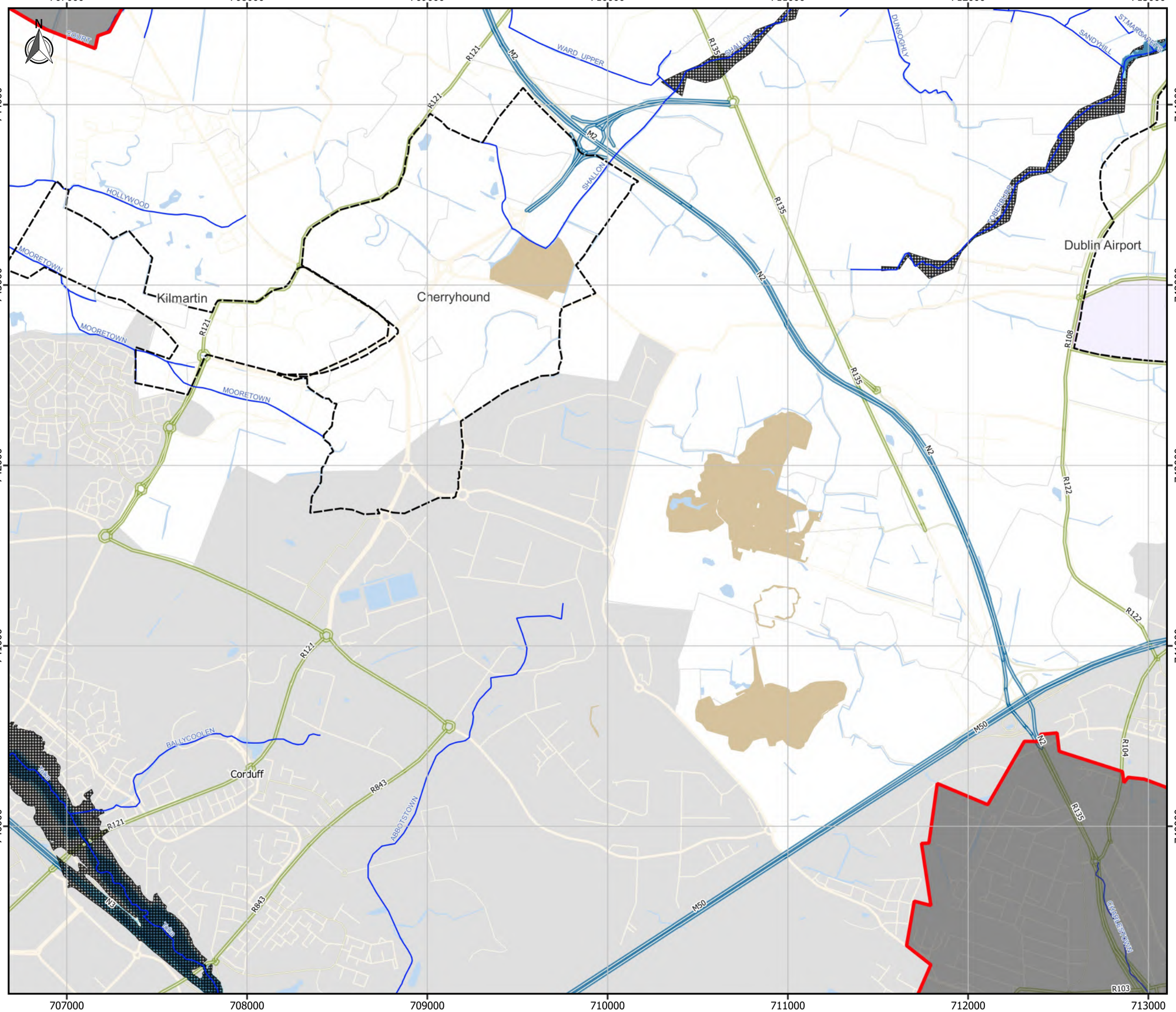
FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL218

MAP SERIES:	PAGE 18 OF 26
DRAWING SCALE:	1:20000 @ A3



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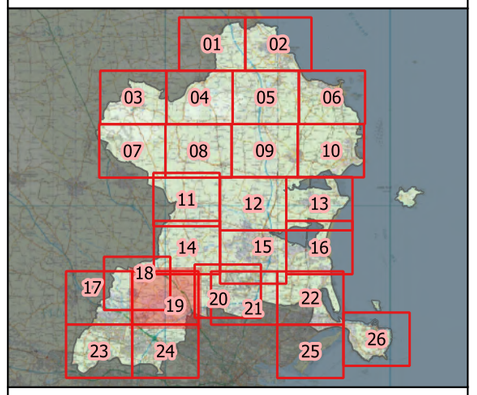

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP MRFS Flood Extent
- 0.1% AEP MRFS Flood Extent
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REV:	NOTE:	DATE:
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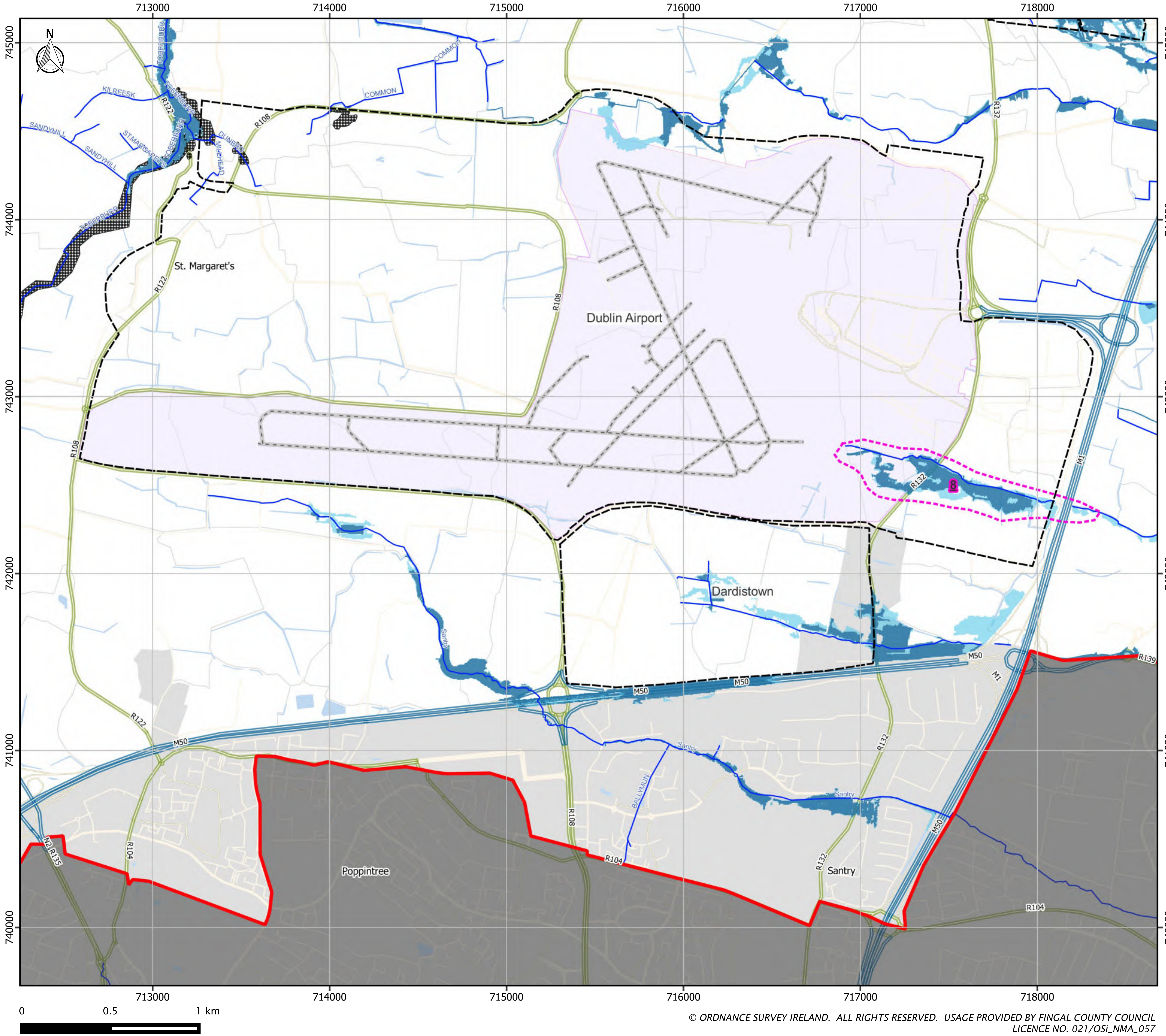
MAP:	MID RANGE FUTURE SCENARIO FLOOD EXTENT	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021
DRAWING NUMBER:	M02127-06_FIG_FL219	
MAP SERIES:		PAGE 19 OF 26
DRAWING SCALE:		1:20000 @ A3



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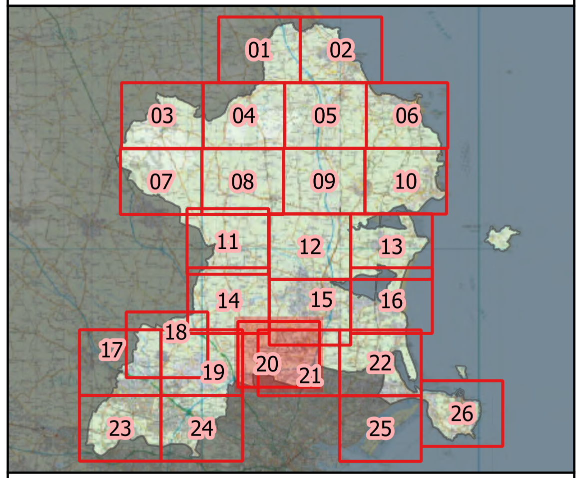
LICENCE NO. 021/OSi_NMA_057

KEY PLAN



LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP MRFS Flood Extent
- 0.1% AEP MRFS Flood Extent
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MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT

FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL220

MAP SERIES:	PAGE 20 OF 26
DRAWING SCALE:	1:20000 @ A3

714000 715000 716000 717000 718000 719000 720000

744000 743000 742000 741000 740000

N

Dublin Airport

Dardistown

Poppintree

Santry

Ballymun

Kilmore

Glasnevin North

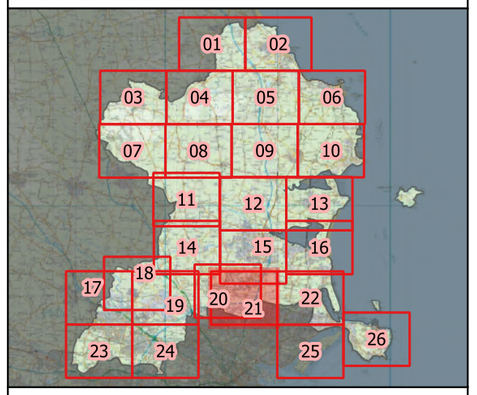
Coolock

R108 R132 R104 R139 R103 R107 M1 M50 BALLYMUN MARSHALLSTOWN Santry

8

0 0.5 1 km

KEY PLAN



LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP MRFS Flood Extent
- 0.1% AEP MRFS Flood Extent
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MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT

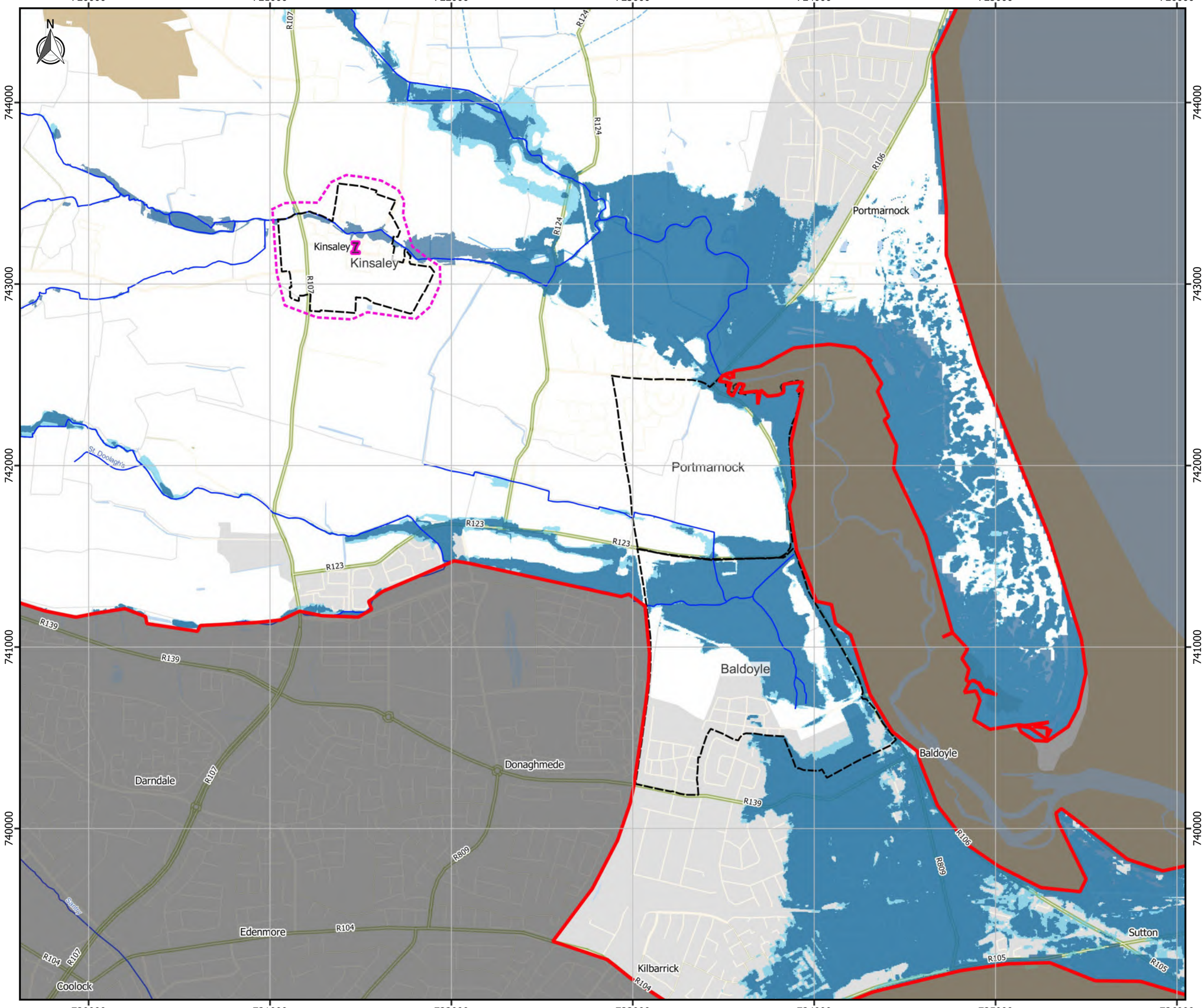
FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

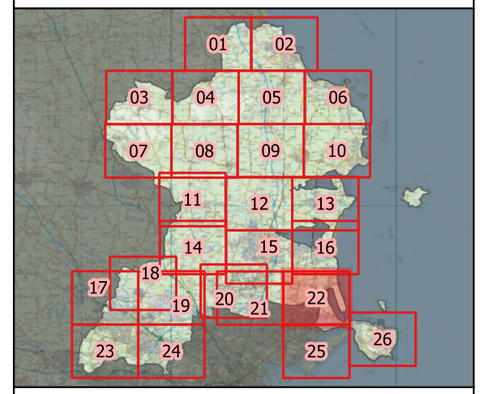
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL221

MAP SERIES:	PAGE 21 OF 26
DRAWING SCALE:	1:20000 @ A3



KEY PLAN



LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
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REV:	NOTE:	DATE:
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MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT

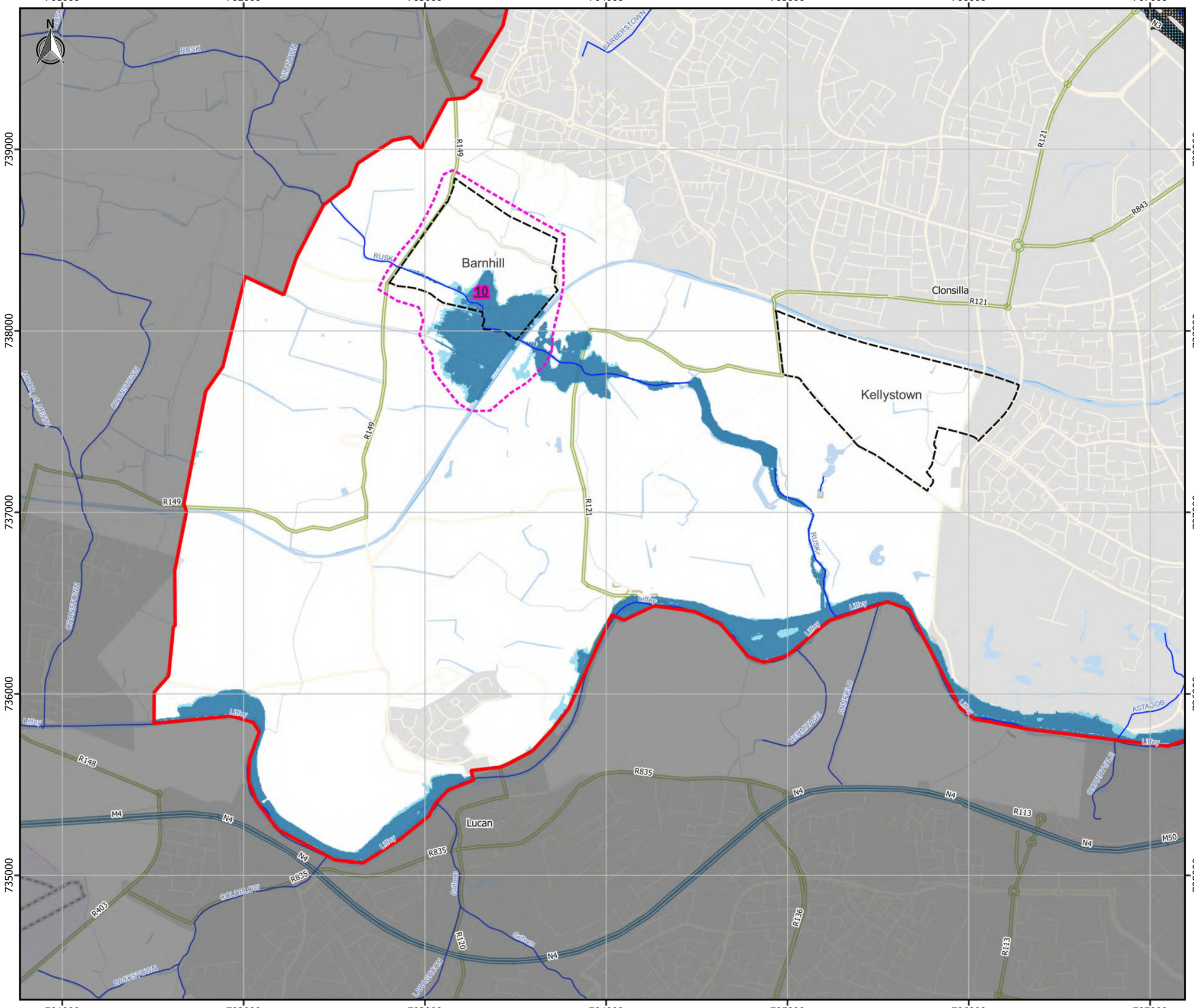
FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

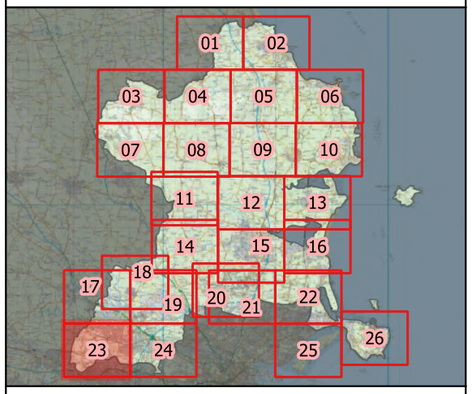
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL222

MAP SERIES:	PAGE 22 OF 26
DRAWING SCALE:	1:20000 @ A3



KEY PLAN



LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP MRFS Flood Extent
- 0.1% AEP MRFS Flood Extent
- No Climate Change Data Available; Present Day Flood Data Only.CC Flood Risk Subject to Site Specific Assessment
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REV:	NOTE:	DATE:
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MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT

FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL223

MAP SERIES:	PAGE 23 OF 26
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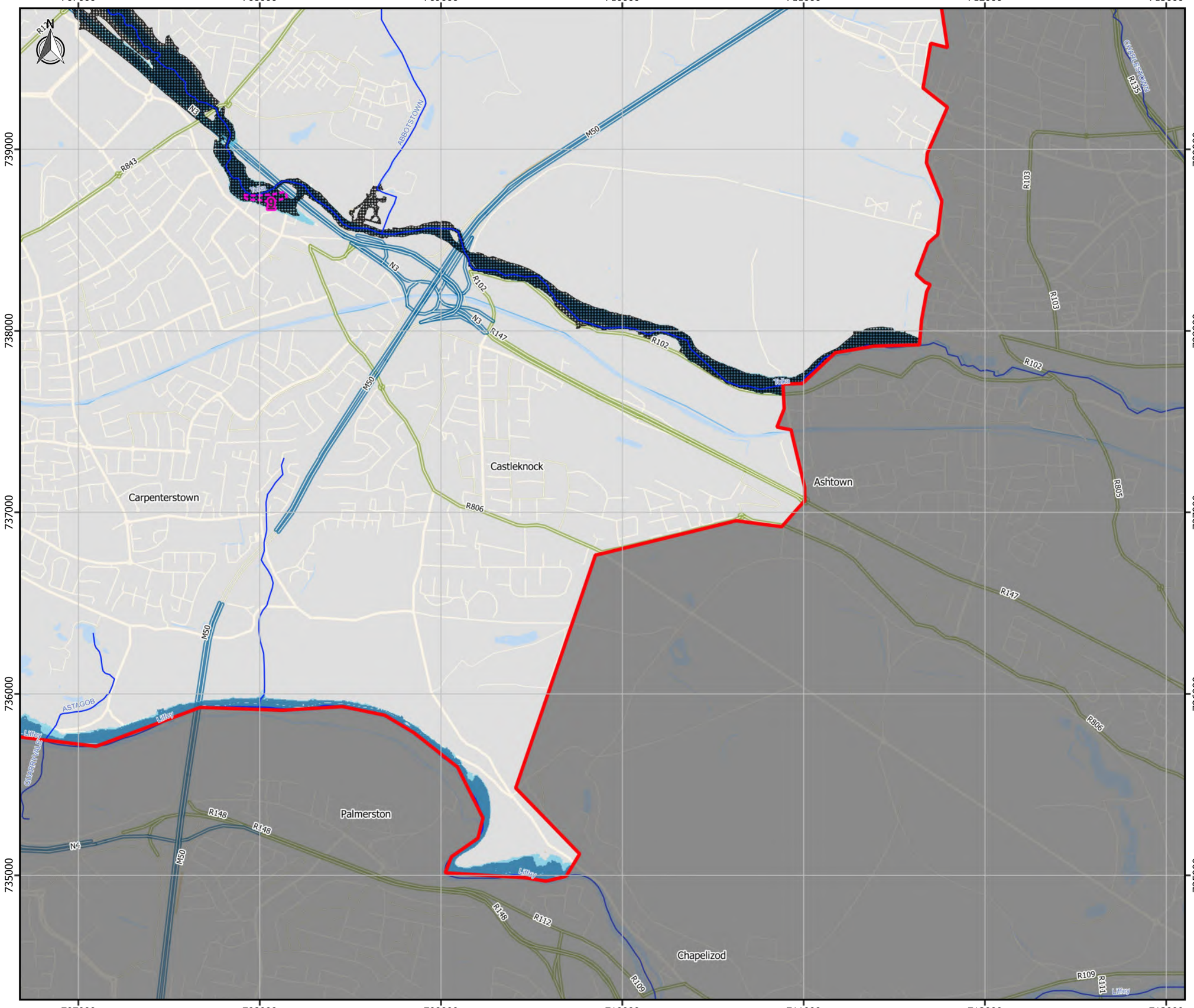

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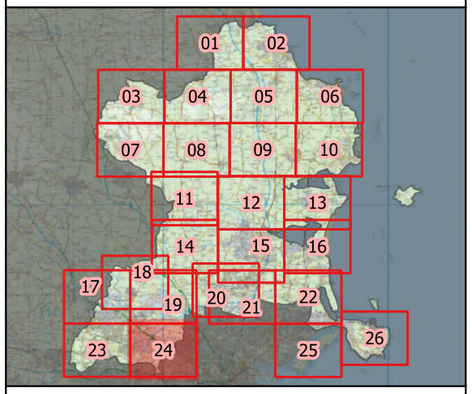

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP MRFS Flood Extent
- 0.1% AEP MRFS Flood Extent
- No Climate Change Data Available; Present Day Flood Data Only.CC Flood Risk Subject to Site Specific Assessment
- Area for Further Consideration

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MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT

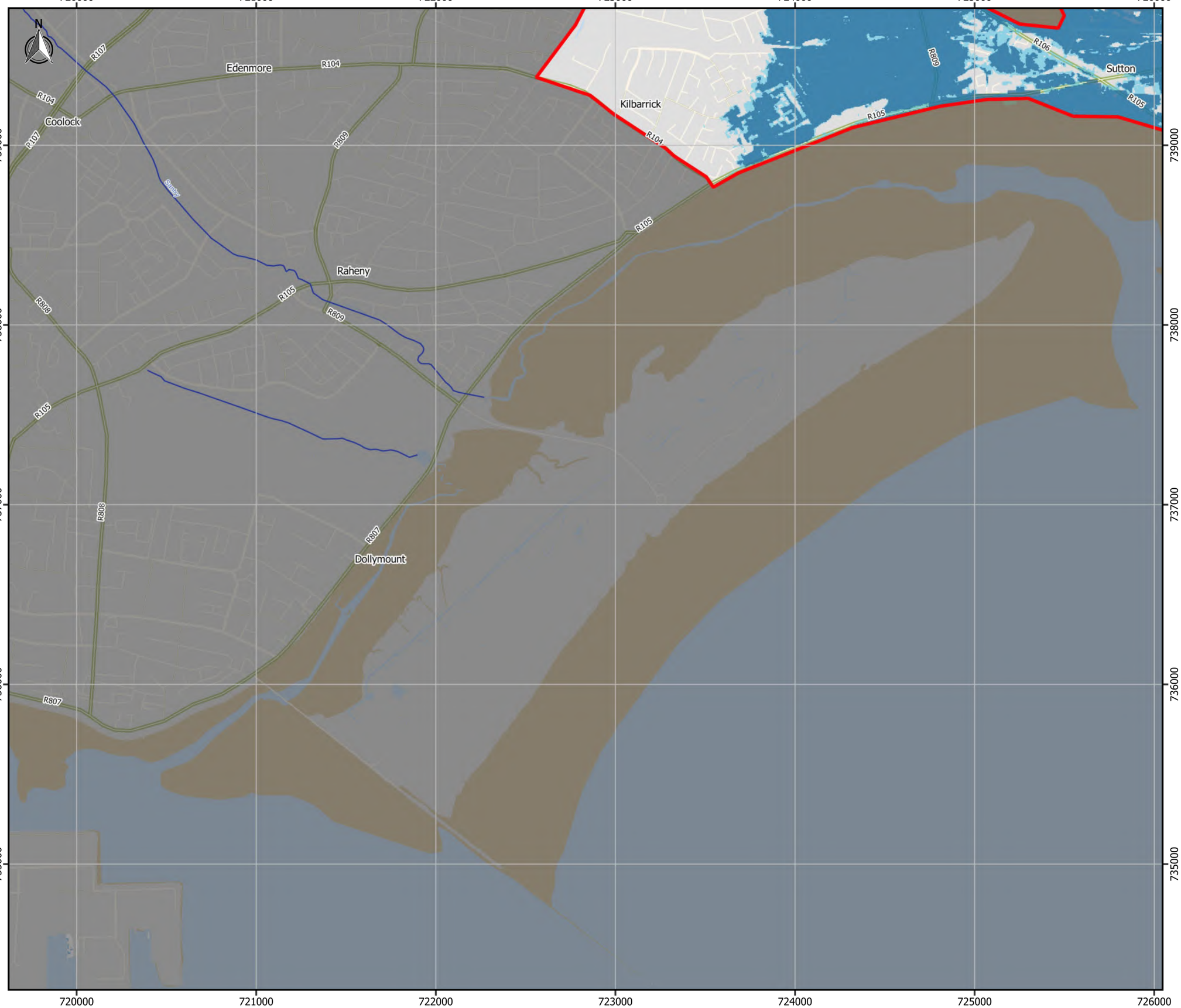
FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL224

MAP SERIES:	PAGE 24 OF 26
DRAWING SCALE:	1:20000 @ A3



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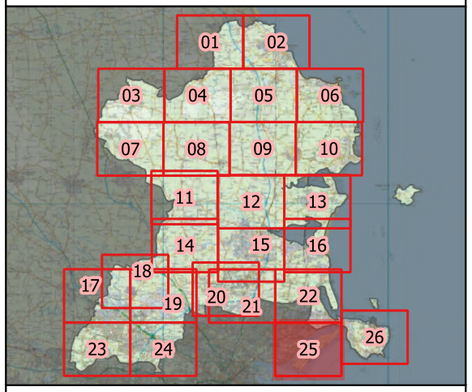

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
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MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT

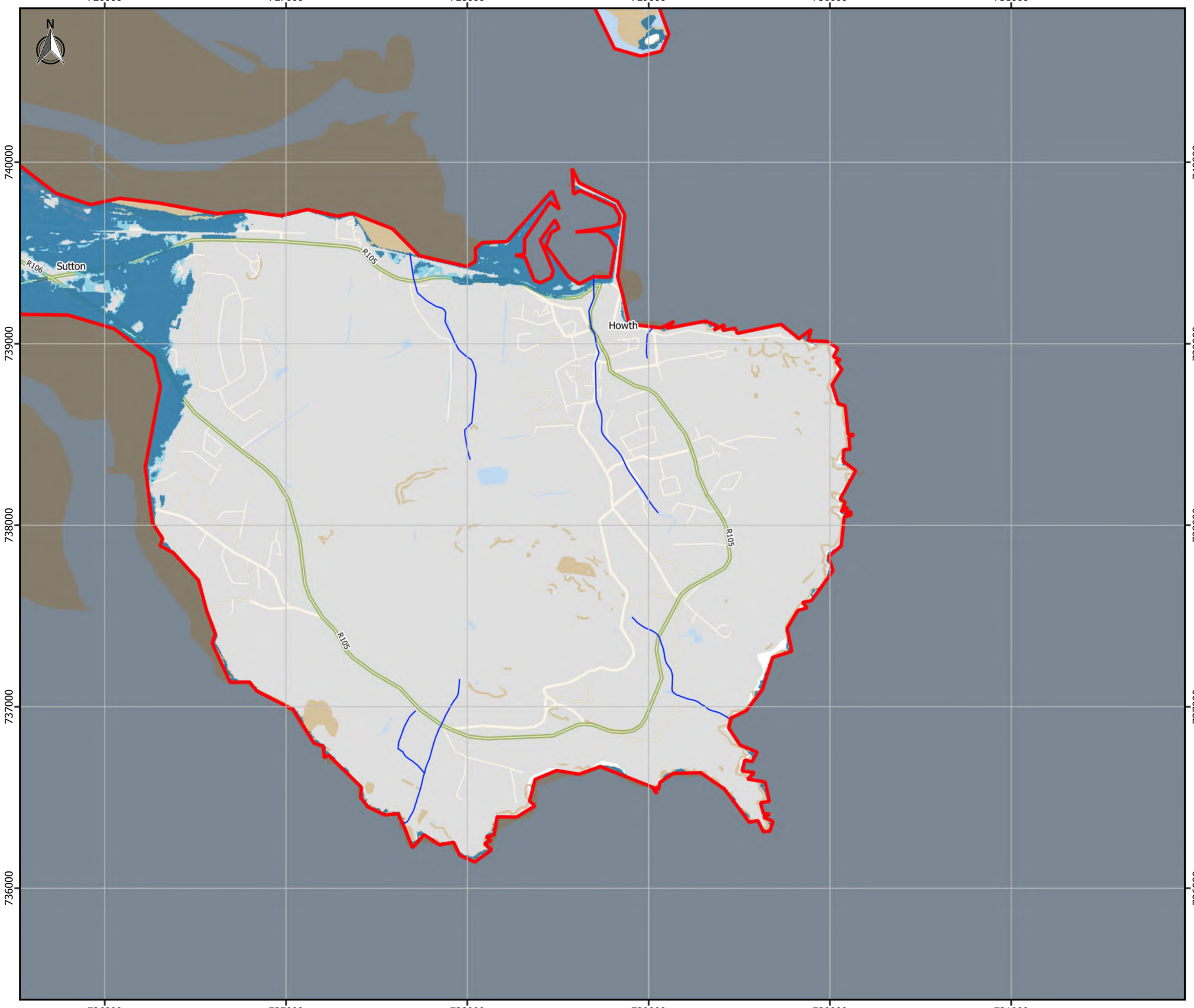
FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL225

MAP SERIES:	PAGE 25 OF 26
DRAWING SCALE:	1:20000 @ A3



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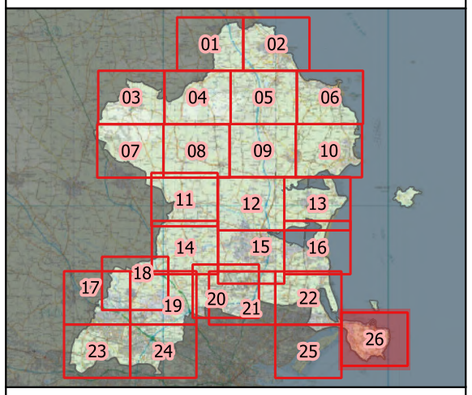

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
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MAP: MID RANGE FUTURE SCENARIO FLOOD EXTENT		
FLOOD PROBABILITY: FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%		
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021
DRAWING NUMBER: M02127-06_FIG_FL226		
MAP SERIES:		PAGE 26 OF 26
DRAWING SCALE:		1:20000 @ A3

Appendix C

High End Future Scenario -

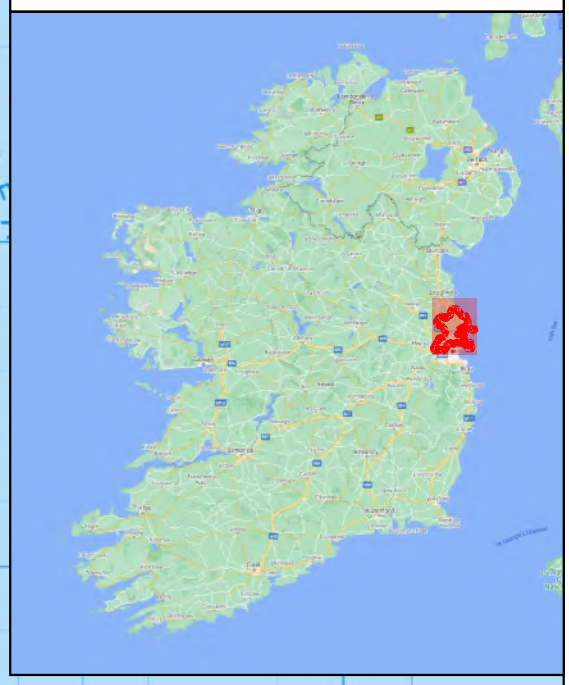
Climate Change Flood Extents Maps

LEGEND

Fingal County Administrative Boundary

Overview Map Page Number Reference

KEY PLAN



N

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

BALBRIGGAN Baile Brigín

SKERRIES Na Sceirí

Lambay Island

IRISH SEA Muir Éireann

DUBLIN

701000 711000 721000 731000

765000 755000 745000 735000

0 2.5 5 km

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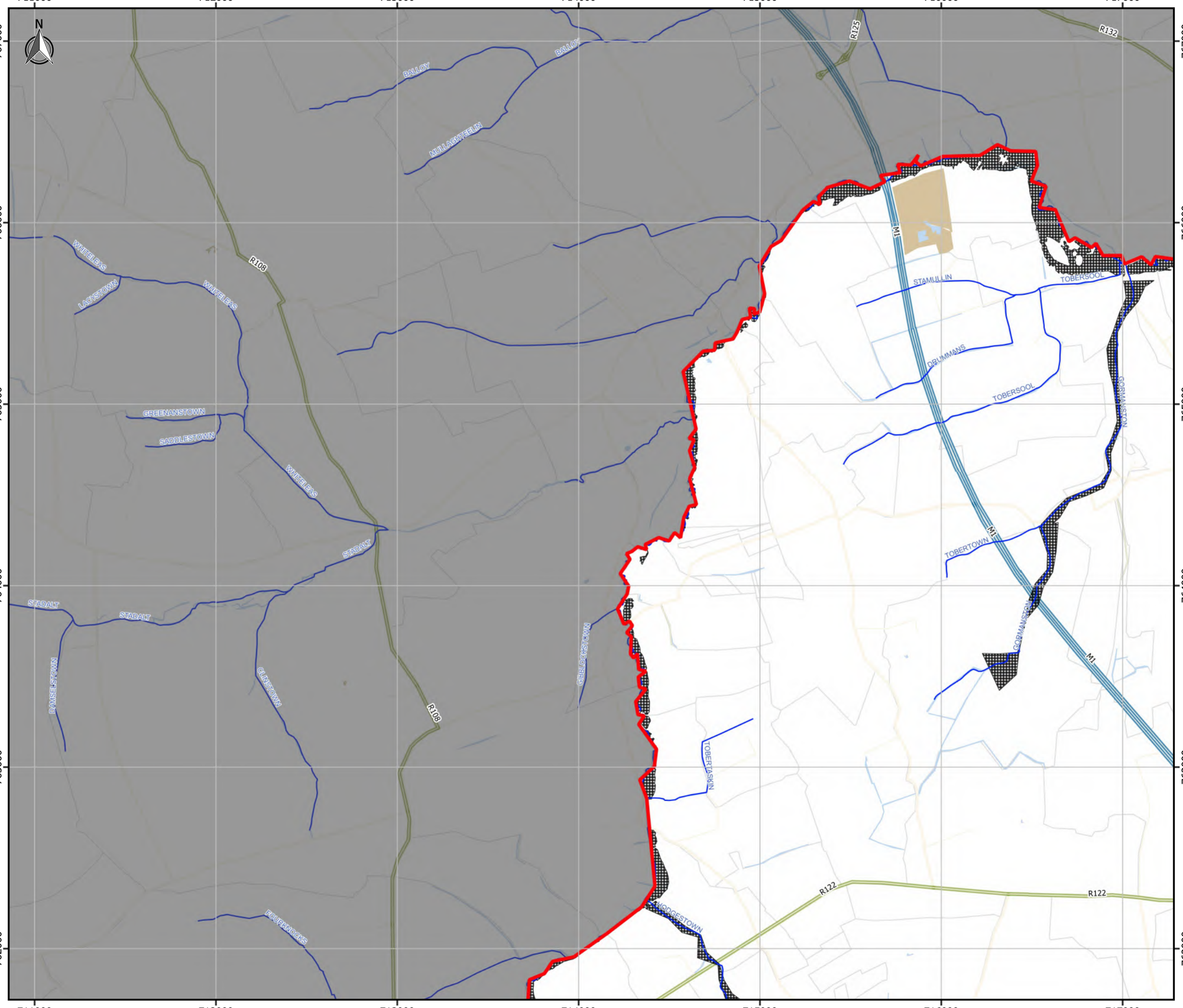
MAP: SFRA FLOOD MAP OVERVIEW / LOCATION PLAN			**SOURCE CRS:**	ITM EPSG:2157	**DRAWN BY:**	DL	DATE: 10/11/2021
DRAWING NUMBER: M02127-06_FIG_FL100			**DRAWING SCALE:**	AS SHOWN @ A3	**CHECKED BY:**	PS	DATE: 10/11/2021
REV: 01	**NOTE:** 1ST ISSUE	**DATE:** 10/11/2021	**MAP SERIES:**	PAGE 01 OF 26	**APPROVED BY:**	DKS	DATE: 10/11/2021



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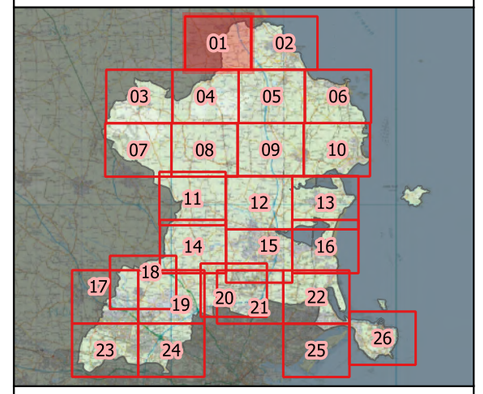

LEGEND

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MAP: HIGH END FUTURE SCENARIO FLOOD EXTENT		
FLOOD PROBABILITY: FLUVIAL: 1% / 0.1%		COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
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CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021
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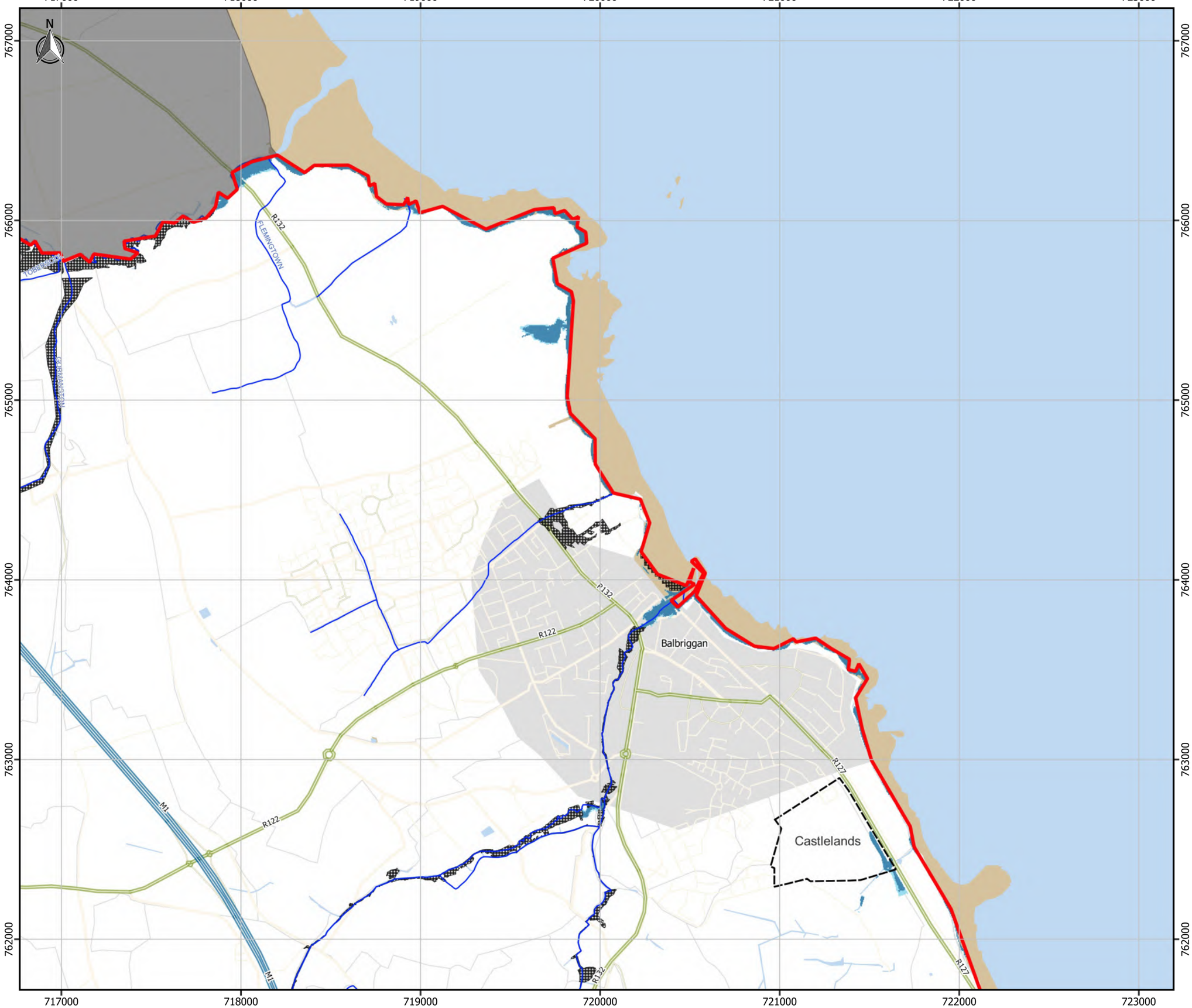

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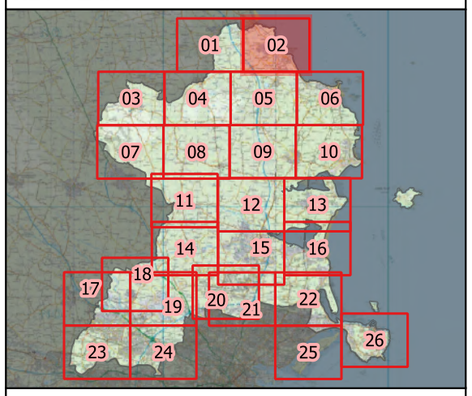

LEGEND

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MAP:	HIGH END FUTURE SCENARIO FLOOD EXTENT	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
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CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021
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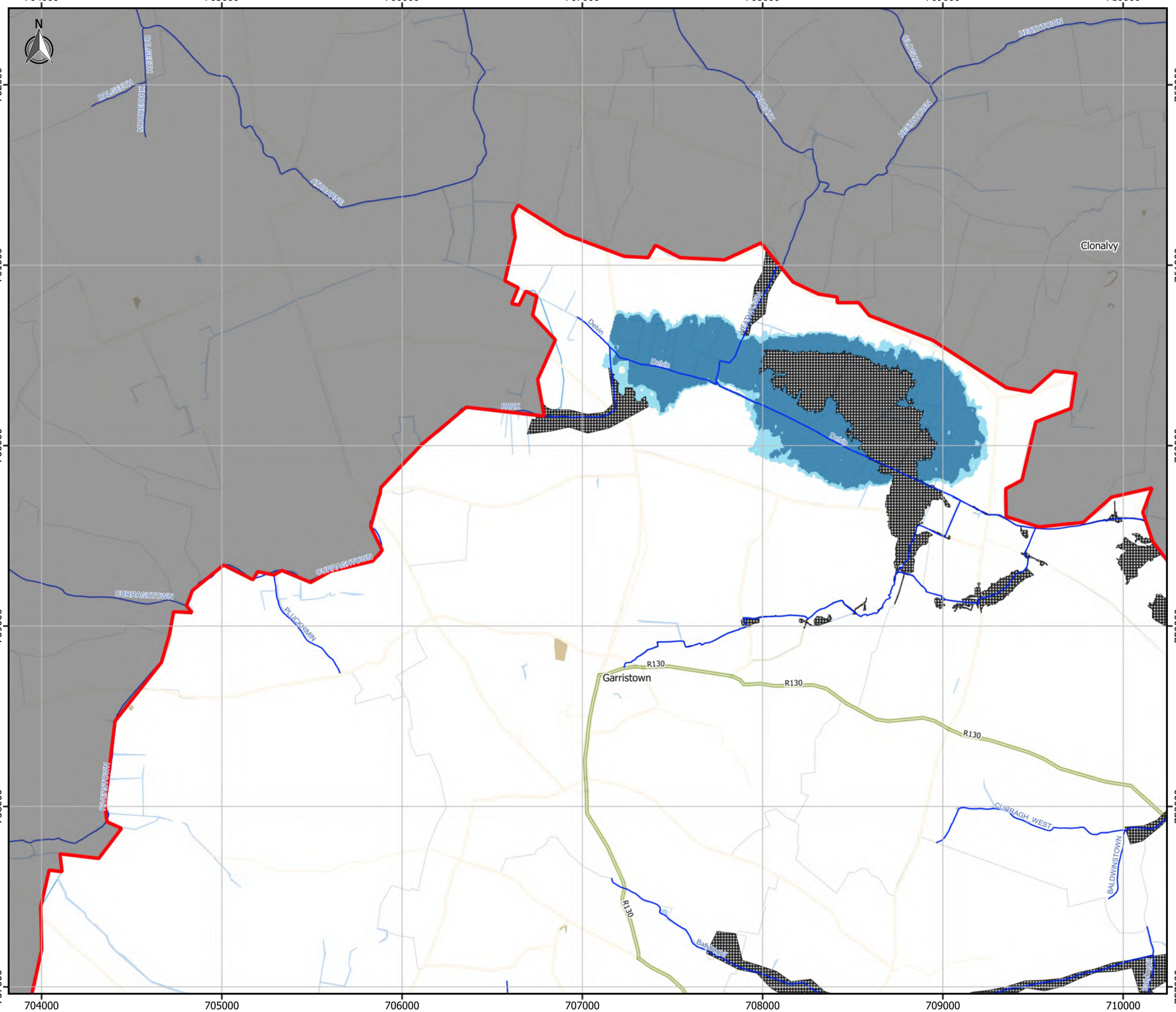
MAP SERIES:		PAGE 02 OF 26
DRAWING SCALE:		1:20000 @ A3



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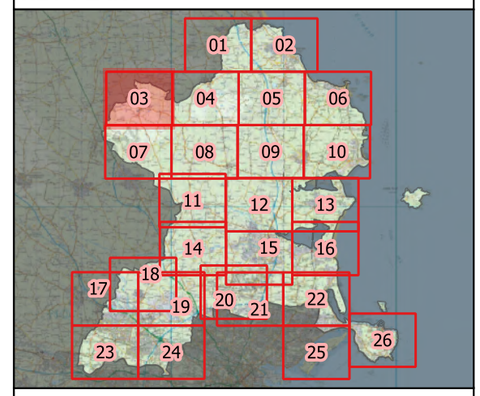

LEGEND

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MAP: HIGH END FUTURE SCENARIO FLOOD EXTENT

FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
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CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL303

MAP SERIES:	PAGE 03 OF 26
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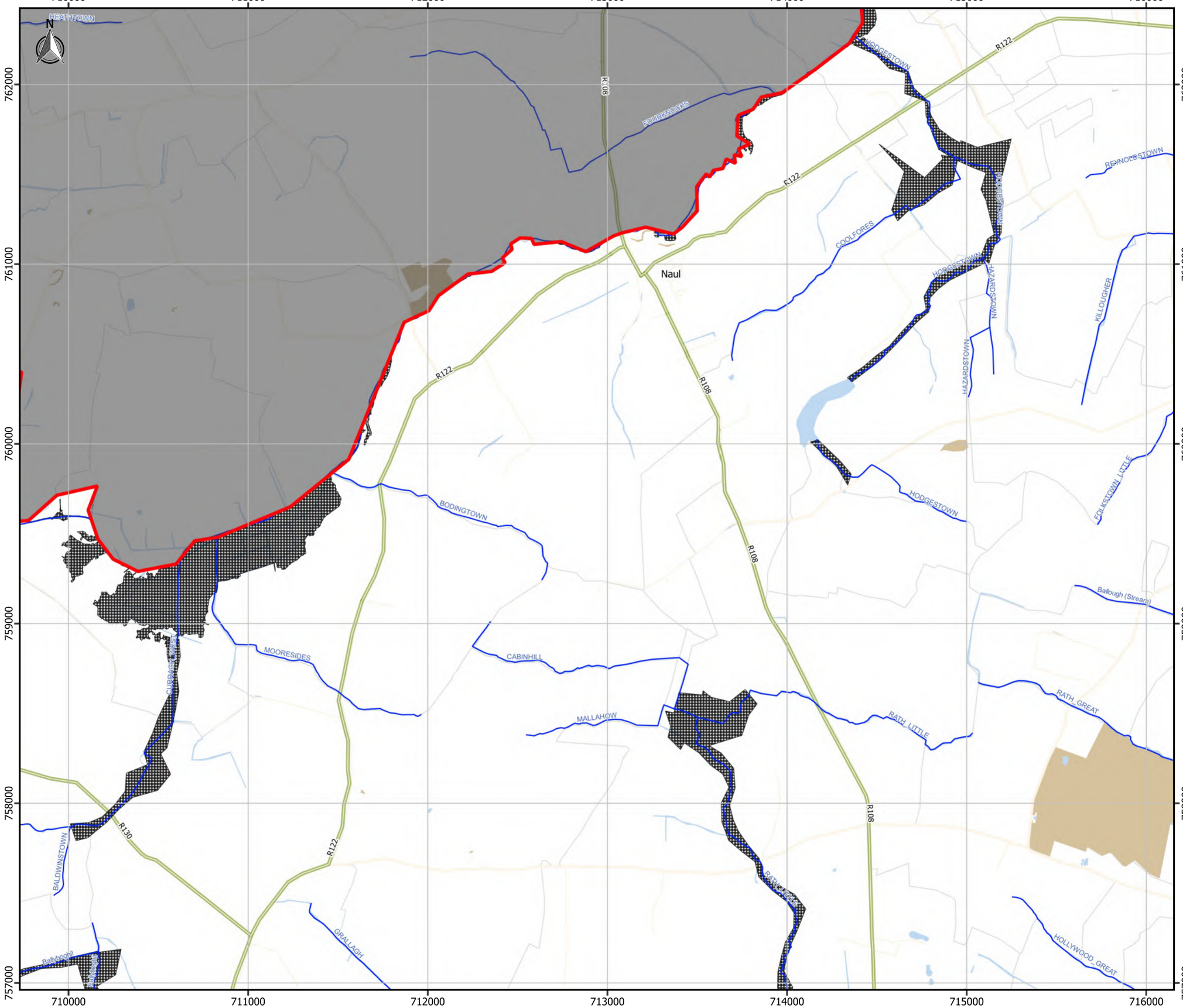

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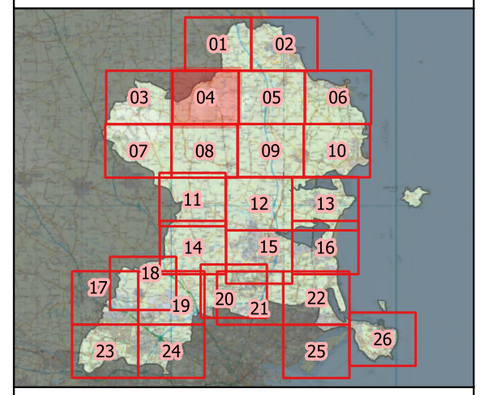

LEGEND

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MAP: HIGH END FUTURE SCENARIO FLOOD EXTENT

FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
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CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL304

MAP SERIES:	PAGE 04 OF 26
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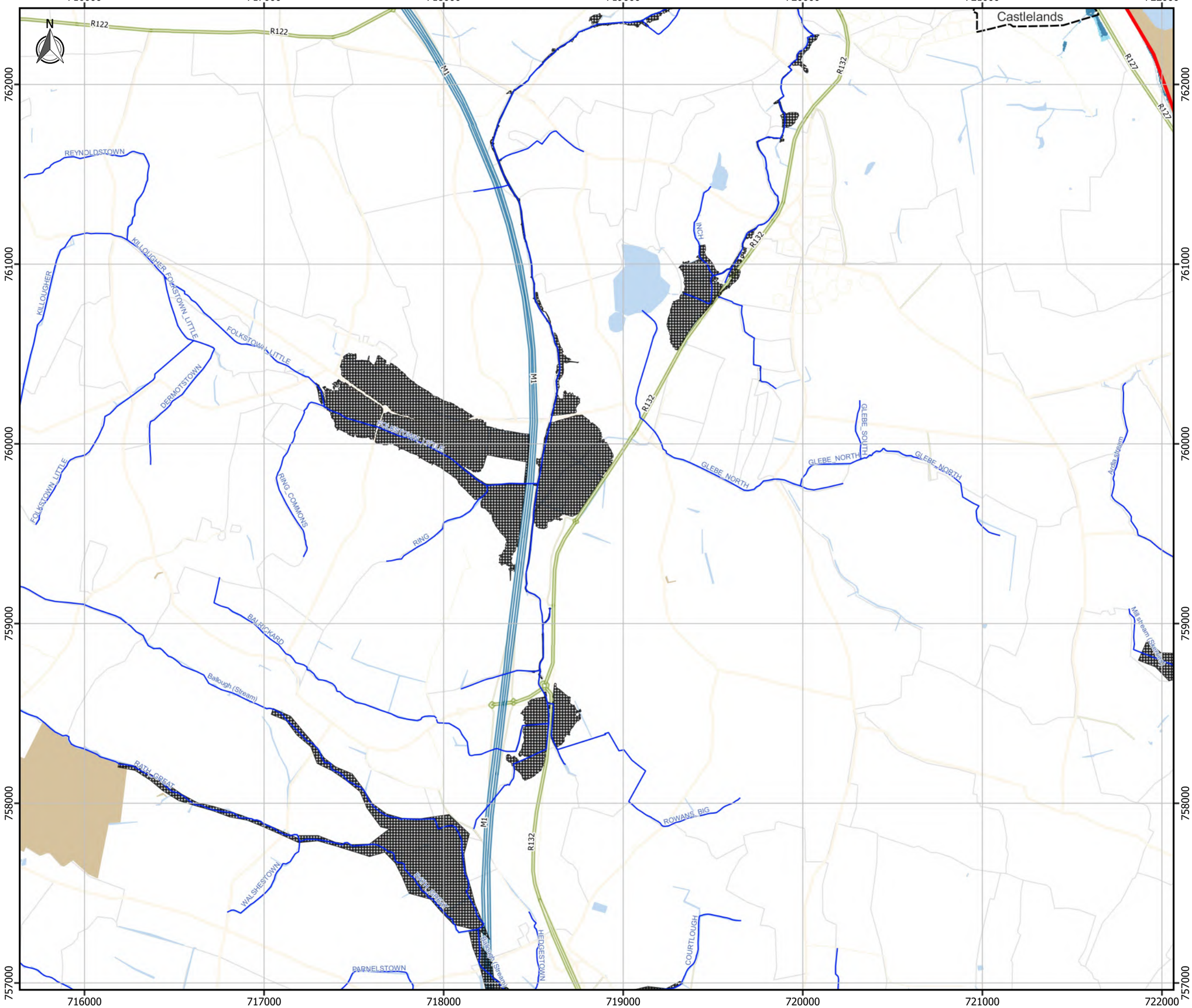

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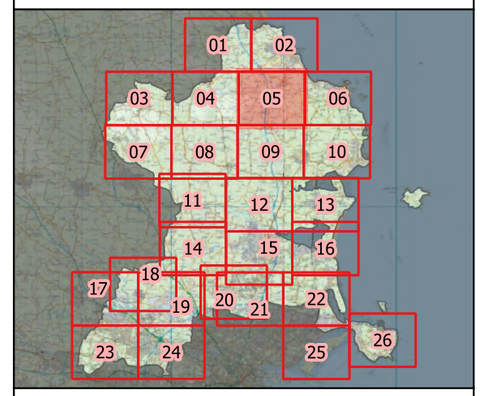

LEGEND

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MAP:	HIGH END FUTURE SCENARIO FLOOD EXTENT	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
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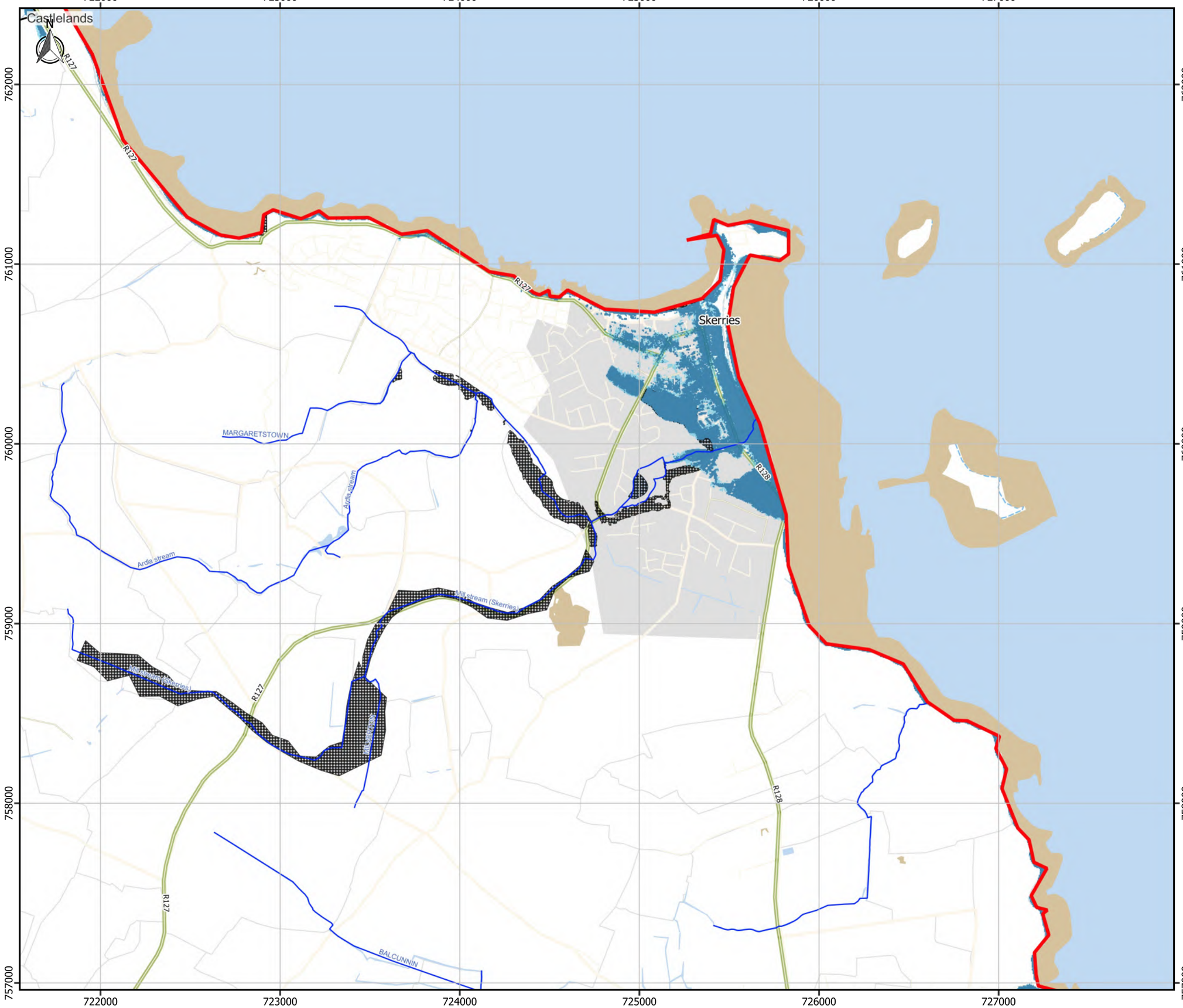

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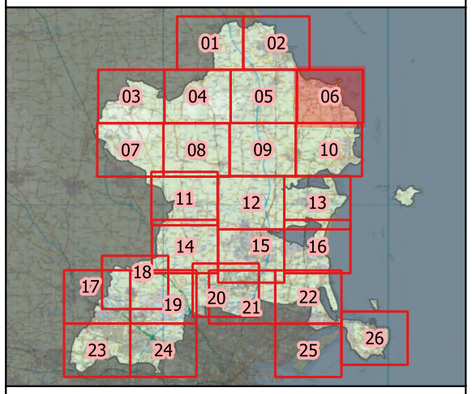

LEGEND

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MAP:	HIGH END FUTURE SCENARIO FLOOD EXTENT	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
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CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021
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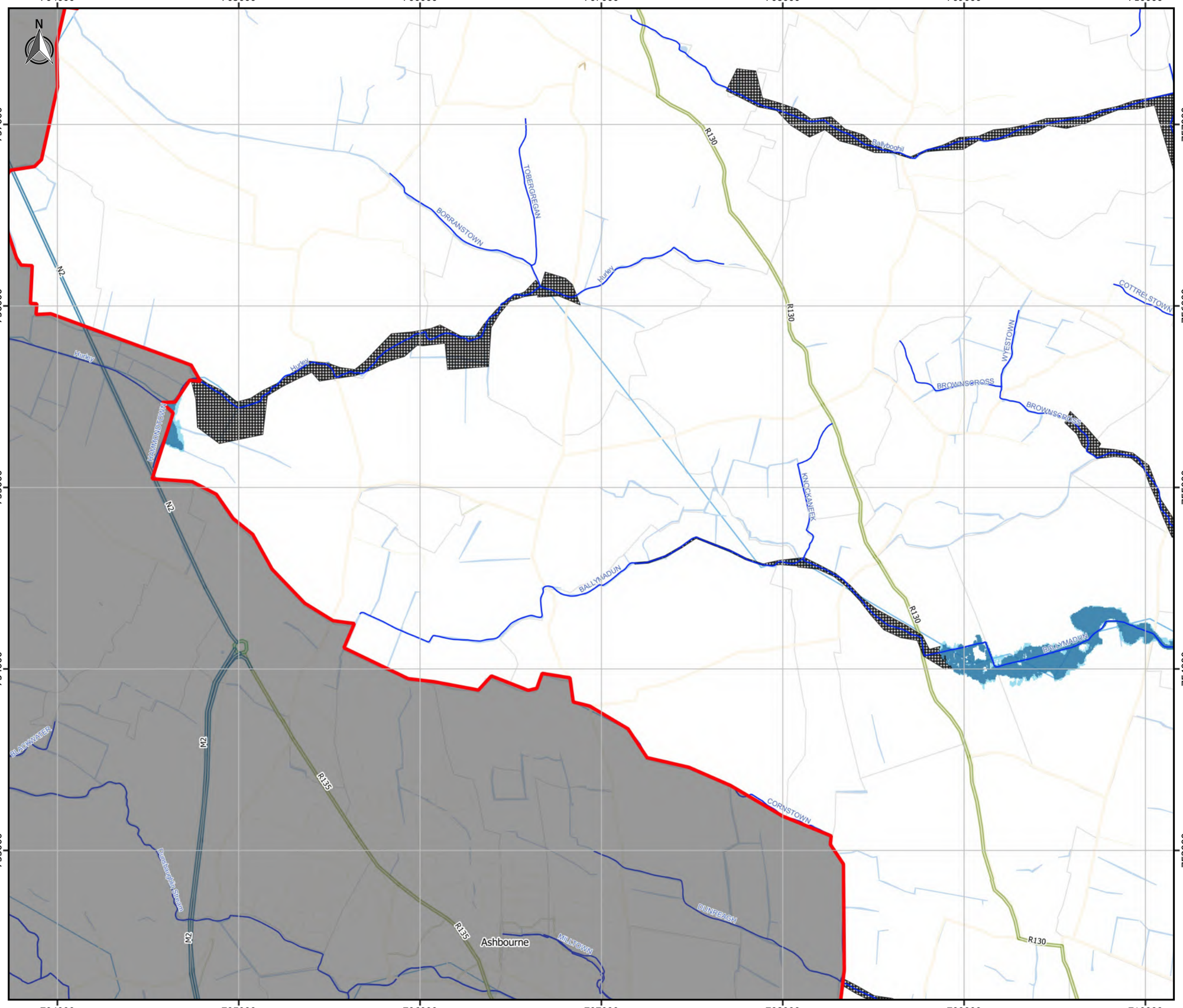

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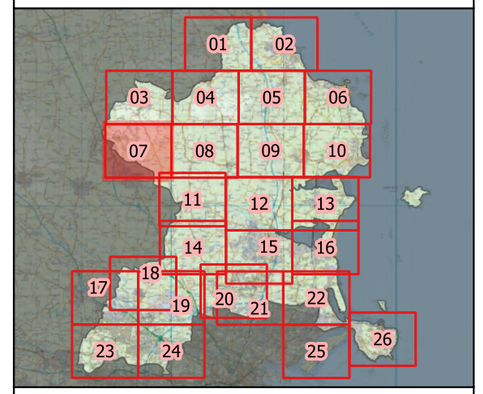

LEGEND

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MAP: HIGH END FUTURE SCENARIO FLOOD EXTENT

FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL307

MAP SERIES:	PAGE 07 OF 26
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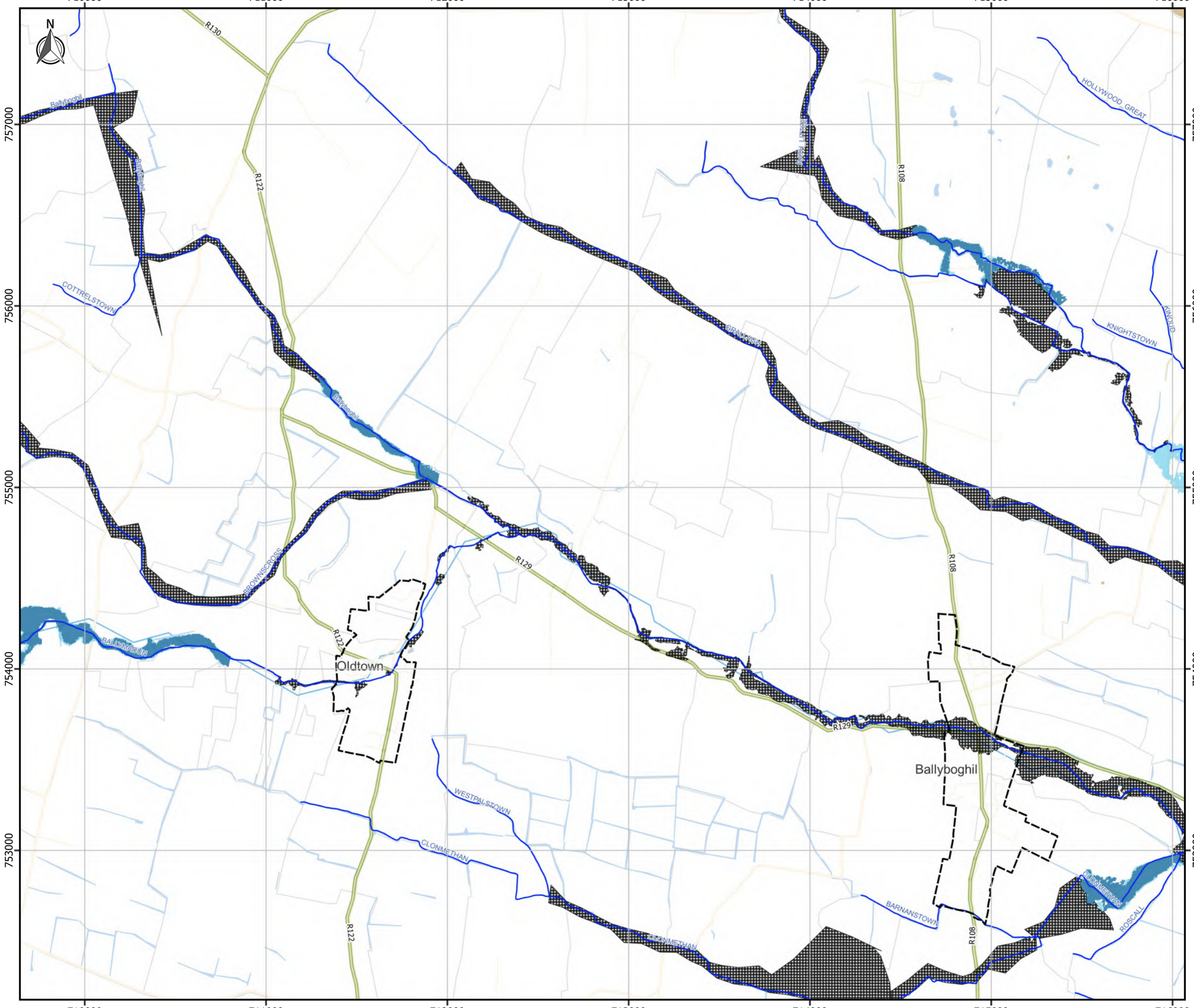

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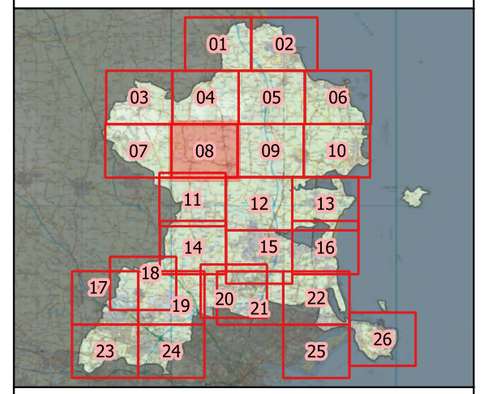

LEGEND

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MAP: HIGH END FUTURE SCENARIO FLOOD EXTENT

FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
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APPROVED BY:	DKS	DATE: 01/12/2021
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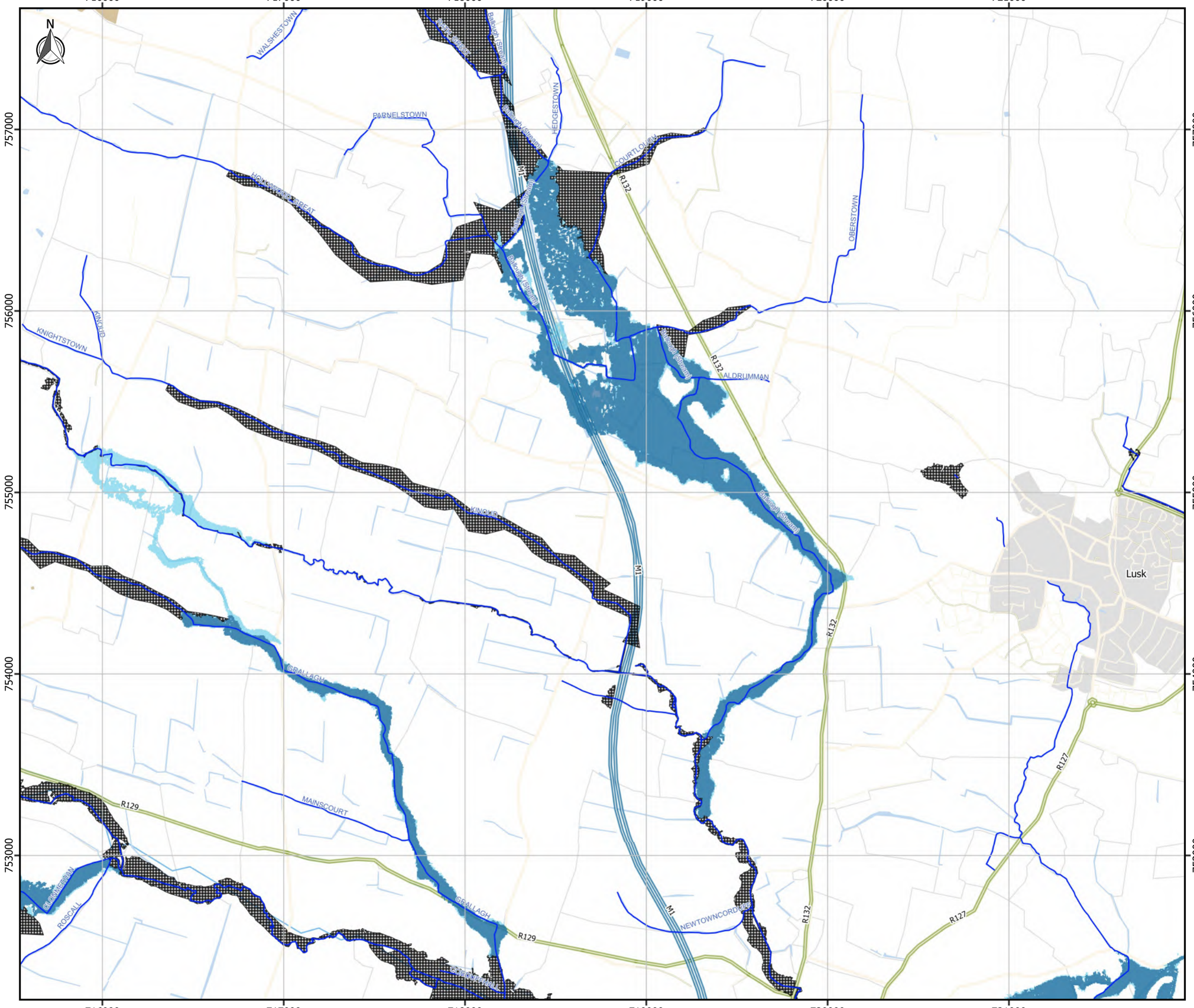

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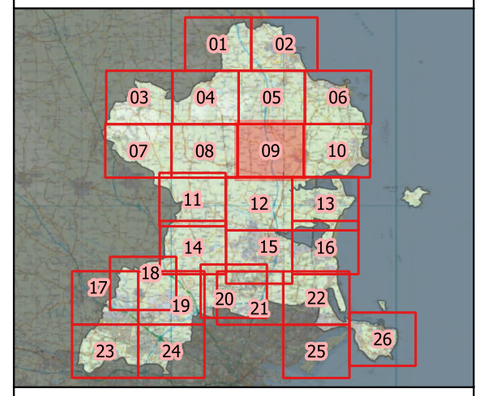

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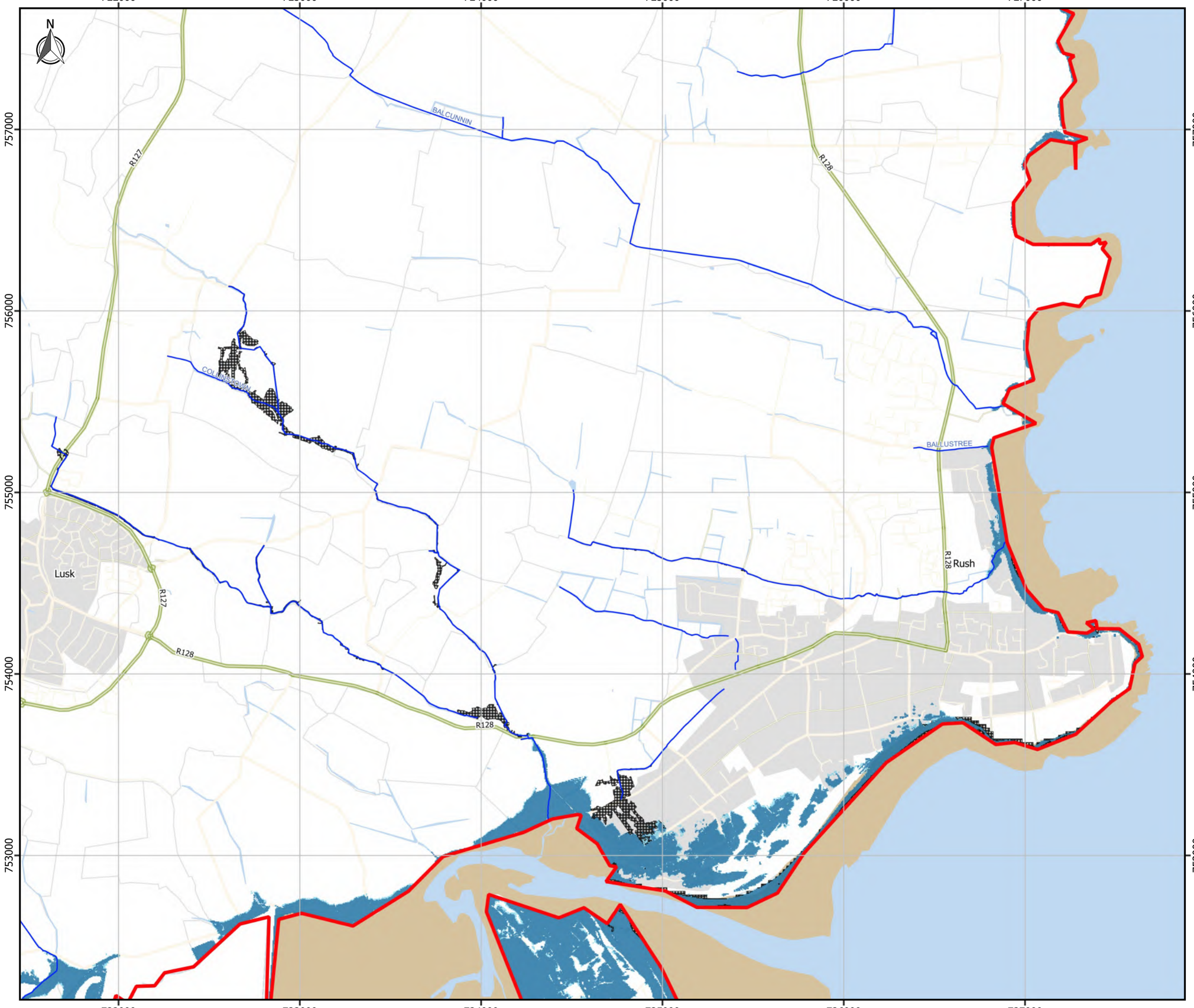
MAP:	HIGH END FUTURE SCENARIO FLOOD EXTENT	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021
DRAWING NUMBER:	M02127-06_FIG_FL309	
MAP SERIES:		PAGE 09 OF 26
DRAWING SCALE:		1:20000 @ A3



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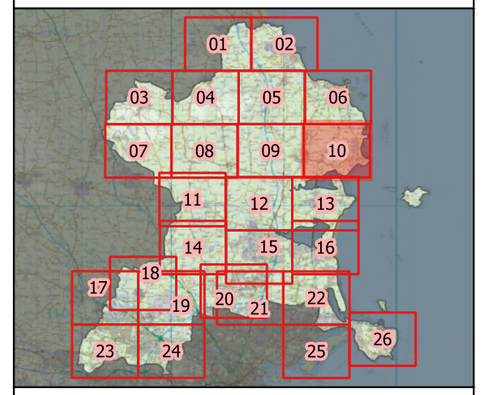

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP HEFS Flood Extent
- 0.1% AEP HEFS Flood Extent
- No Climate Change Data Available; Present Day Flood Data Only.CC Flood Risk Subject to Site Specific Assessment
- Area for Further Consideration

REV:	NOTE:	DATE:
02	DRAFT ISSUE	01/12/2021

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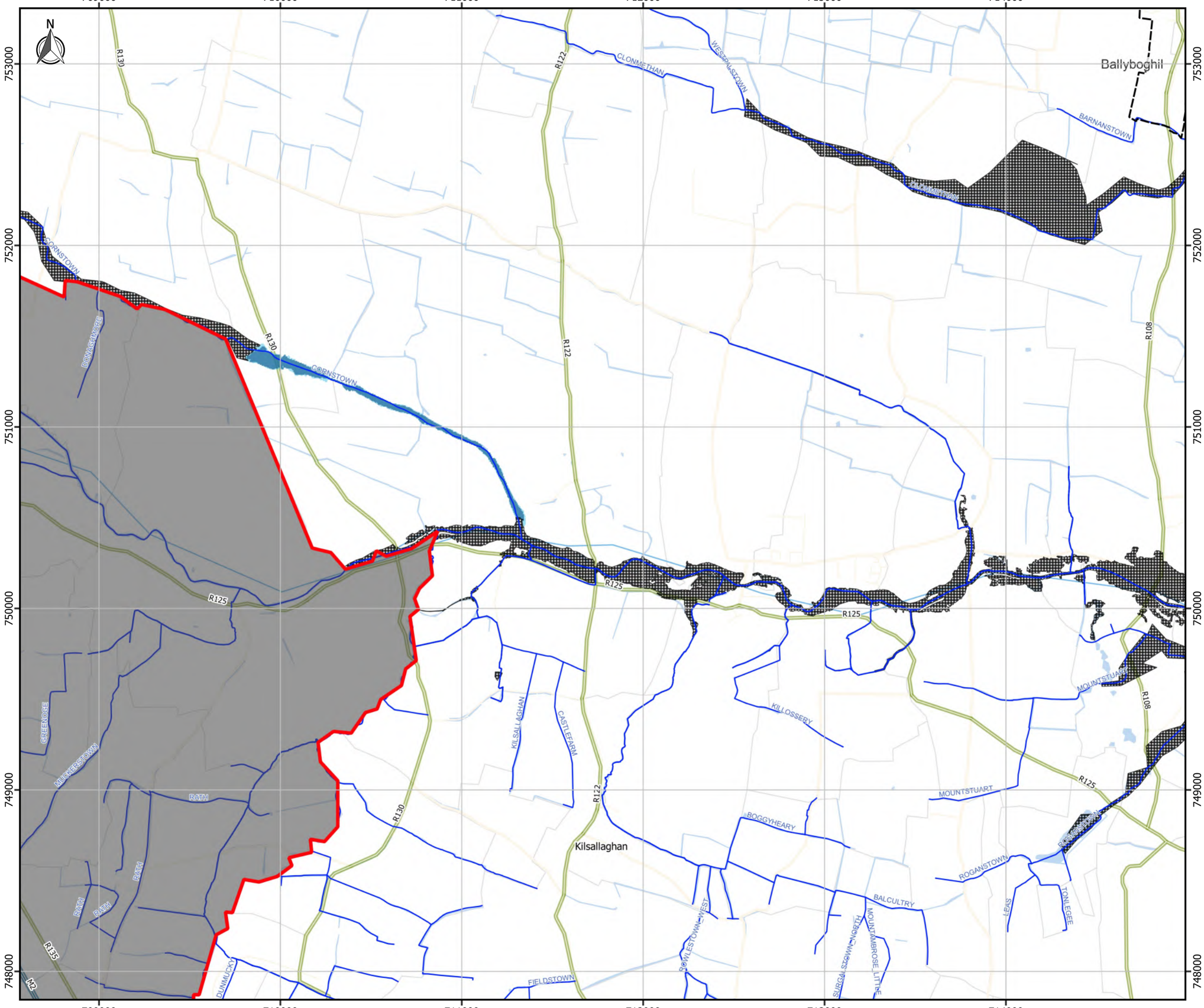
MAP: HIGH END FUTURE SCENARIO FLOOD EXTENT

FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021
DRAWING NUMBER:		M02127-06_FIG_FL310
MAP SERIES:		PAGE 10 OF 26
DRAWING SCALE:		1:20000 @ A3



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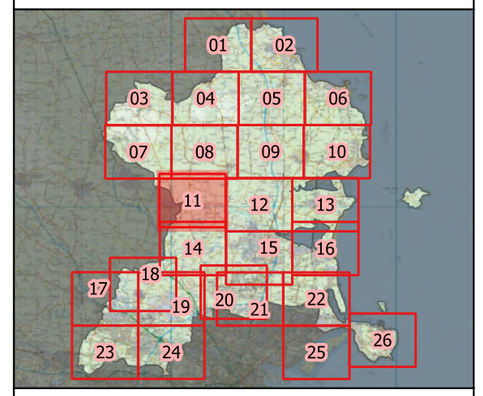

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP HEFS Flood Extent
- 0.1% AEP HEFS Flood Extent
- No Climate Change Data Available; Present Day Flood Data Only.CC Flood Risk Subject to Site Specific Assessment
- Area for Further Consideration

REV:	NOTE:	DATE:
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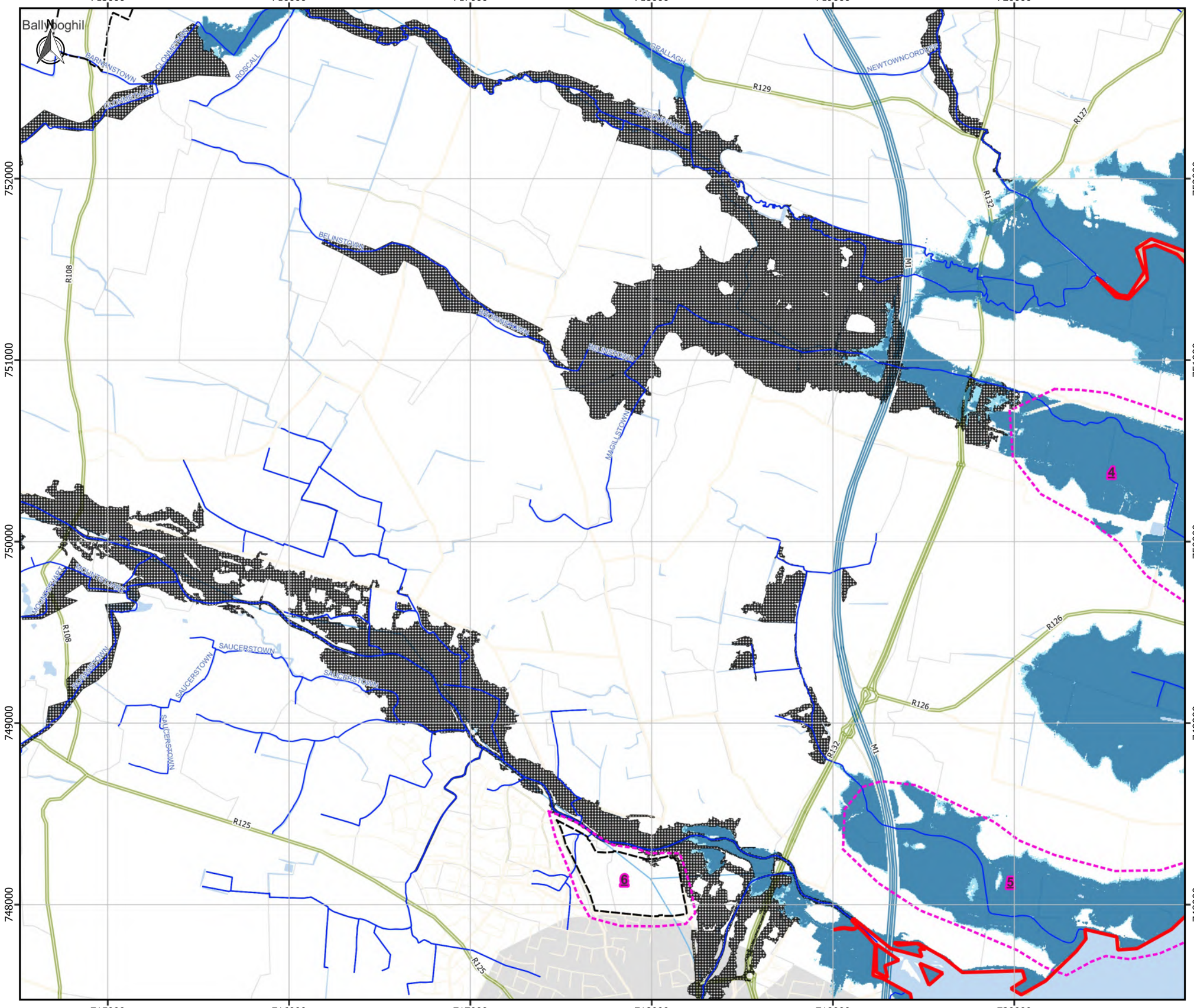
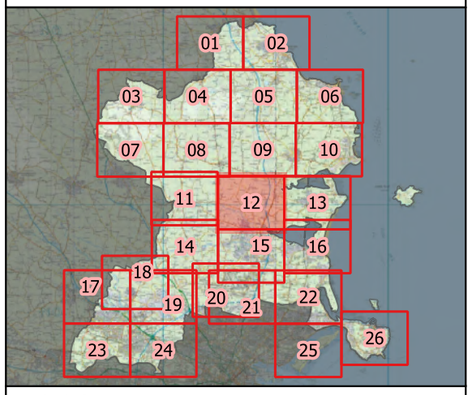
MAP:	HIGH END FUTURE SCENARIO FLOOD EXTENT	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021
DRAWING NUMBER:	M02127-06_FIG_FL311	
MAP SERIES:		PAGE 11 OF 26
DRAWING SCALE:		1:20000 @ A3



KEY PLAN



LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP HEFS Flood Extent
- 0.1% AEP HEFS Flood Extent
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REV:	NOTE:	DATE:
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MAP:	HIGH END FUTURE SCENARIO FLOOD EXTENT	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021
DRAWING NUMBER:	M02127-06_FIG_FL312	
MAP SERIES:		PAGE 12 OF 26
DRAWING SCALE:		1:20000 @ A3

721000 722000 723000 724000 725000 726000

752000 751000 750000 749000 748000

N

R127

Rahillion

Turvey

Ballymastone

Donabate

Corballis East

Corballis Nature Park

R126

LAWESTOWN

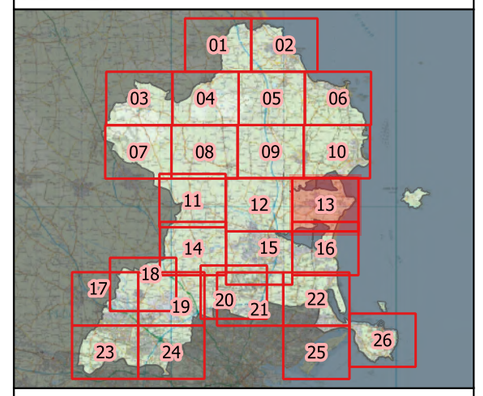
BALLALEASE NORTH

BALLALEASE

1 2 3 4 5

0 0.5 1 km

KEY PLAN



LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP HEFS Flood Extent
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REV:	NOTE:	DATE:
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MAP: HIGH END FUTURE SCENARIO FLOOD EXTENT

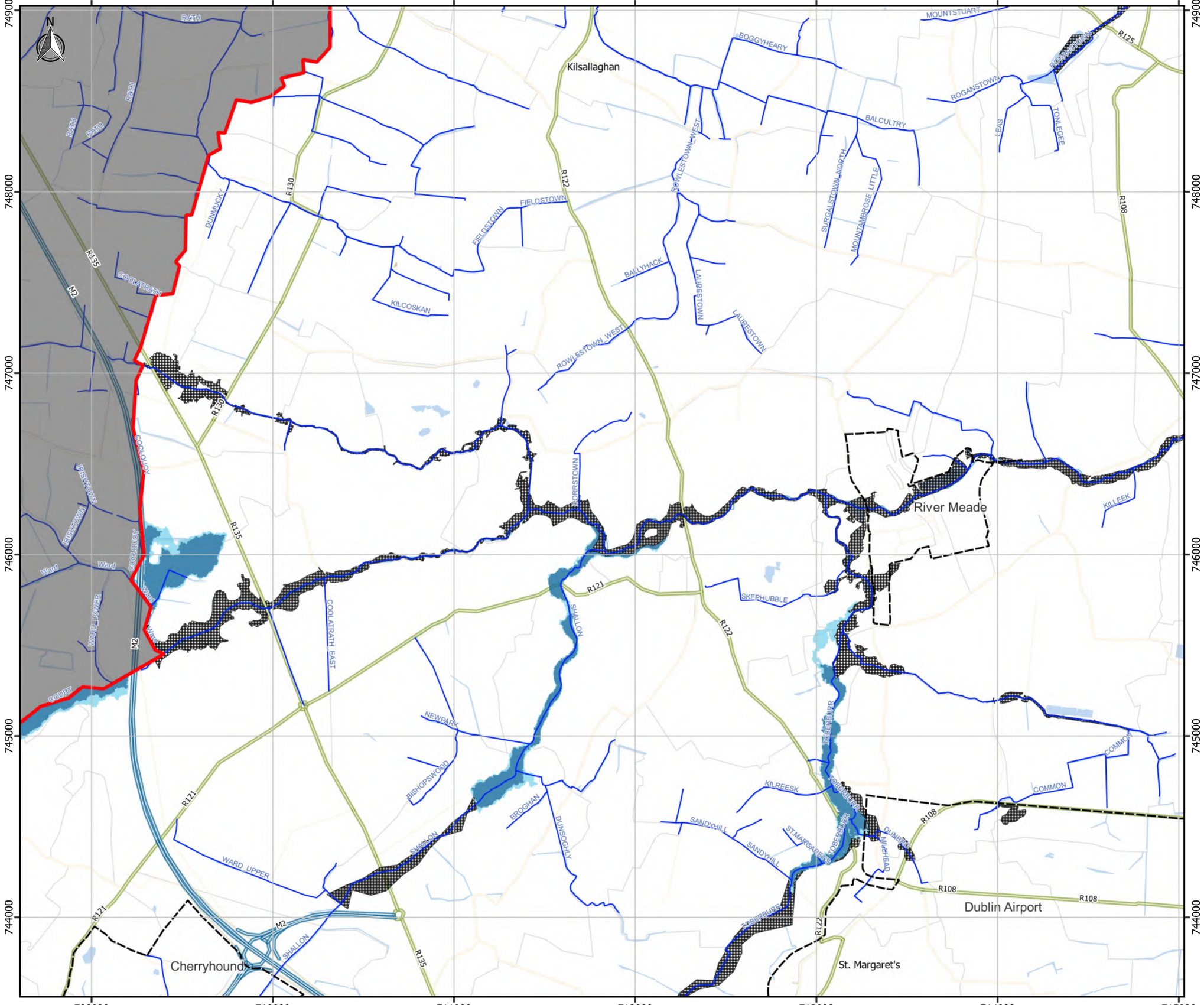
FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

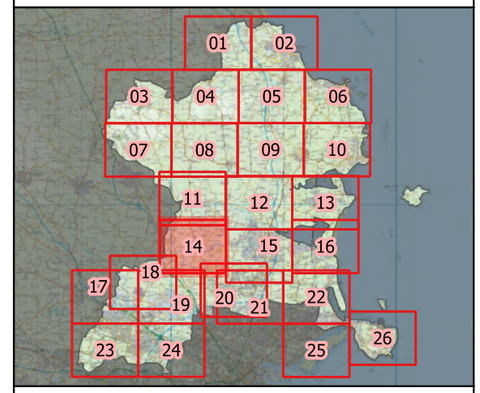
DRAWING NUMBER: M02127-06_FIG_FL313

MAP SERIES:	PAGE 13 OF 26
DRAWING SCALE:	1:20000 @ A3



0 0.5 1 km

KEY PLAN



LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP HEFS Flood Extent
- 0.1% AEP HEFS Flood Extent
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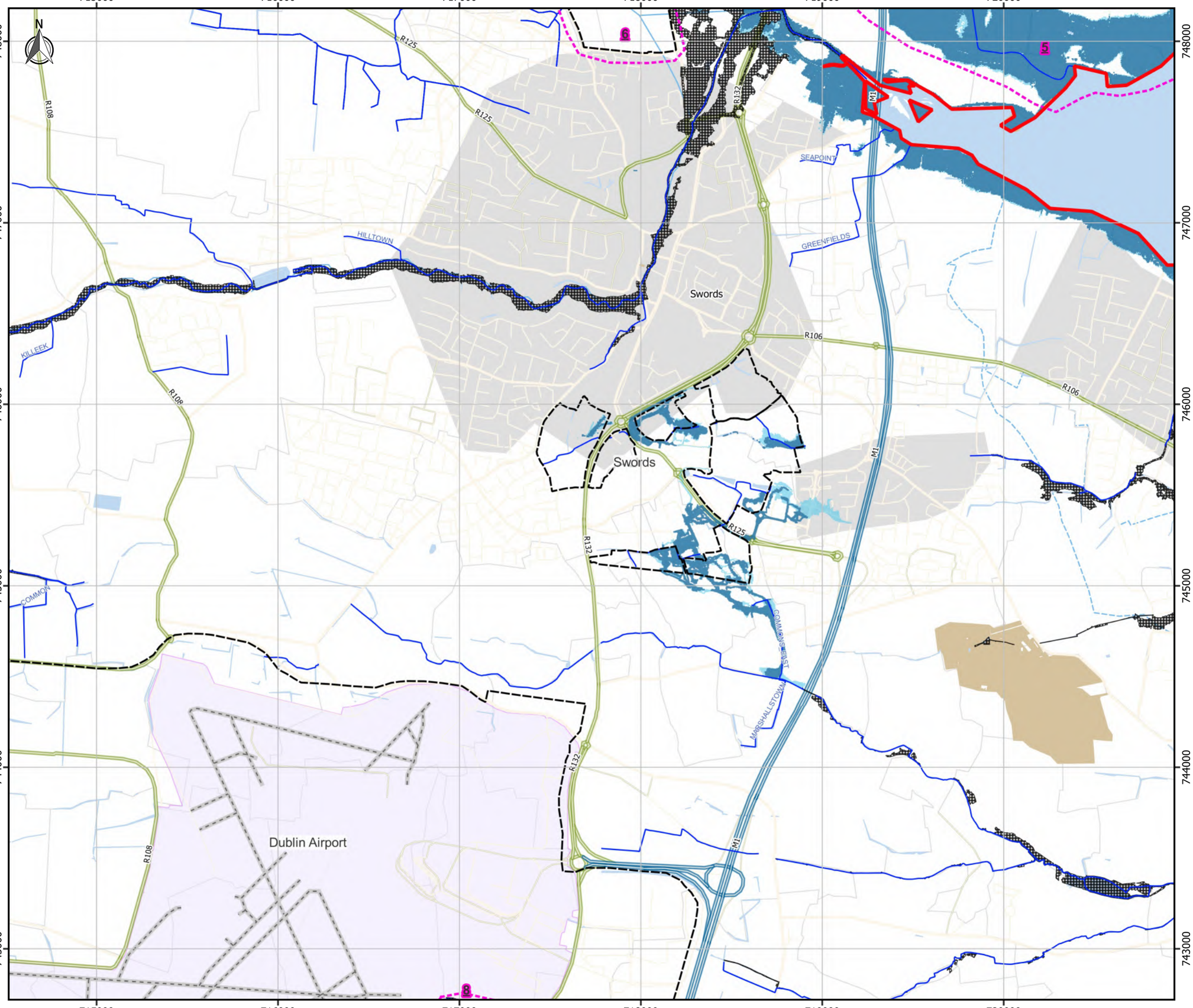
MAP:	HIGH END FUTURE SCENARIO FLOOD EXTENT	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021
DRAWING NUMBER:	M02127-06_FIG_FL314	
MAP SERIES:		PAGE 14 OF 26
DRAWING SCALE:		1:20000 @ A3



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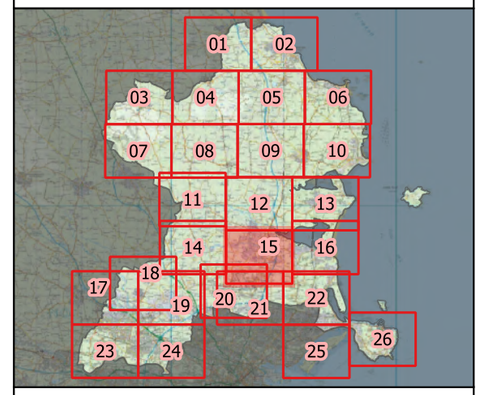

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP HEFS Flood Extent
- 0.1% AEP HEFS Flood Extent
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REV:	NOTE:	DATE:
02	DRAFT ISSUE	01/12/2021

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MAP: HIGH END FUTURE SCENARIO FLOOD EXTENT

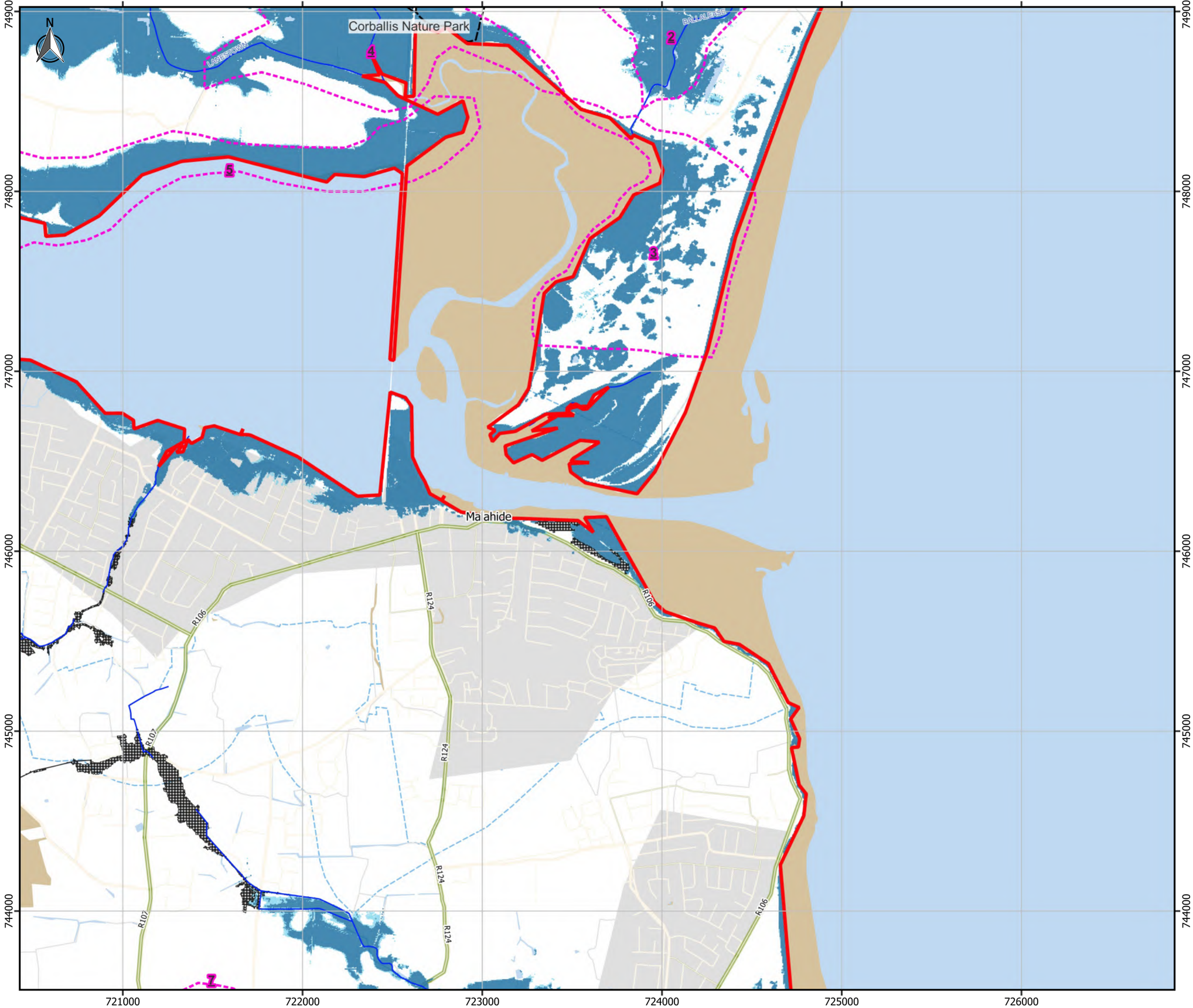
FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL315

MAP SERIES:	PAGE 15 OF 26
DRAWING SCALE:	1:20000 @ A3



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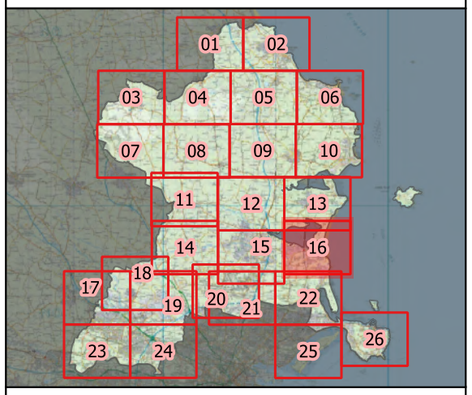

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP HEFS Flood Extent
- 0.1% AEP HEFS Flood Extent
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REV:	NOTE:	DATE:
02	DRAFT ISSUE	01/12/2021

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MAP: HIGH END FUTURE SCENARIO FLOOD EXTENT

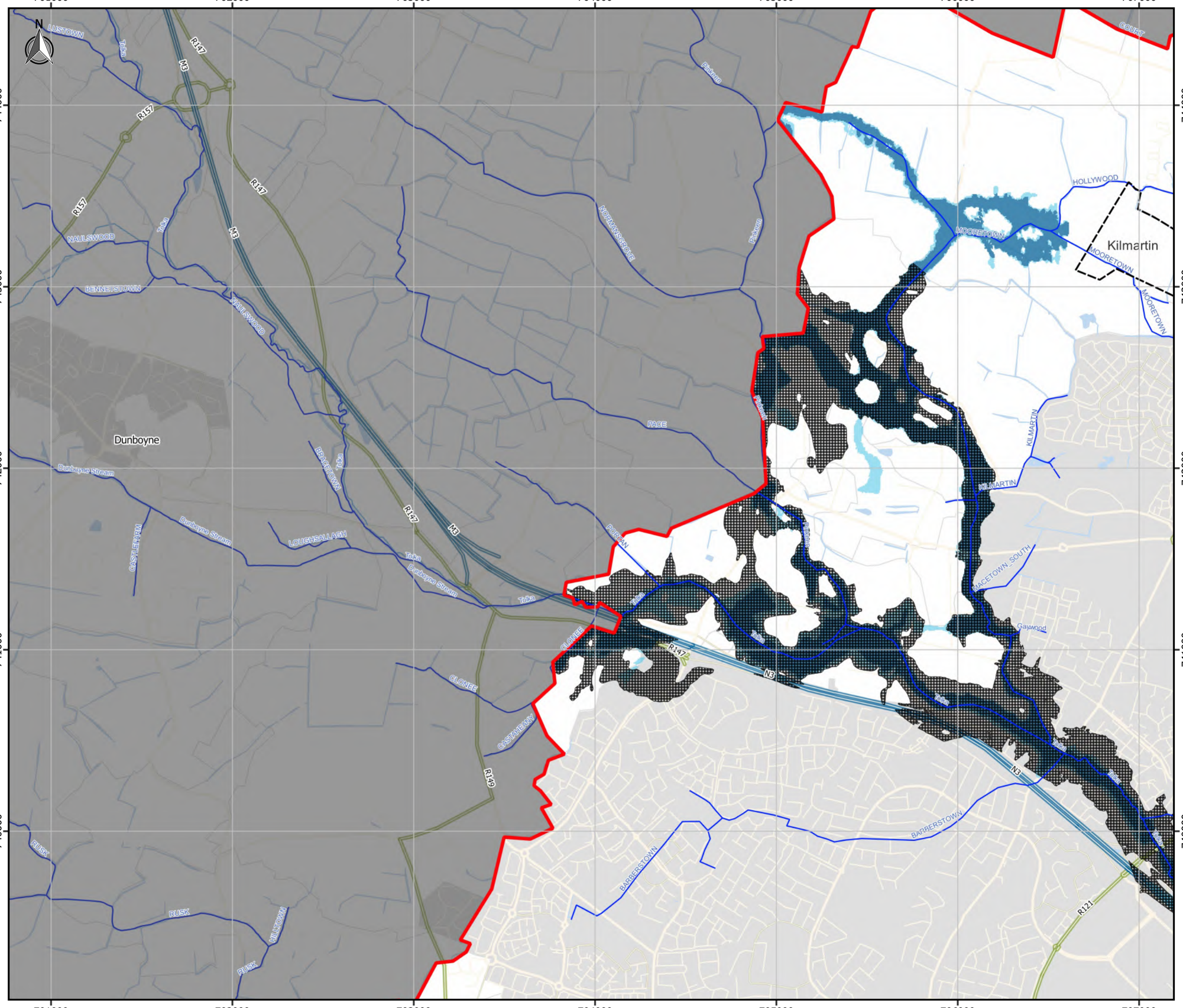
FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL316

MAP SERIES:	PAGE 16 OF 26
DRAWING SCALE:	1:20000 @ A3



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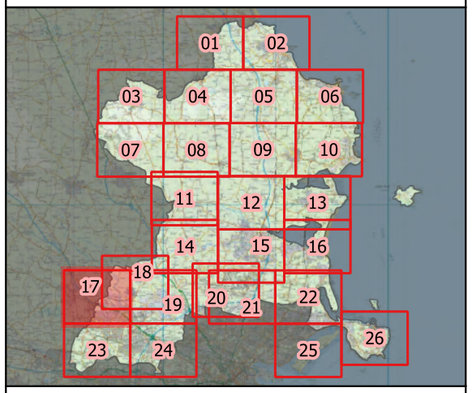

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP HEFS Flood Extent
- 0.1% AEP HEFS Flood Extent
- No Climate Change Data Available; Present Day Flood Data Only.CC Flood Risk Subject to Site Specific Assessment
- Area for Further Consideration

REV:	NOTE:	DATE:
02	DRAFT ISSUE	01/12/2021

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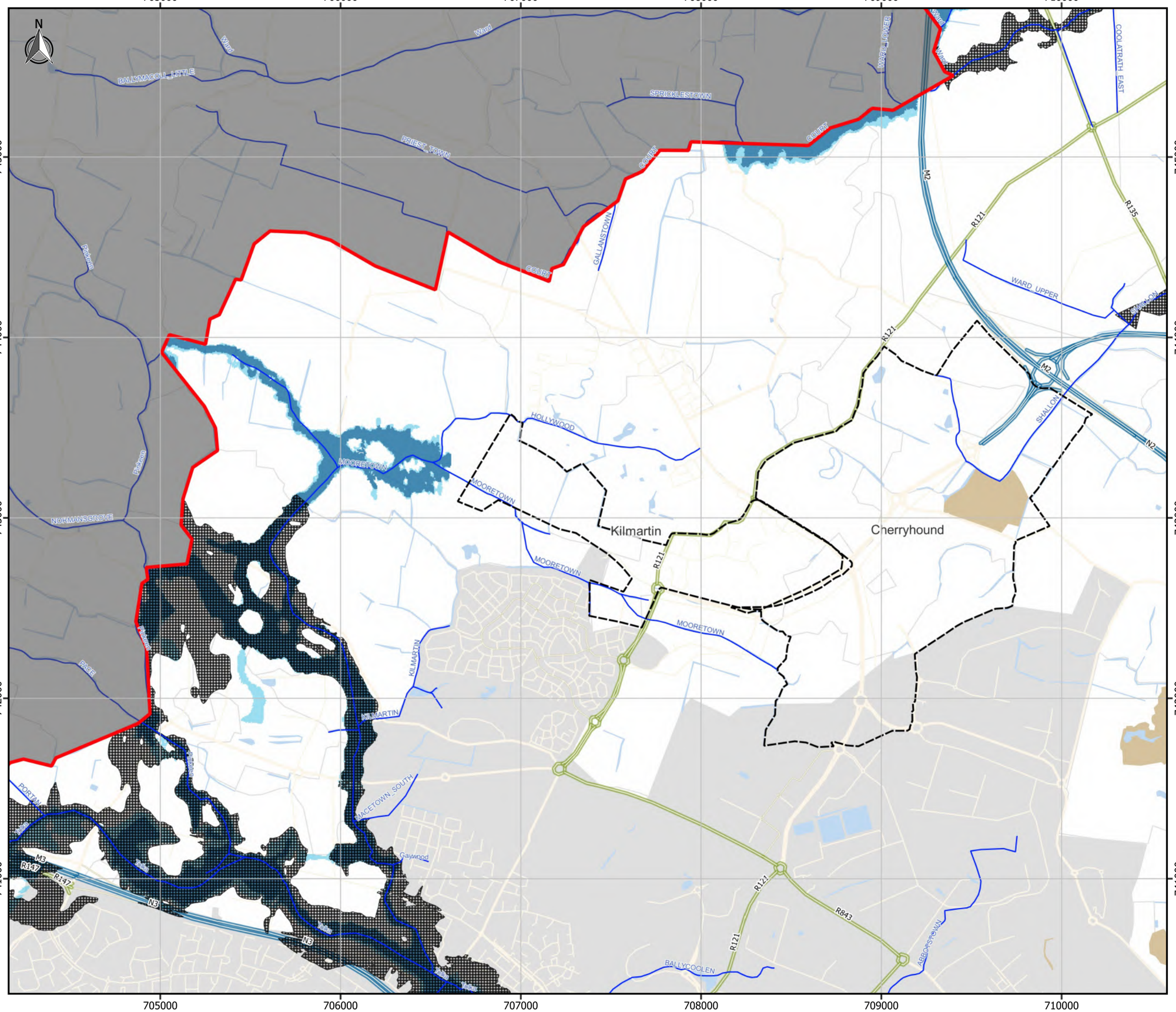
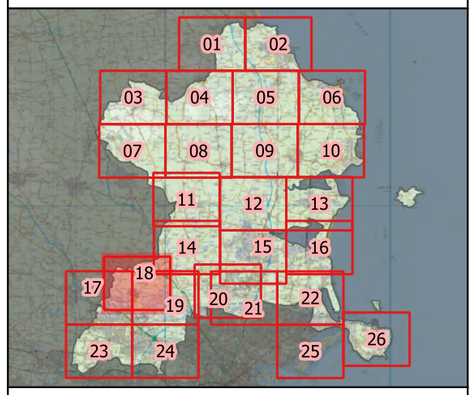
MAP:	HIGH END FUTURE SCENARIO FLOOD EXTENT	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021
DRAWING NUMBER:	M02127-06_FIG_FL317	
MAP SERIES:		PAGE 17 OF 26
DRAWING SCALE:		1:20000 @ A3



KEY PLAN



LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP HEFS Flood Extent
- 0.1% AEP HEFS Flood Extent
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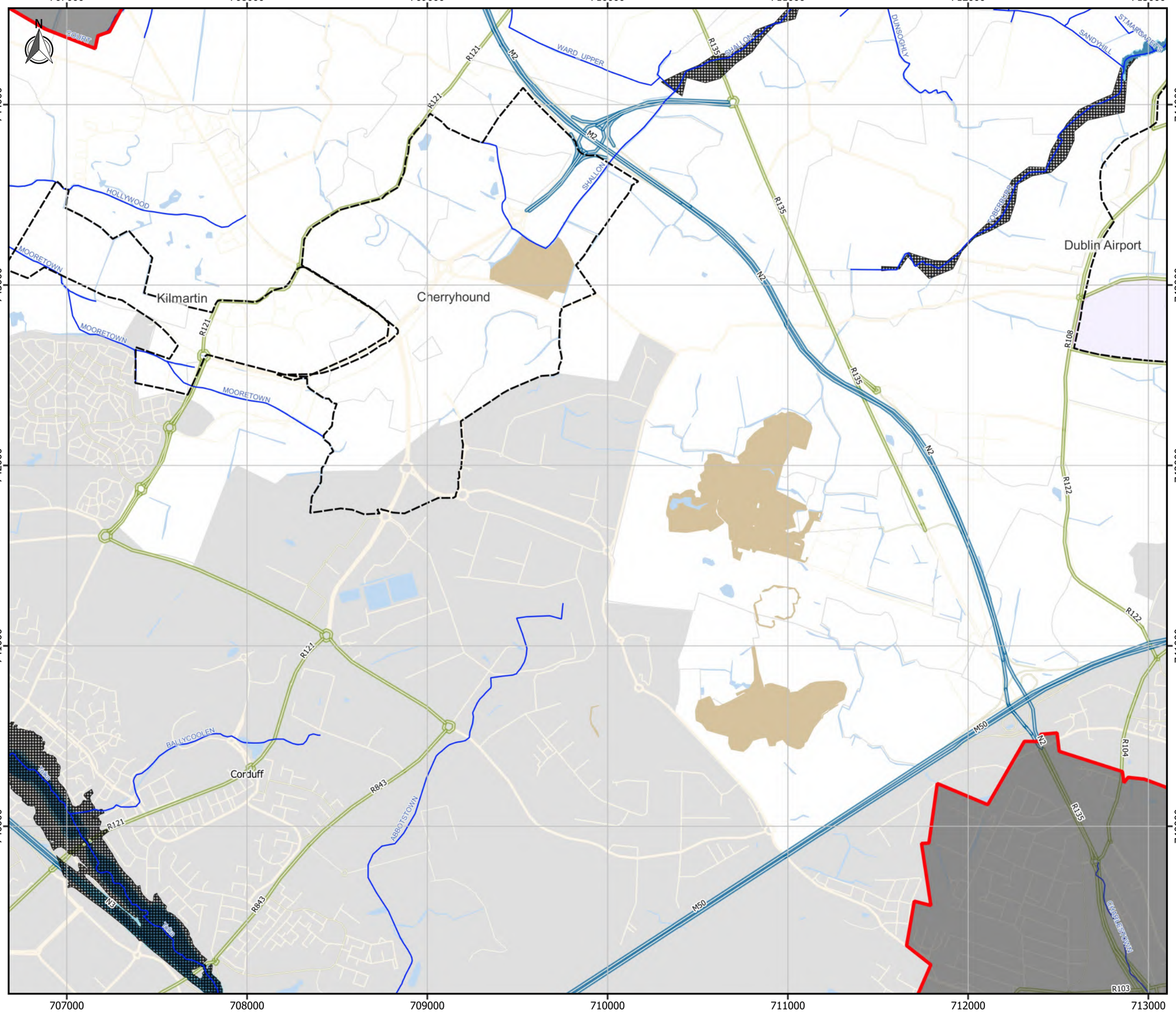
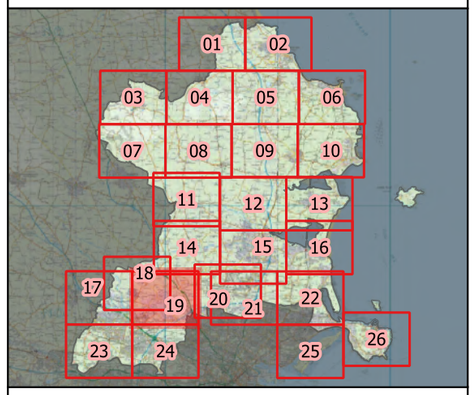
MAP:	HIGH END FUTURE SCENARIO FLOOD EXTENT	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021
DRAWING NUMBER:	M02127-06_FIG_FL318	
MAP SERIES:		PAGE 18 OF 26
DRAWING SCALE:		1:20000 @ A3



KEY PLAN



LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP HEFS Flood Extent
- 0.1% AEP HEFS Flood Extent
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REV:	NOTE:	DATE:
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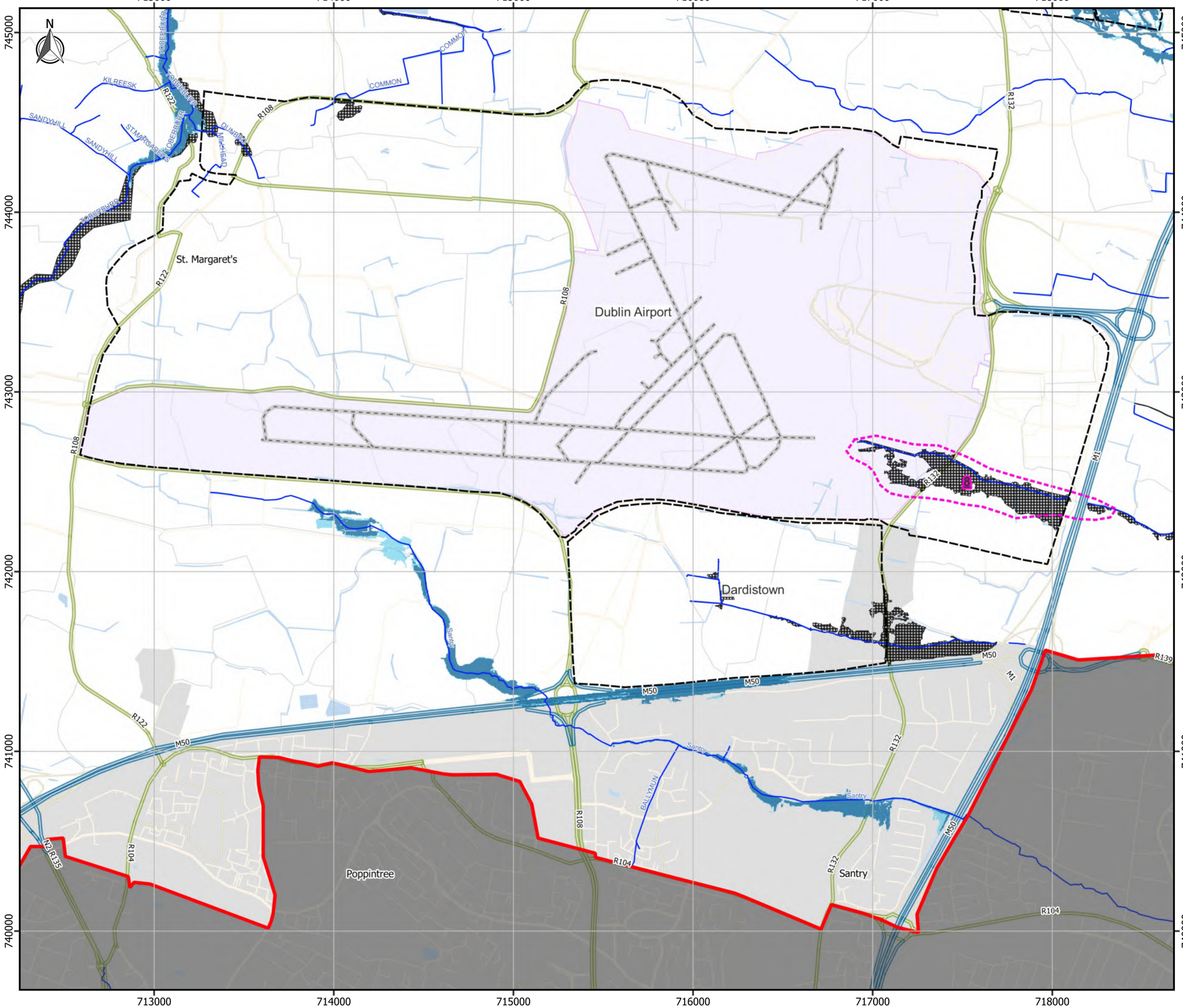
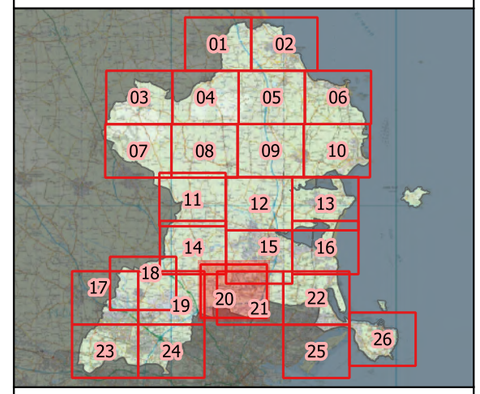
MAP:	HIGH END FUTURE SCENARIO FLOOD EXTENT	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021
DRAWING NUMBER:	M02127-06_FIG_FL319	
MAP SERIES:		PAGE 19 OF 26
DRAWING SCALE:		1:20000 @ A3



KEY PLAN



LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP HEFS Flood Extent
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MAP: HIGH END FUTURE SCENARIO FLOOD EXTENT

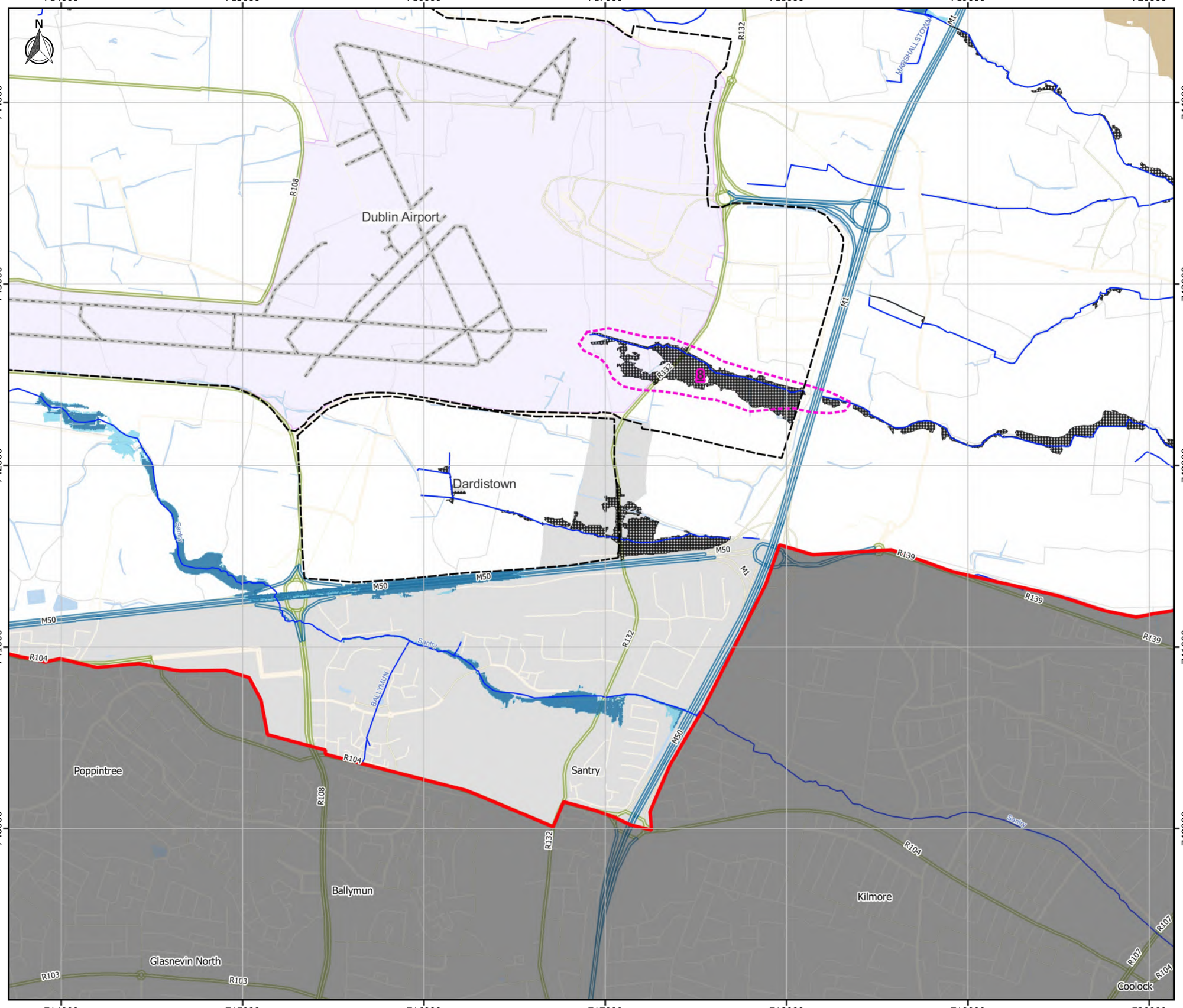
FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

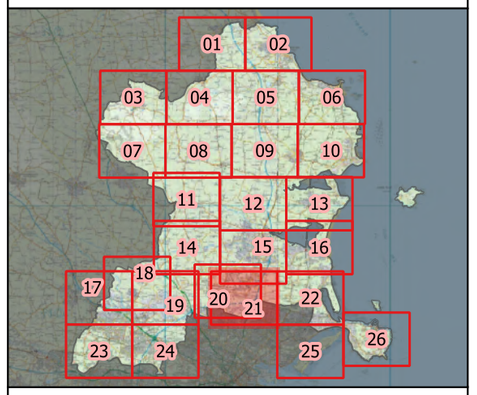
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL320

MAP SERIES:	PAGE 20 OF 26
DRAWING SCALE:	1:20000 @ A3



KEY PLAN



LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP HEFS Flood Extent
- 0.1% AEP HEFS Flood Extent
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REV:	NOTE:	DATE:
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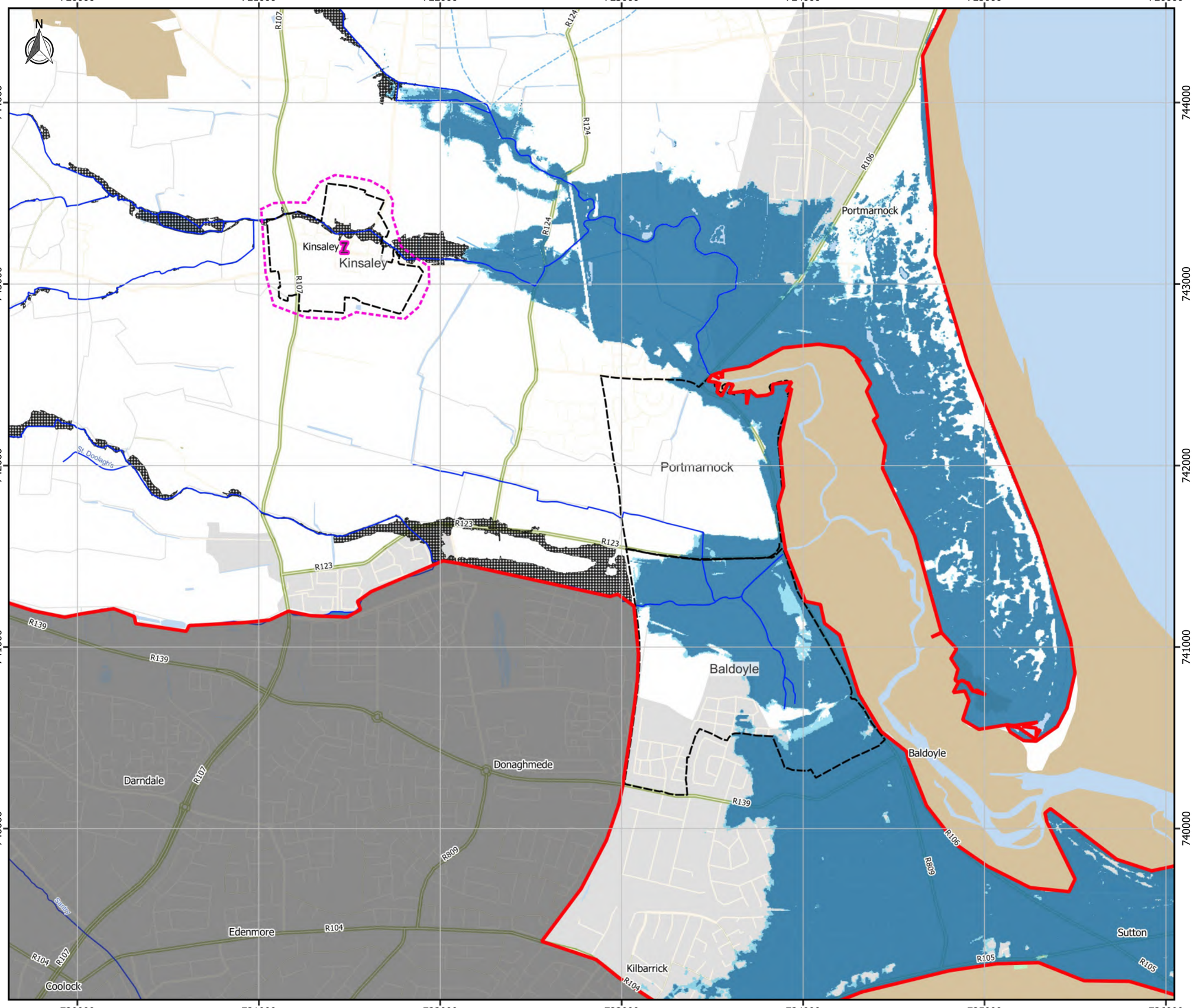
MAP: HIGH END FUTURE SCENARIO FLOOD EXTENT

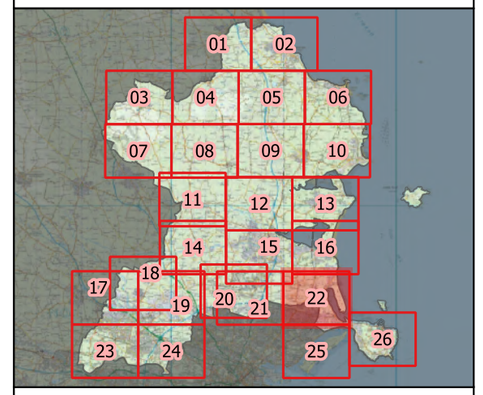
FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021
DRAWING NUMBER:		M02127-06_FIG_FL321
MAP SERIES:		PAGE 21 OF 26
DRAWING SCALE:		1:20000 @ A3



KEY PLAN



LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP HEFS Flood Extent
- 0.1% AEP HEFS Flood Extent
- No Climate Change Data Available; Present Day Flood Data Only.CC Flood Risk Subject to Site Specific Assessment
- Area for Further Consideration

REV:	NOTE:	DATE:
02	DRAFT ISSUE	01/12/2021

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MAP: HIGH END FUTURE SCENARIO FLOOD EXTENT

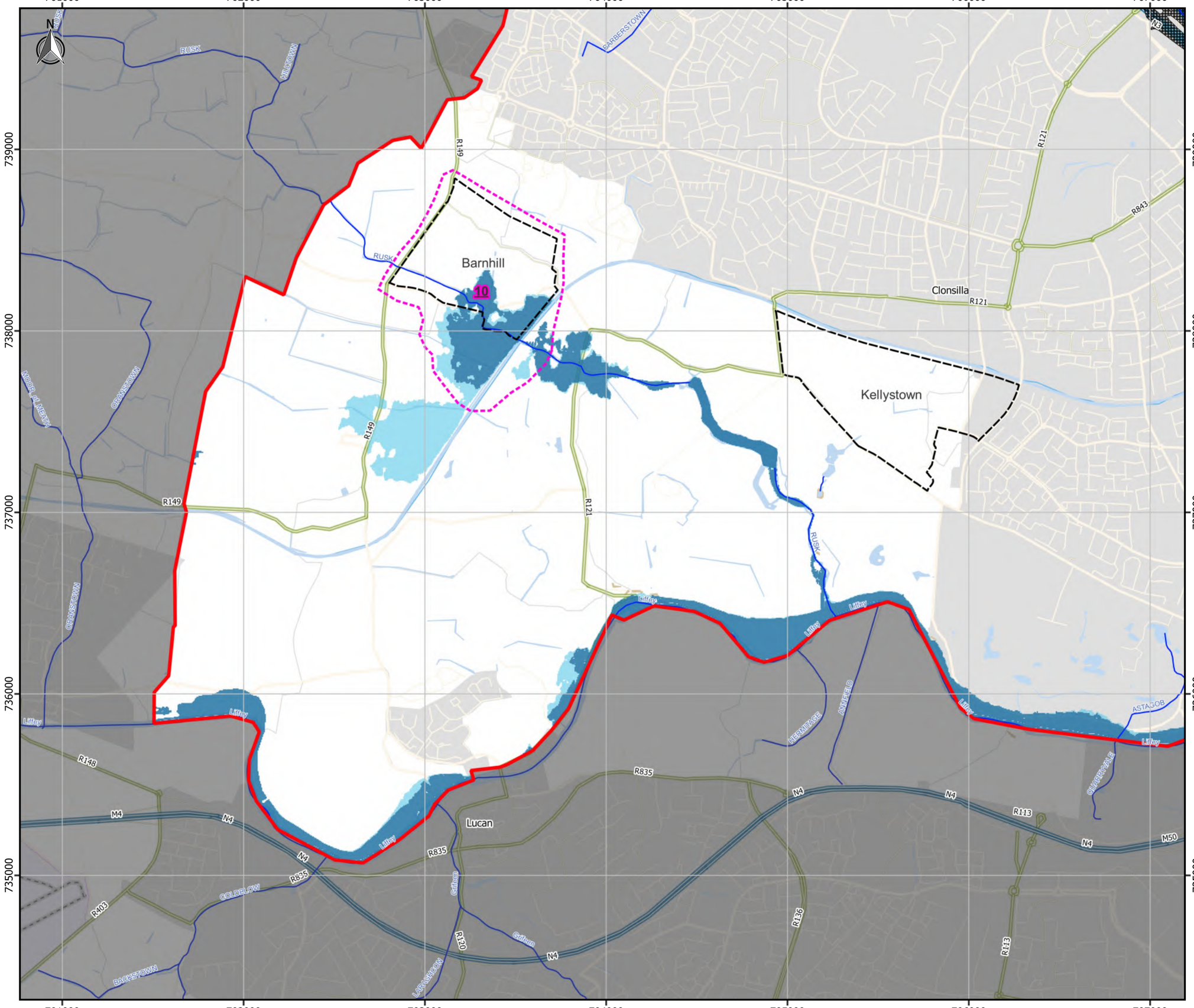
FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL322

MAP SERIES:	PAGE 22 OF 26
DRAWING SCALE:	1:20000 @ A3



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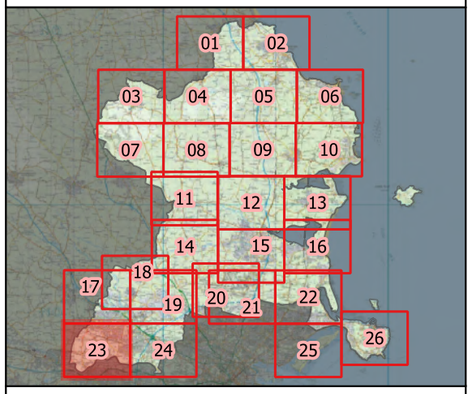

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP HEFS Flood Extent
- 0.1% AEP HEFS Flood Extent
- No Climate Change Data Available; Present Day Flood Data Only.CC Flood Risk Subject to Site Specific Assessment
- Area for Further Consideration

REV:	NOTE:	DATE:
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MAP: HIGH END FUTURE SCENARIO FLOOD EXTENT

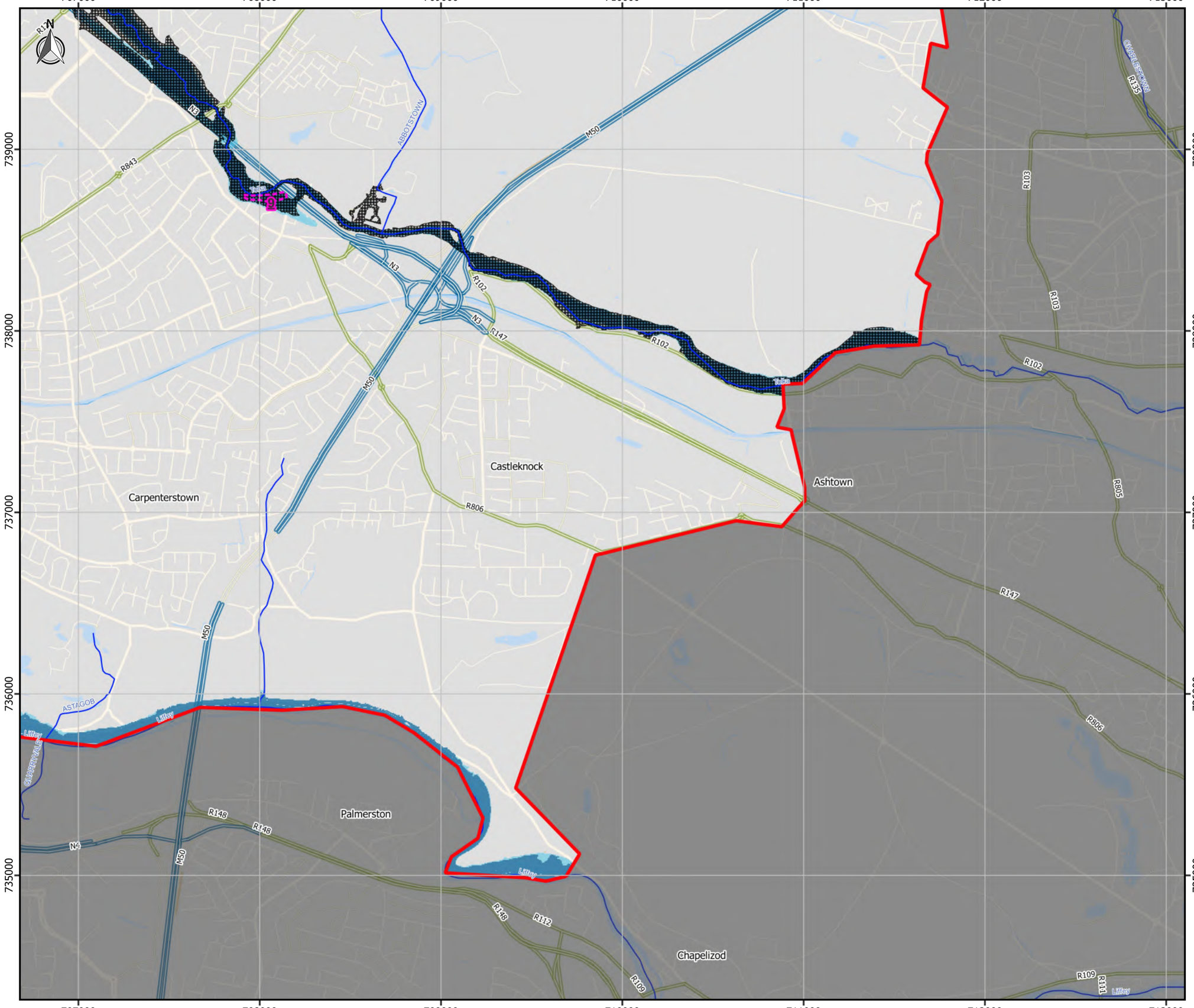
FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL323

MAP SERIES:	PAGE 23 OF 26
DRAWING SCALE:	1:20000 @ A3



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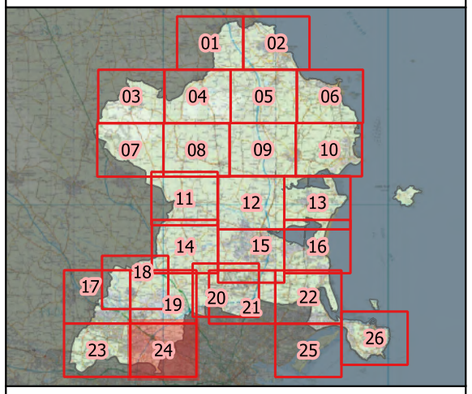

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP HEFS Flood Extent
- 0.1% AEP HEFS Flood Extent
- No Climate Change Data Available; Present Day Flood Data Only.CC Flood Risk Subject to Site Specific Assessment
- Area for Further Consideration

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MAP: HIGH END FUTURE SCENARIO FLOOD EXTENT

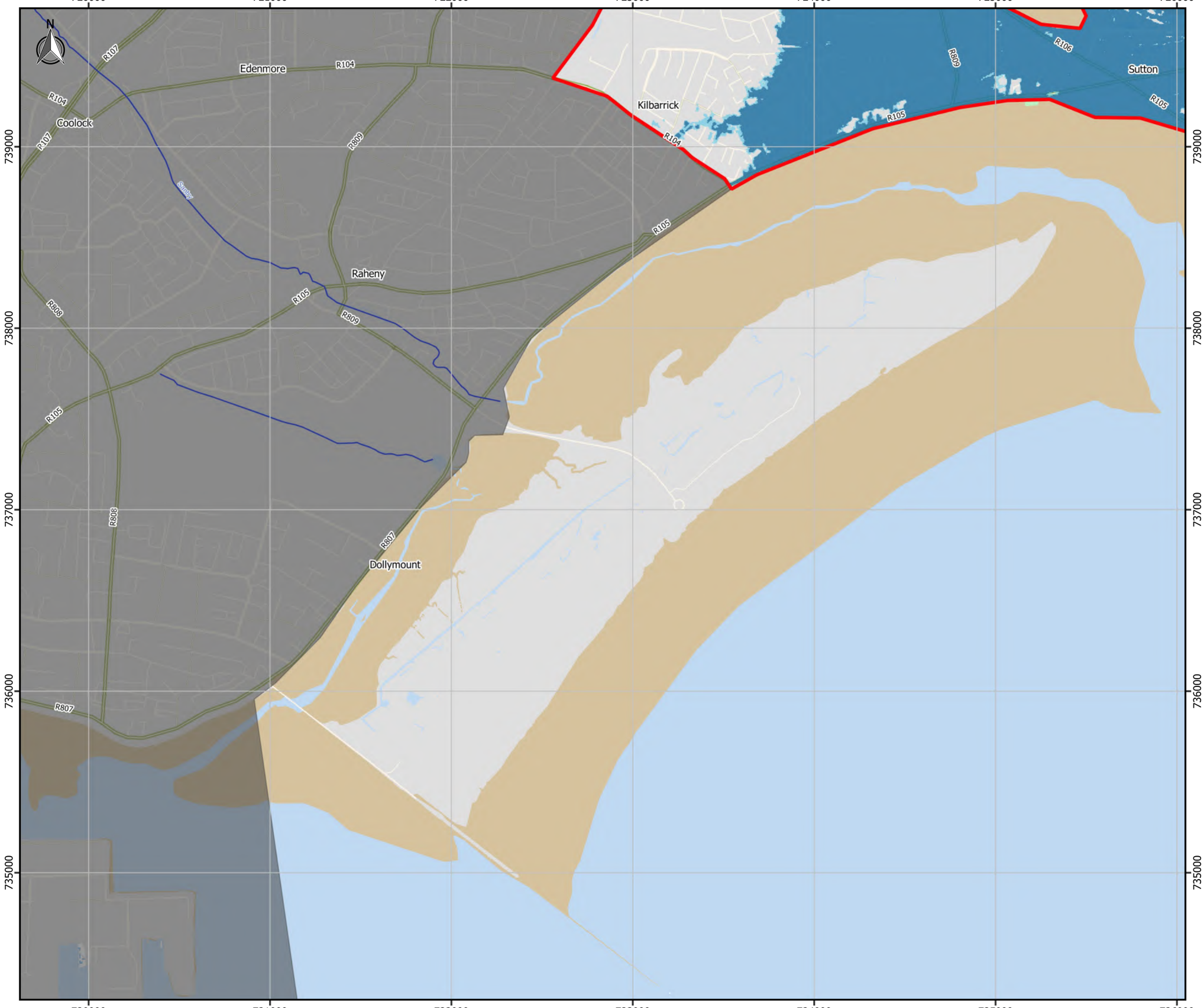
FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

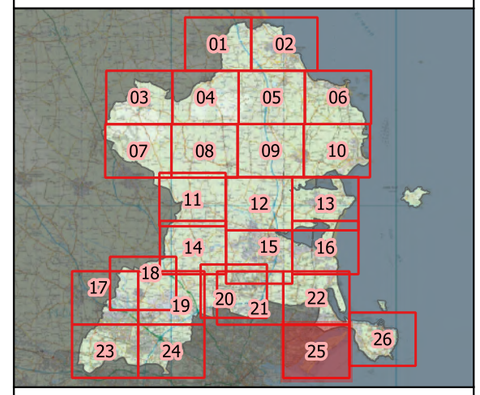
DRAWING NUMBER: M02127-06_FIG_FL324

MAP SERIES:	PAGE 24 OF 26
DRAWING SCALE:	1:20000 @ A3



0 0.5 1 km

KEY PLAN



LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP HEFS Flood Extent
- 0.1% AEP HEFS Flood Extent
- No Climate Change Data Available; Present Day Flood Data Only.CC Flood Risk Subject to Site Specific Assessment
- Area for Further Consideration

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MAP: HIGH END FUTURE SCENARIO FLOOD EXTENT

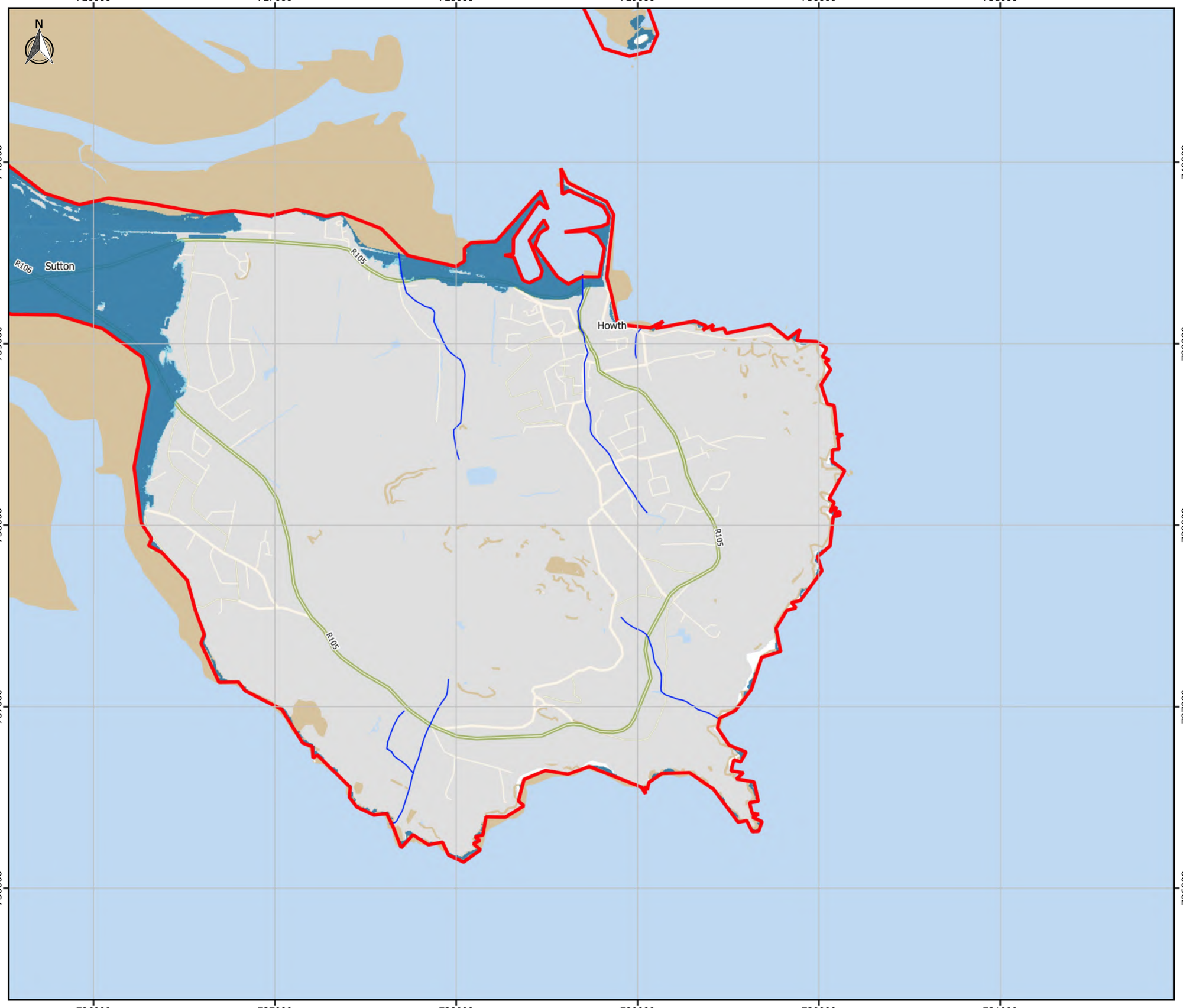
FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL325

MAP SERIES:	PAGE 25 OF 26
DRAWING SCALE:	1:20000 @ A3



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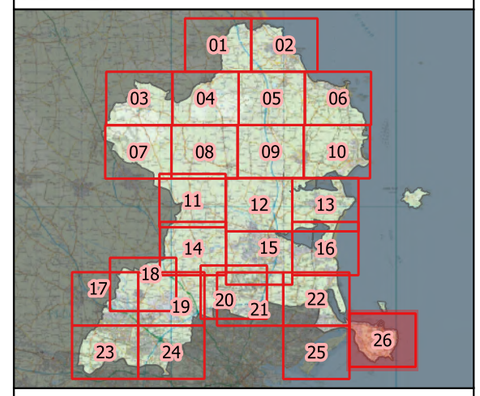

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP HEFS Flood Extent
- 0.1% AEP HEFS Flood Extent
- No Climate Change Data Available; Present Day Flood Data Only.CC Flood Risk Subject to Site Specific Assessment
- Area for Further Consideration

REV:	NOTE:	DATE:
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MAP: HIGH END FUTURE SCENARIO FLOOD EXTENT

FLOOD PROBABILITY:

FLUVIAL: 1% / 0.1% COASTAL: 0.5% / 0.1%

SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 01/12/2021
CHECKED BY:	PS	DATE: 01/12/2021
APPROVED BY:	DKS	DATE: 01/12/2021

DRAWING NUMBER: M02127-06_FIG_FL326

MAP SERIES:	PAGE 26 OF 26
DRAWING SCALE:	1:20000 @ A3

Appendix D

Flood Zone Data Source Maps

LEGEND

Fingal County Administrative Boundary

Overview Map Page Number Reference

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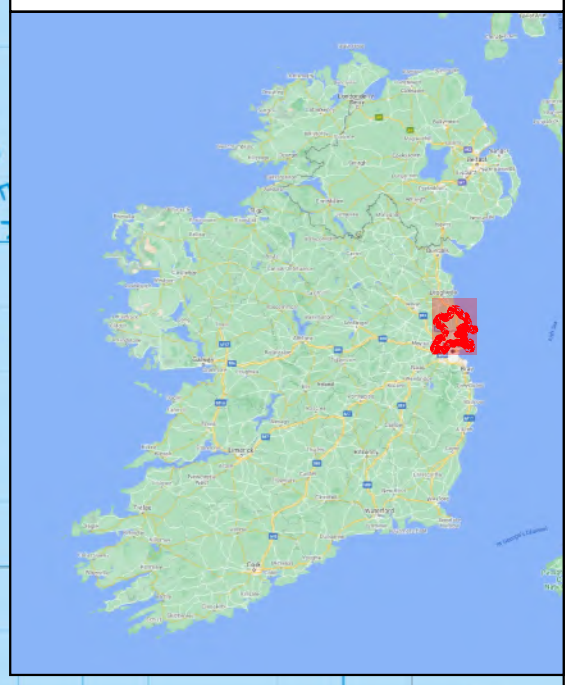

N

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

BALBRIGGAN Baile Brigín

SKERRIES Na Sceirí

Lambay Island

IRISH SEA Muir Éireann

DUBLIN

701000 711000 721000 731000

765000 755000 745000 735000

0 2.5 5 km

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MAP: SFRA FLOOD MAP OVERVIEW / LOCATION PLAN			**SOURCE CRS:**	ITM EPSG:2157	**DRAWN BY:**	DL	DATE: 10/11/2021
DRAWING NUMBER: M02127-06_FIG_FL100			**DRAWING SCALE:**	AS SHOWN @ A3	**CHECKED BY:**	PS	DATE: 10/11/2021
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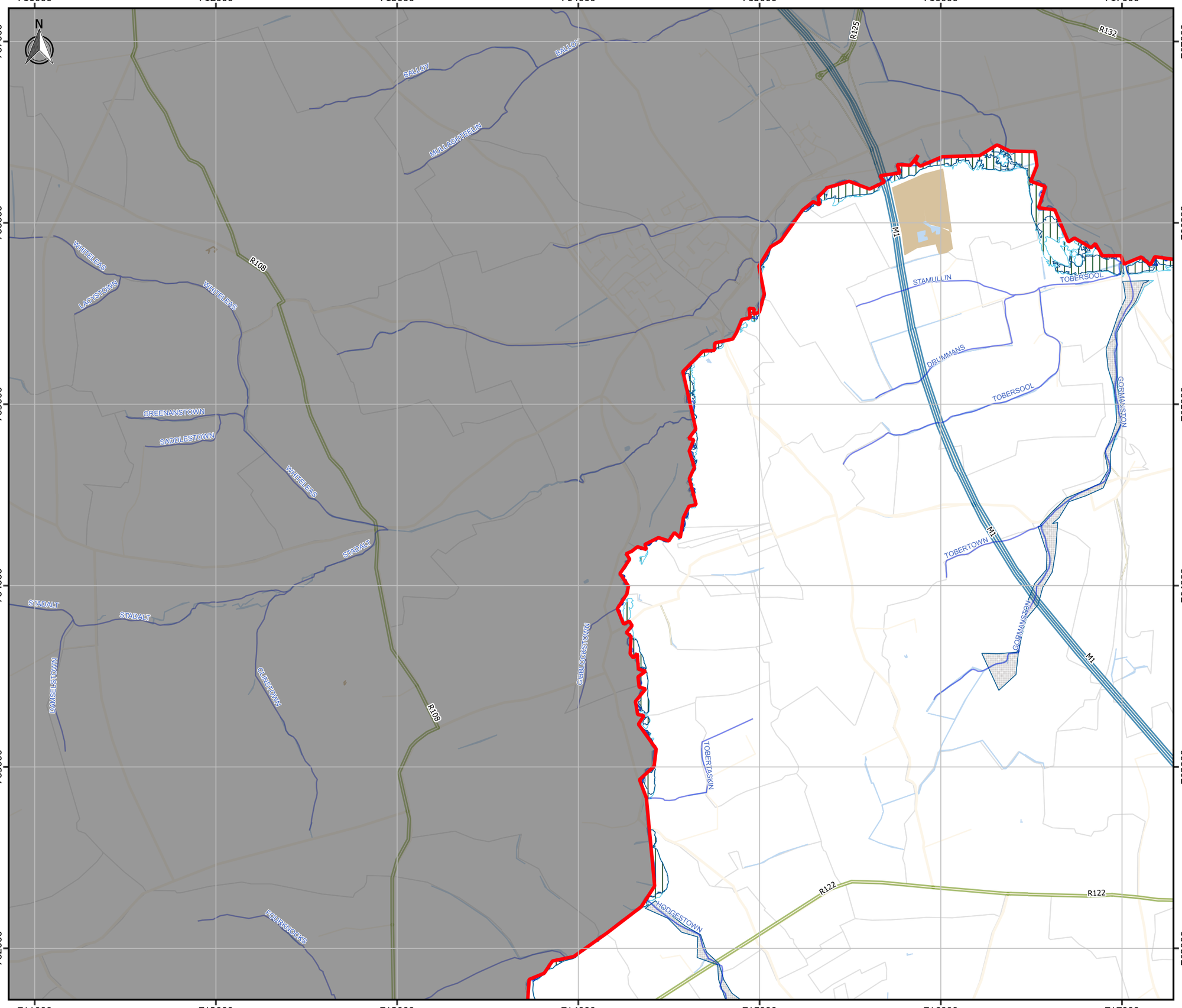

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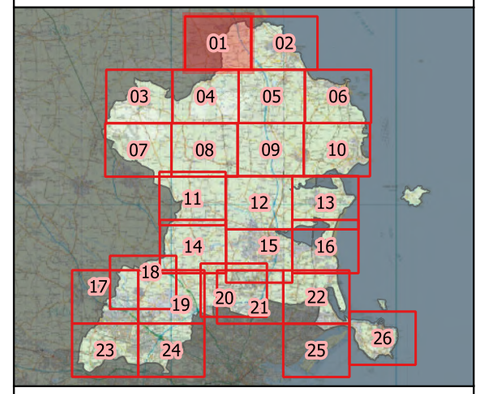

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
- CFRAM / FEMFRAMS
- National Indicative Fluvial Mapping (NIFM)
- National Coastal Flood Hazard Mapping (NCFHM)
- PFRA

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MAP:	FLOOD DATA SOURCE	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
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CHECKED BY:	PS	DATE: 22/02/2022
APPROVED BY:	DKS	DATE: 22/02/2022
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MAP SERIES:		PAGE 01 OF 26
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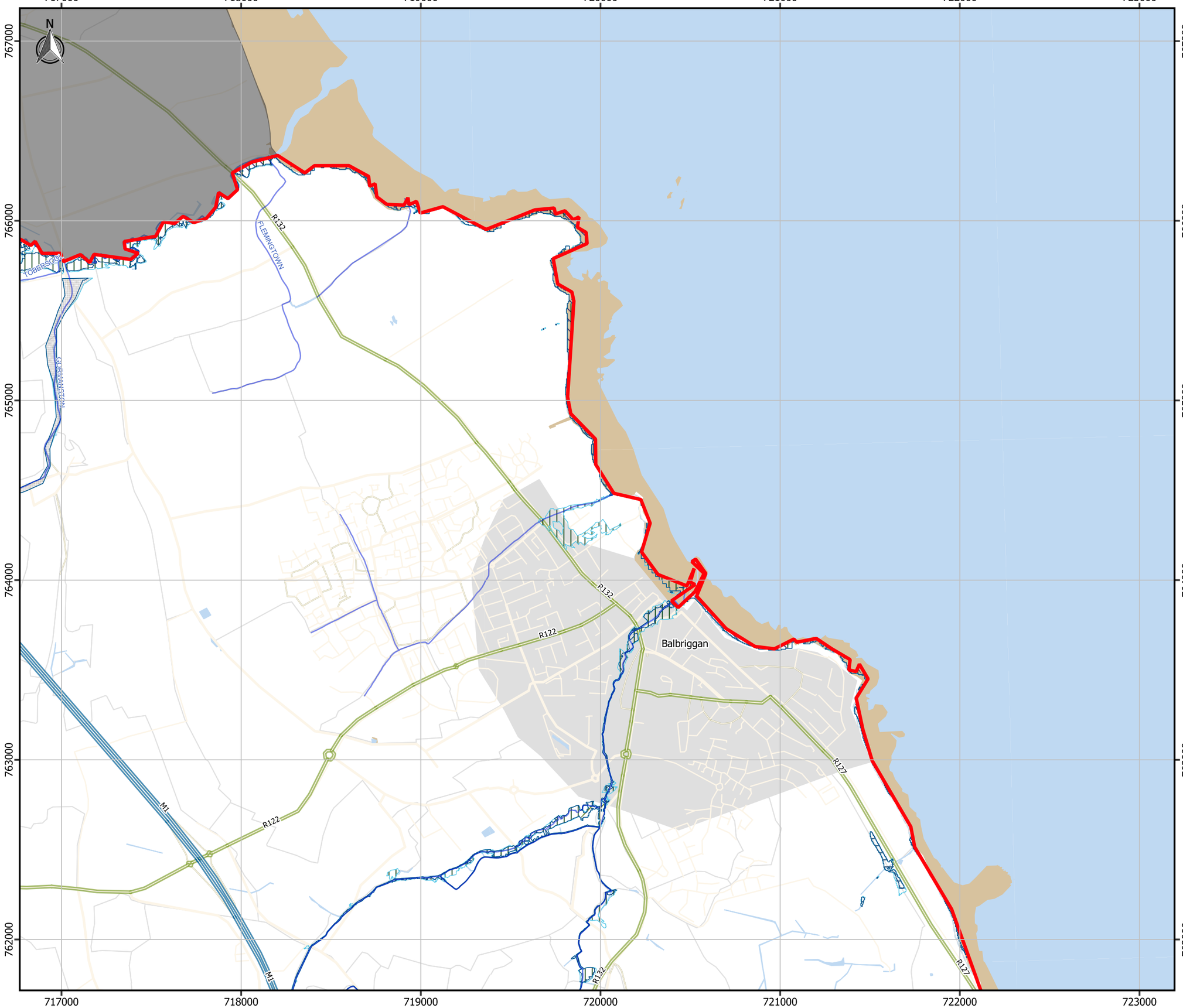

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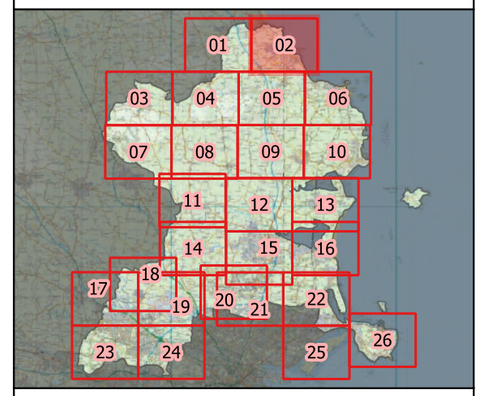

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
- CFRAM / FEMFRAMS
- National Indicative Fluvial Mapping (NIFM)
- National Coastal Flood Hazard Mapping (NCFHM)
- PFRA

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MAP:	FLOOD DATA SOURCE	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
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CHECKED BY:	PS	DATE: 22/02/2022
APPROVED BY:	DKS	DATE: 22/02/2022
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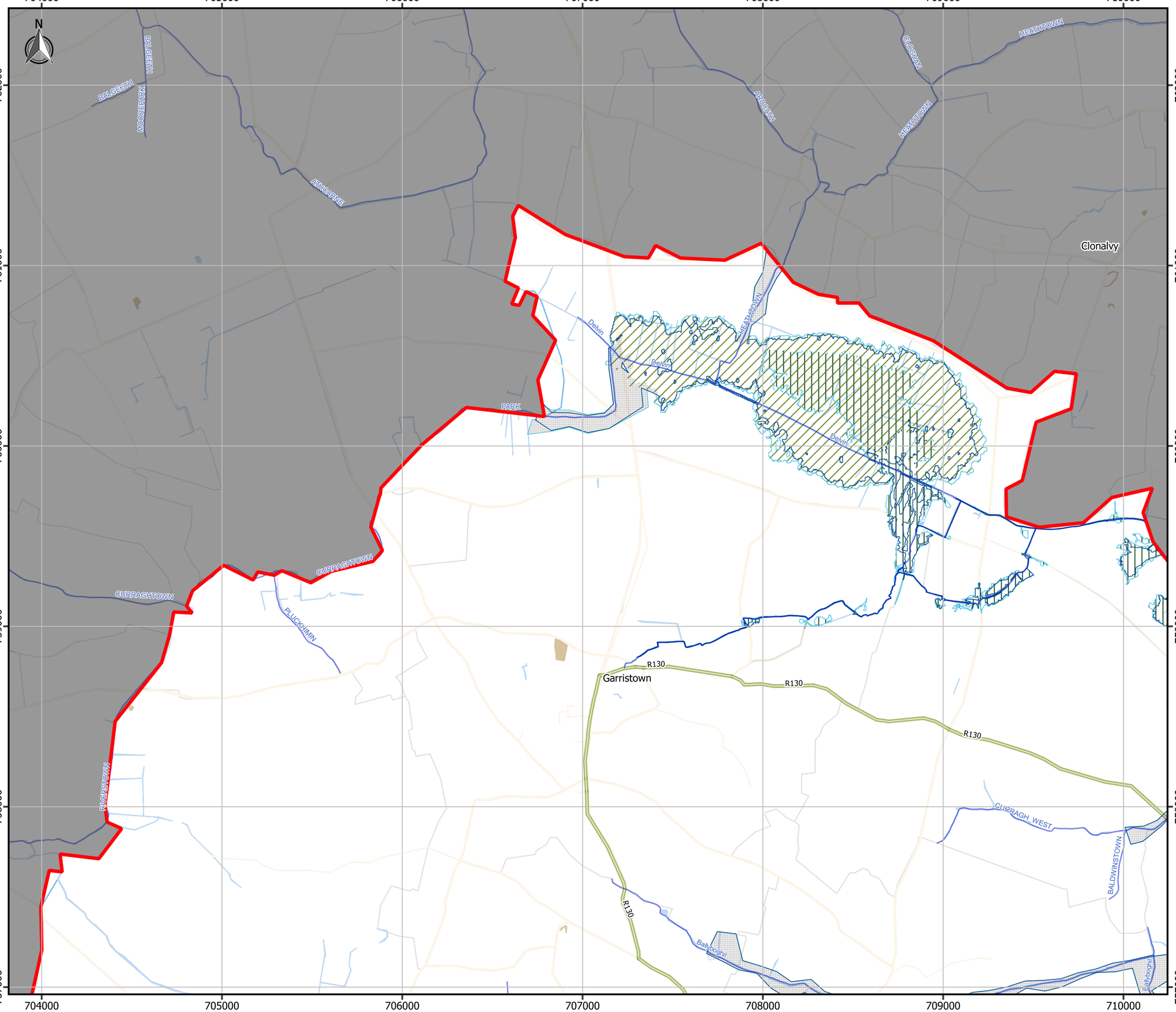
MAP SERIES:		PAGE 02 OF 26
DRAWING SCALE:		1:20000 @ A3



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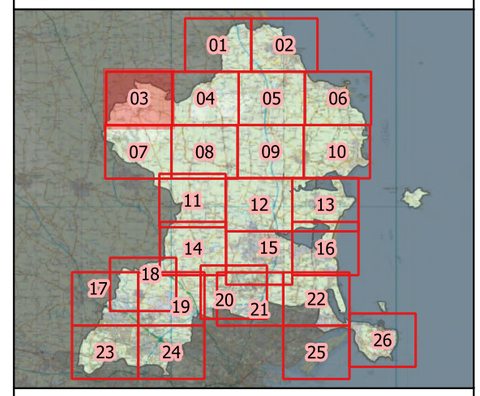

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
- CFRAM / FEMFRAMS
- National Indicative Fluvial Mapping (NIFM)
- National Coastal Flood Hazard Mapping (NCFHM)
- PFRA

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MAP:	FLOOD DATA SOURCE	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
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APPROVED BY:	DKS	DATE: 22/02/2022
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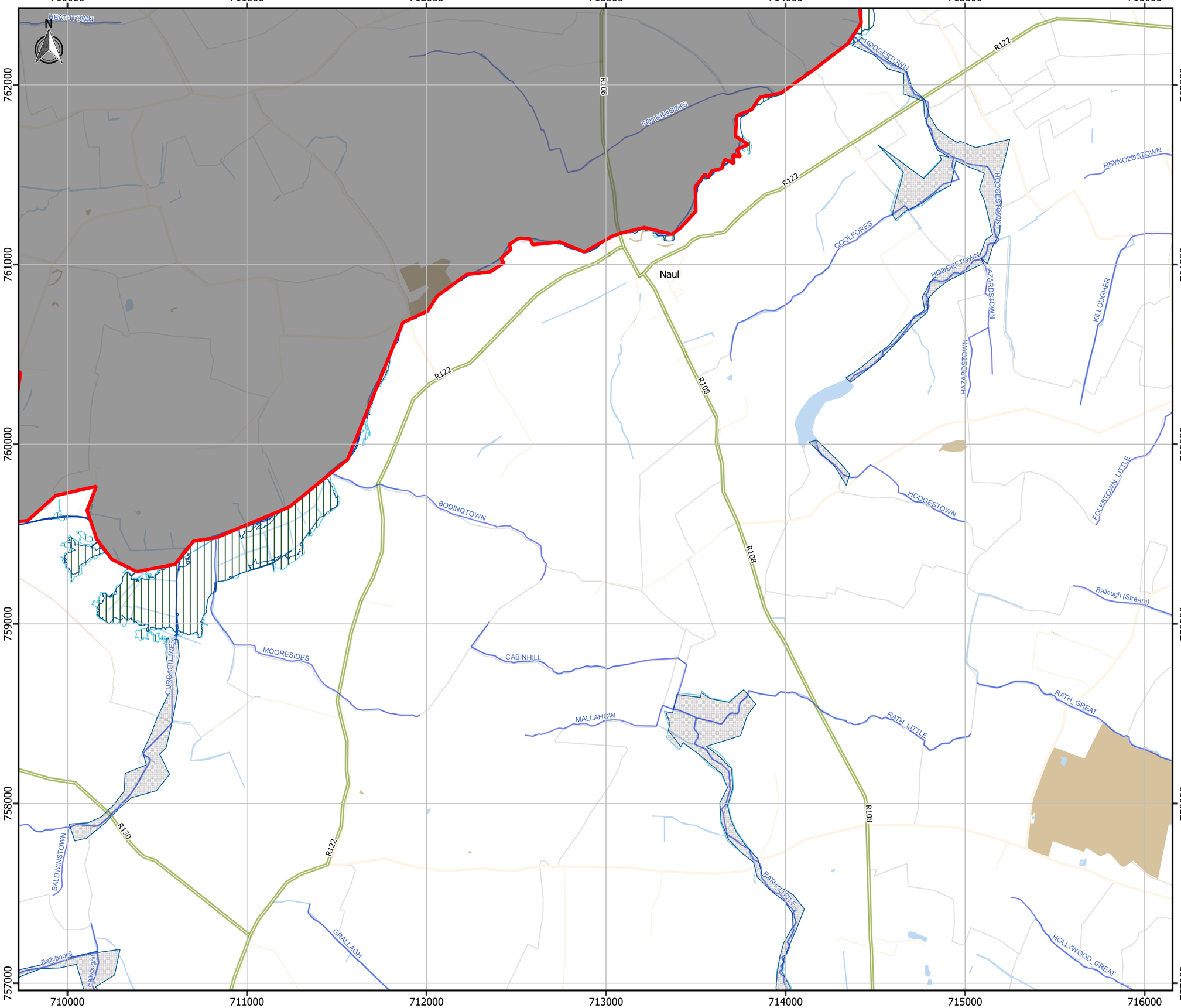
MAP SERIES:		PAGE 03 OF 26
DRAWING SCALE:		1:20000 @ A3



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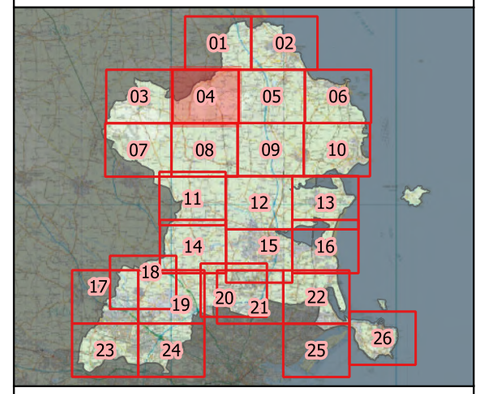

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
- CFRAM / FEMFRAMS
- National Indicative Fluvial Mapping (NIFM)
- National Coastal Flood Hazard Mapping (NCFHM)
- PFRA

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MAP:	FLOOD DATA SOURCE	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
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APPROVED BY:	DKS	DATE: 22/02/2022
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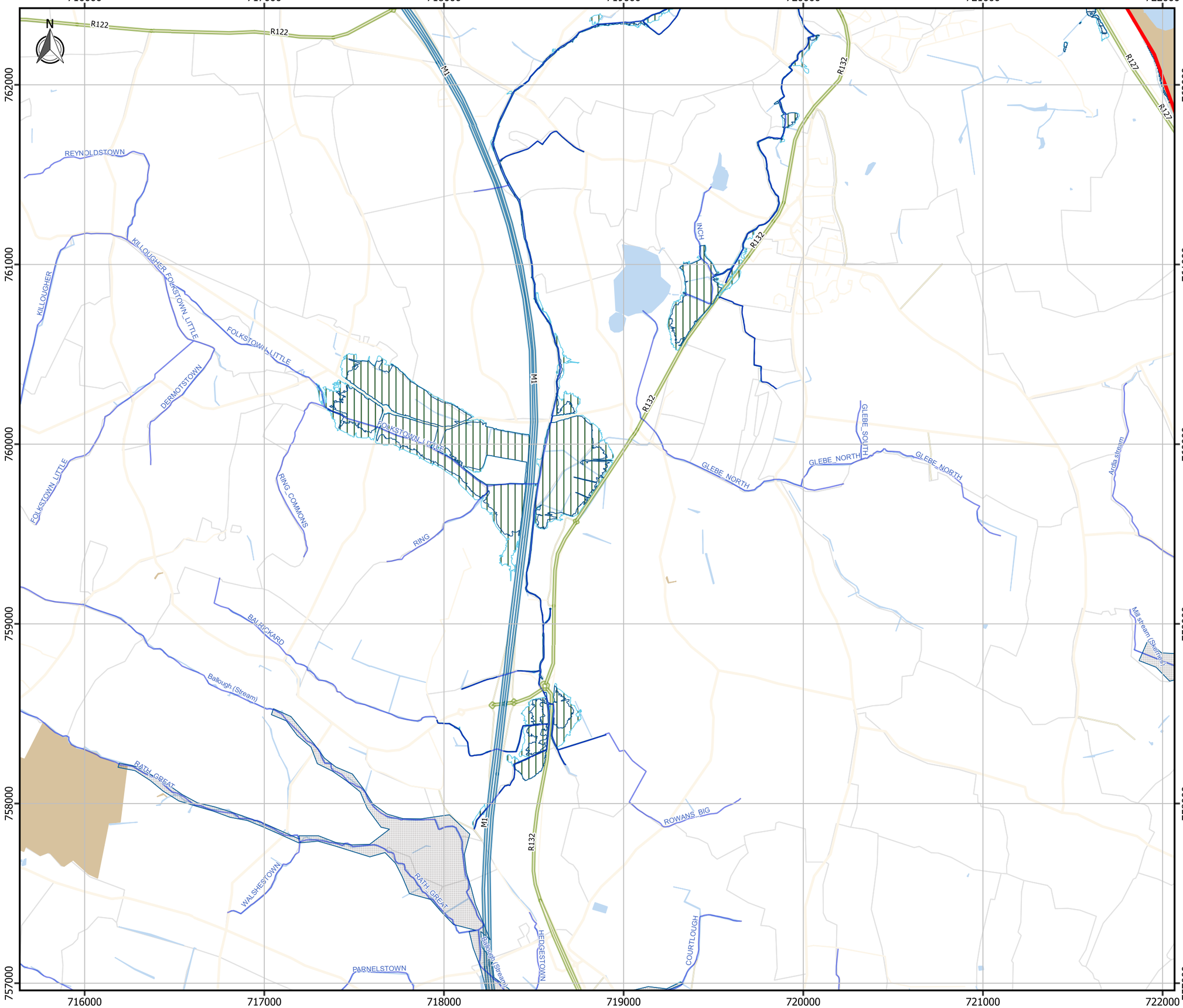
MAP SERIES:		PAGE 04 OF 26
DRAWING SCALE:		1:20000 @ A3



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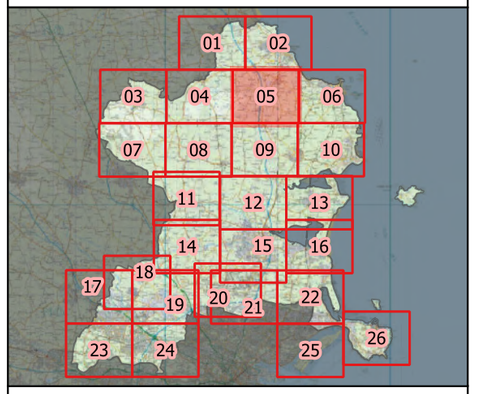

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
- CFRAM / FEMFRAMS
- National Indicative Fluvial Mapping (NIFM)
- National Coastal Flood Hazard Mapping (NCFHM)
- PFRA

REV:	NOTE:	DATE:
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MAP:	FLOOD DATA SOURCE	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
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DRAWING NUMBER:	M02127-06_FIG_FL405	
MAP SERIES:		PAGE 05 OF 26
DRAWING SCALE:		1:20000 @ A3

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762000 761000 760000 759000 758000 757000

N

R127

Skerries

MARGARETSTOWN

Ardla stream

Mill stream (Skerries)

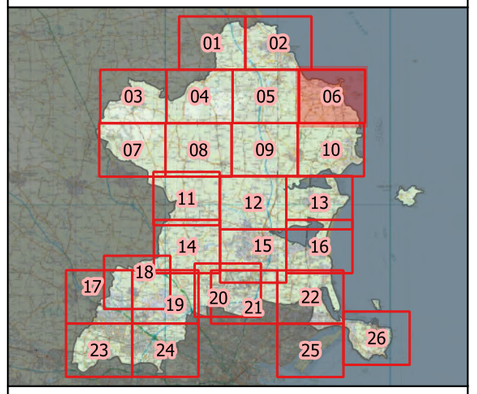
MILVERTON

R128

BALCUNNIN

0 0.5 1 km

KEY PLAN



LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
- CFRAM / FEMFRAMS
- National Indicative Fluvial Mapping (NIFM)
- National Coastal Flood Hazard Mapping (NCFHM)
- PFRA

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MAP:	FLOOD DATA SOURCE	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
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APPROVED BY:	DKS	DATE: 22/02/2022
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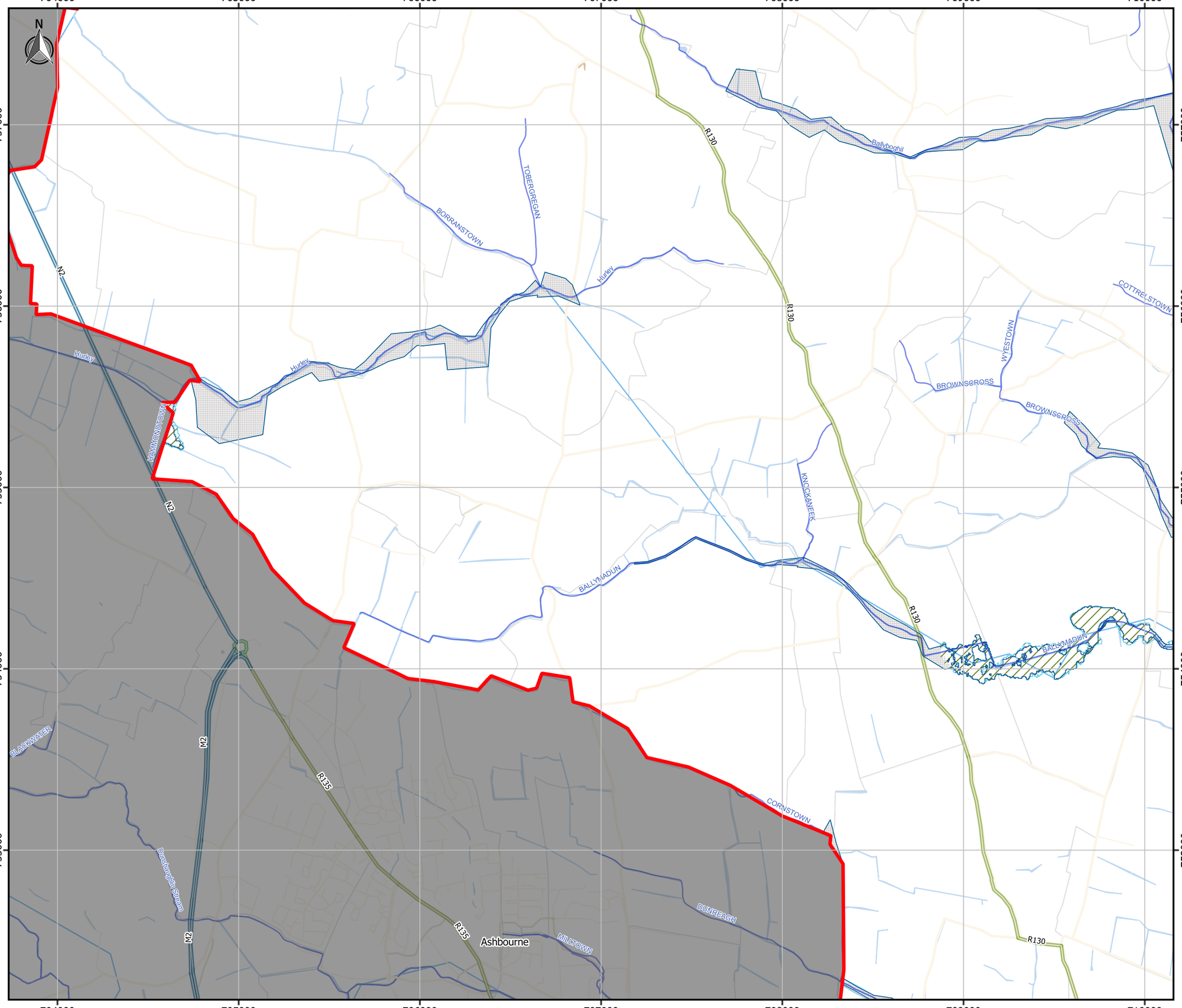

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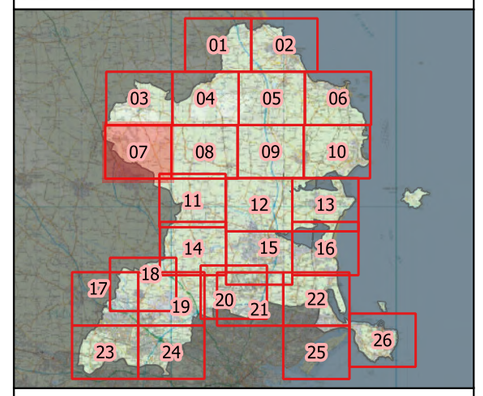

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
- CFRAM / FEMFRAMS
- National Indicative Fluvial Mapping (NIFM)
- National Coastal Flood Hazard Mapping (NCFHM)
- PFRA

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MAP:	FLOOD DATA SOURCE	
FLOOD PROBABILITY:	FLUVIAL: 1% / 0.1%	COASTAL: 0.5% / 0.1%
SOURCE CRS:		ITM EPSG:2157
DRAWN BY:	DL	DATE: 22/02/2022
CHECKED BY:	PS	DATE: 22/02/2022
APPROVED BY:	DKS	DATE: 22/02/2022
DRAWING NUMBER:	M02127-06_FIG_FL407	
MAP SERIES:		PAGE 07 OF 26
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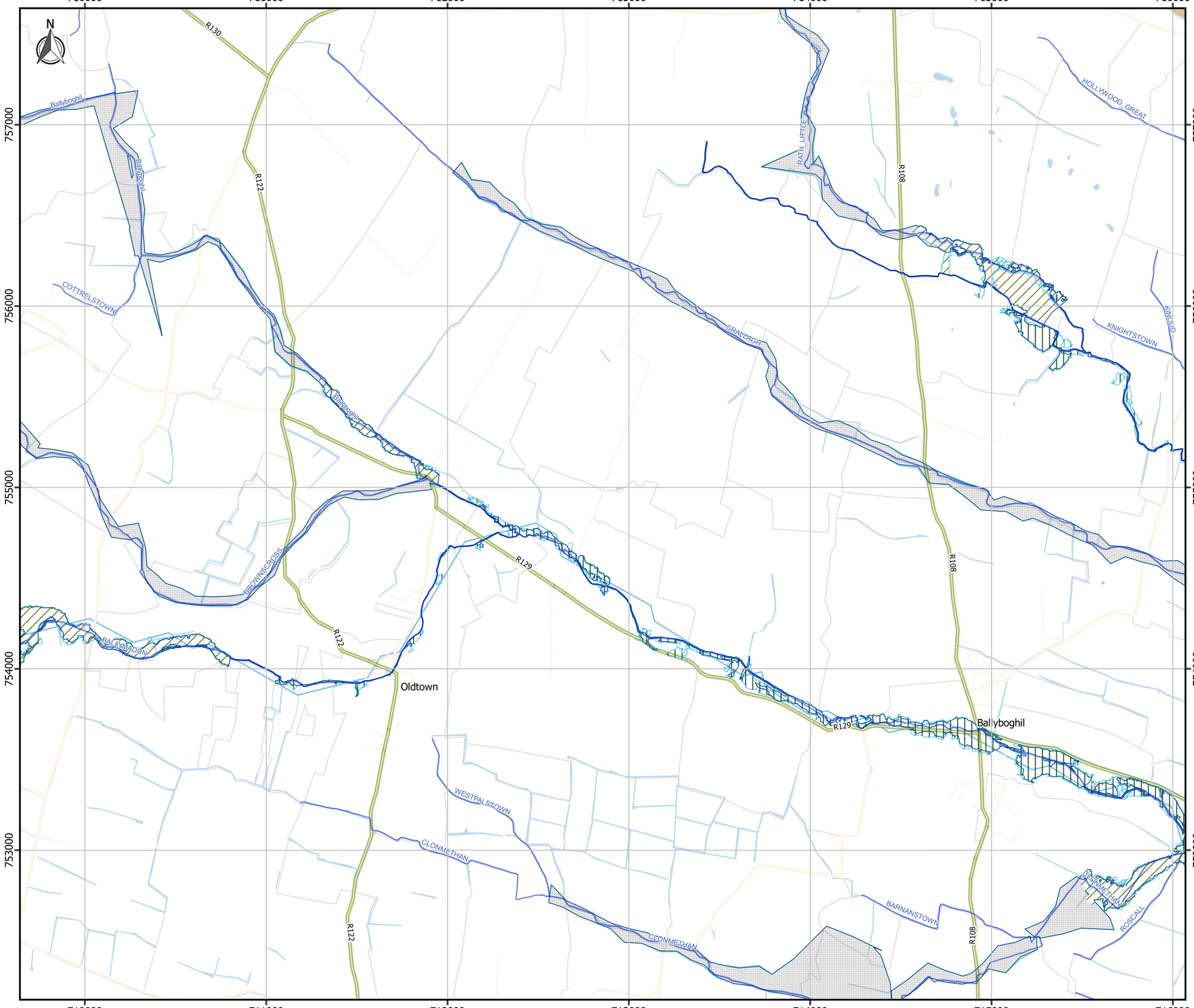

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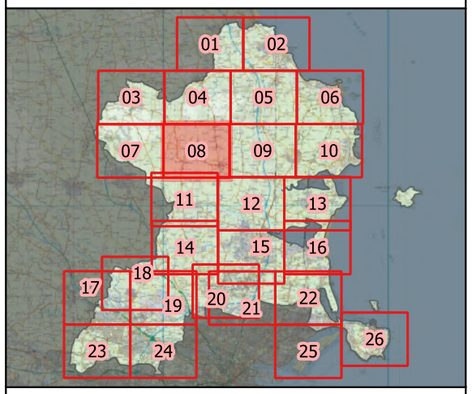

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
- CFRAM / FEMFRAMS
- National Indicative Fluvial Mapping (NIFM)
- National Coastal Flood Hazard Mapping (NCFHM)
- PFRA

REV:	NOTE:	DATE:
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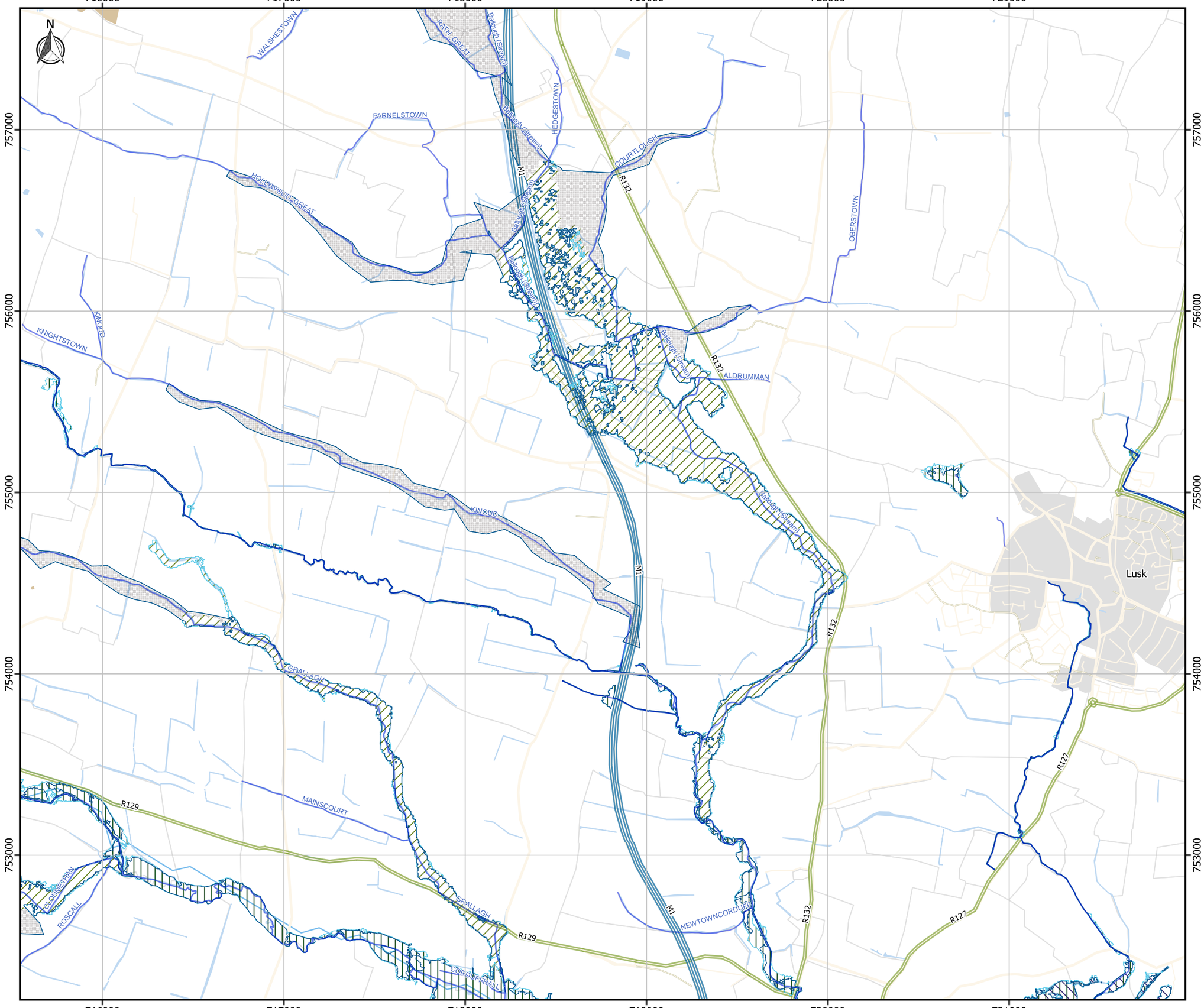

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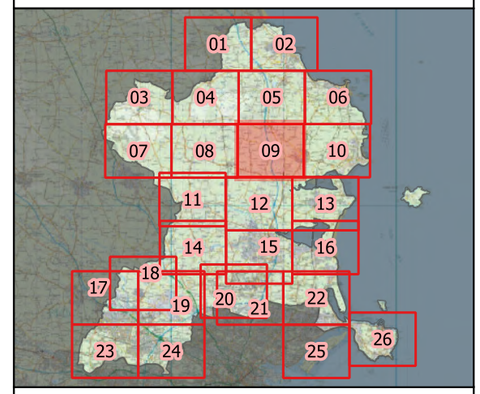

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
- CFRAM / FEMFRAMS
- National Indicative Fluvial Mapping (NIFM)
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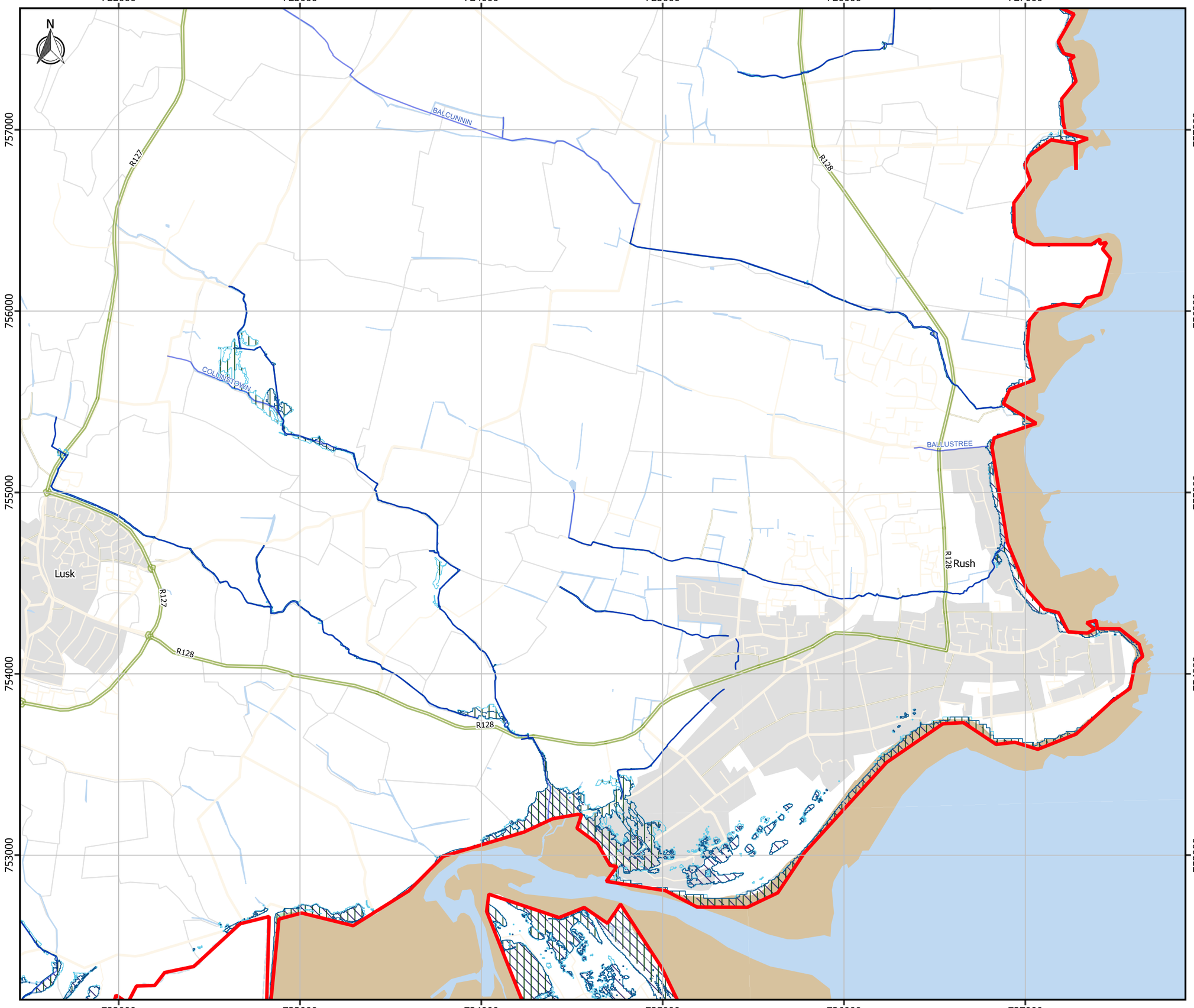

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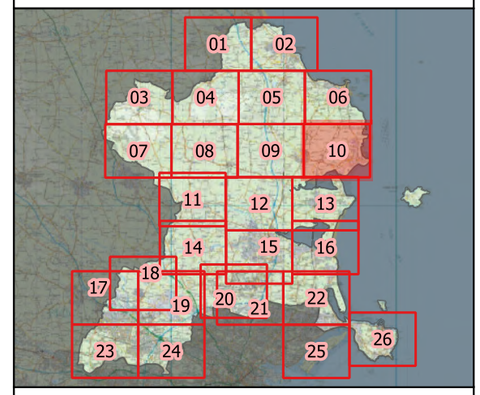

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
- CFRAM / FEMFRAMS
- National Indicative Fluvial Mapping (NIFM)
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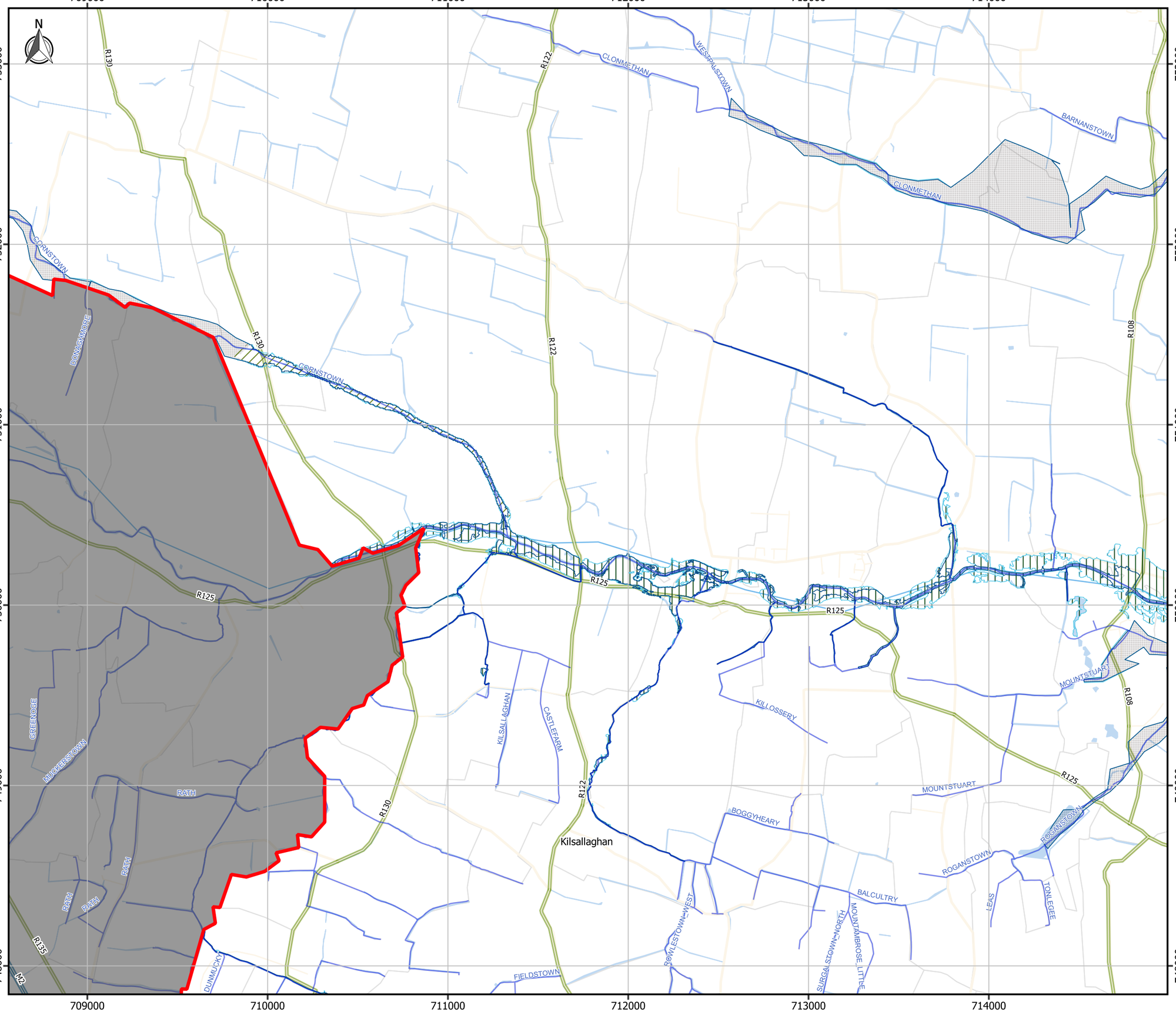

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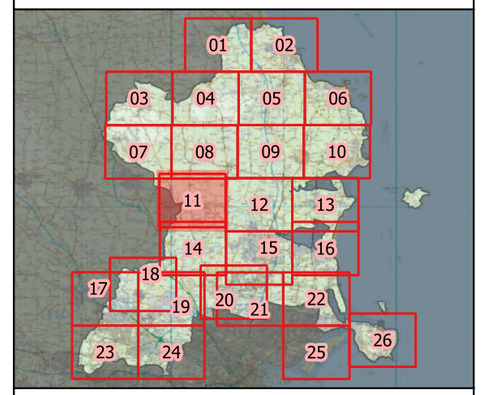

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
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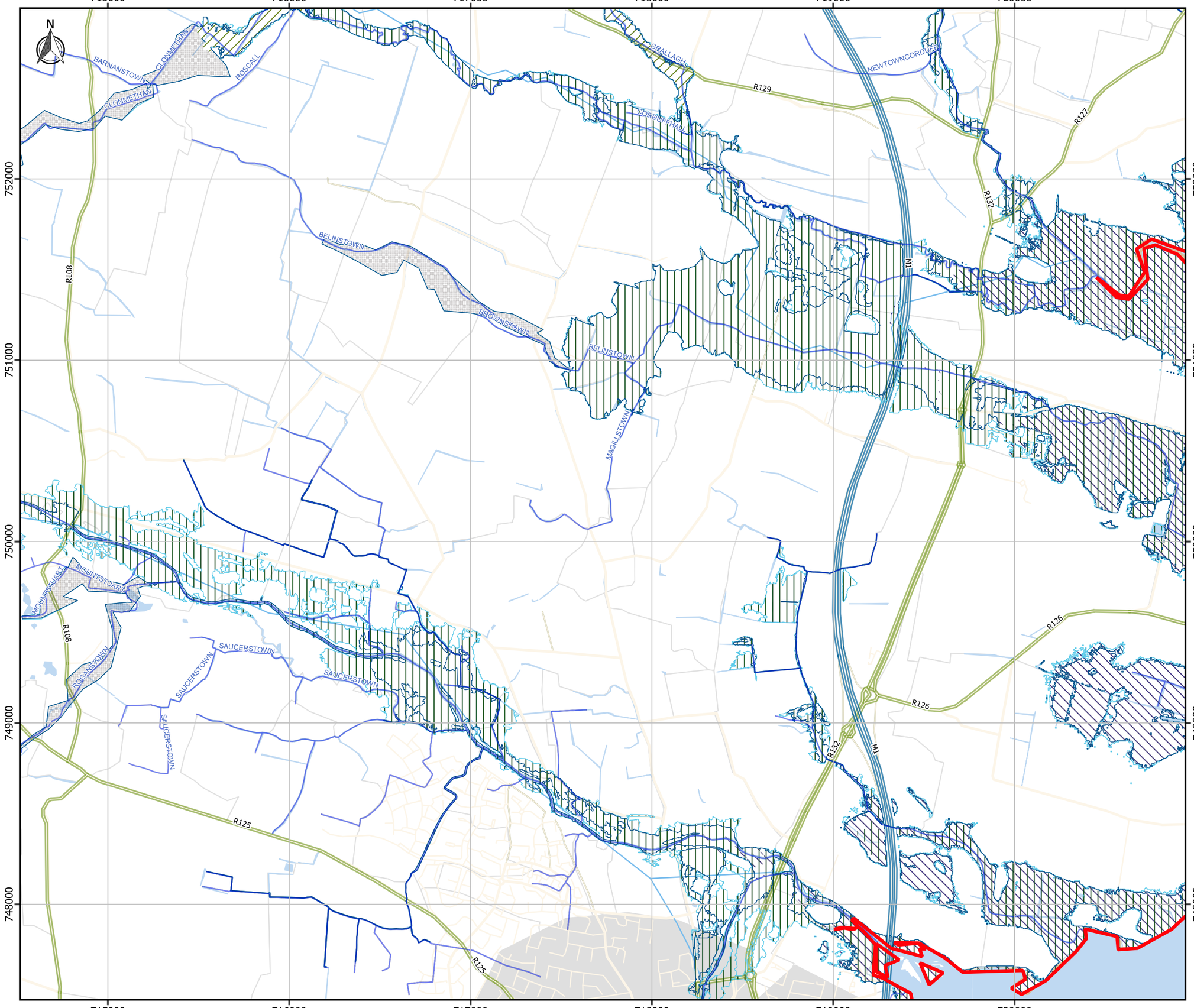

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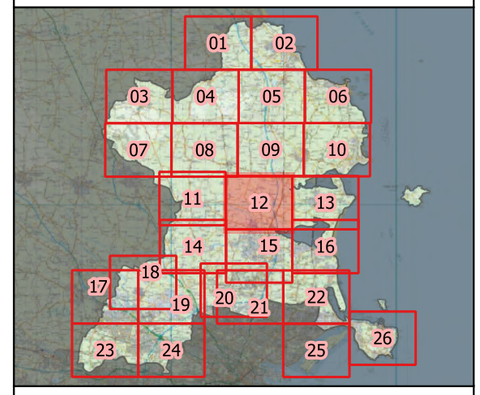

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
- CFRAM / FEMFRAMS
- National Indicative Fluvial Mapping (NIFM)
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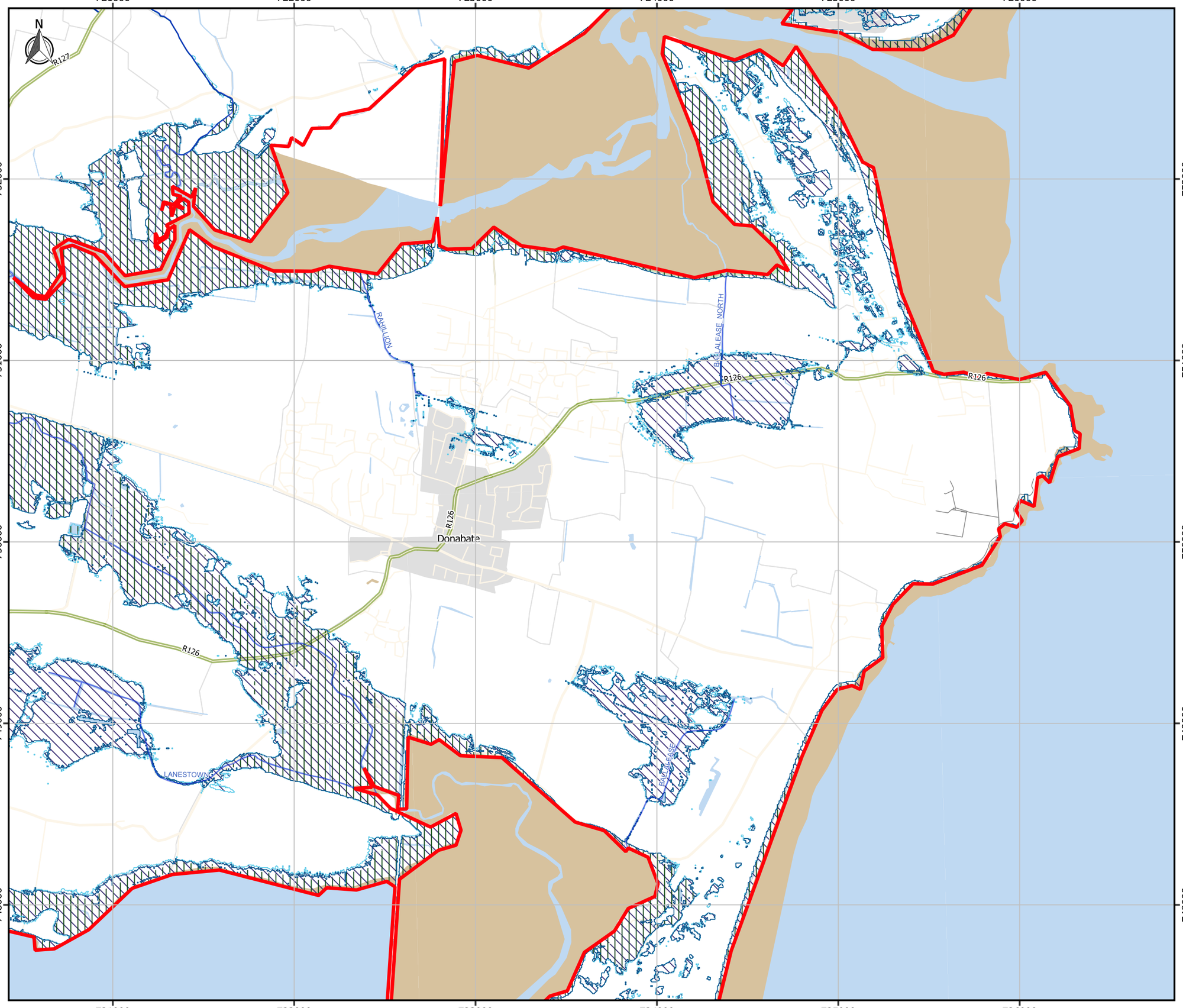

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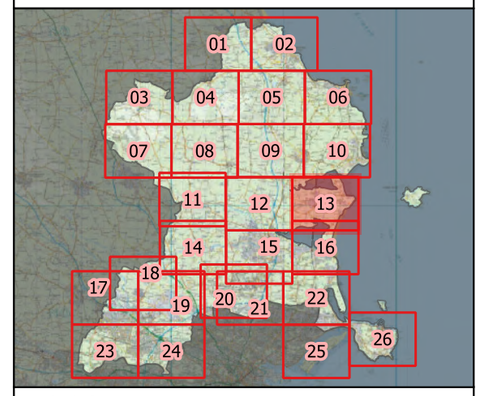

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
- CFRAM / FEMFRAMS
- National Indicative Fluvial Mapping (NIFM)
- National Coastal Flood Hazard Mapping (NCFHM)
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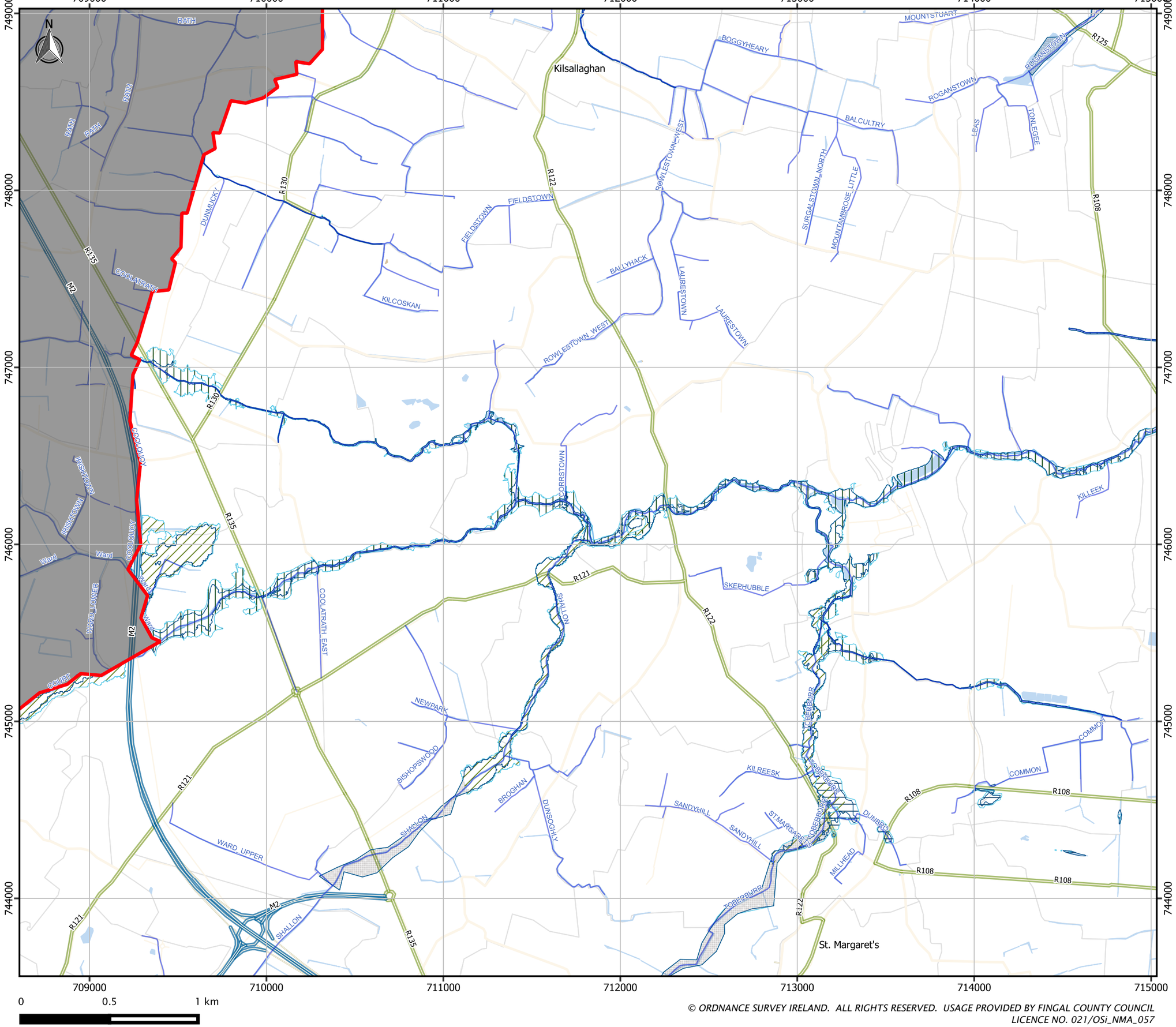

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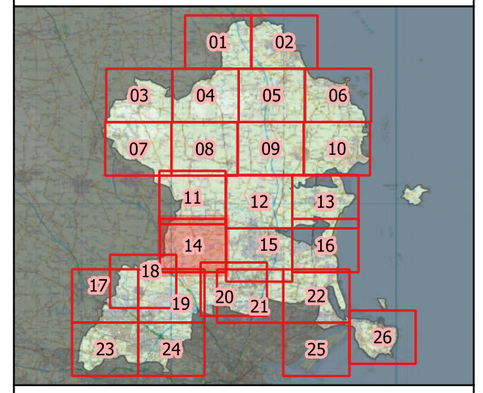

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
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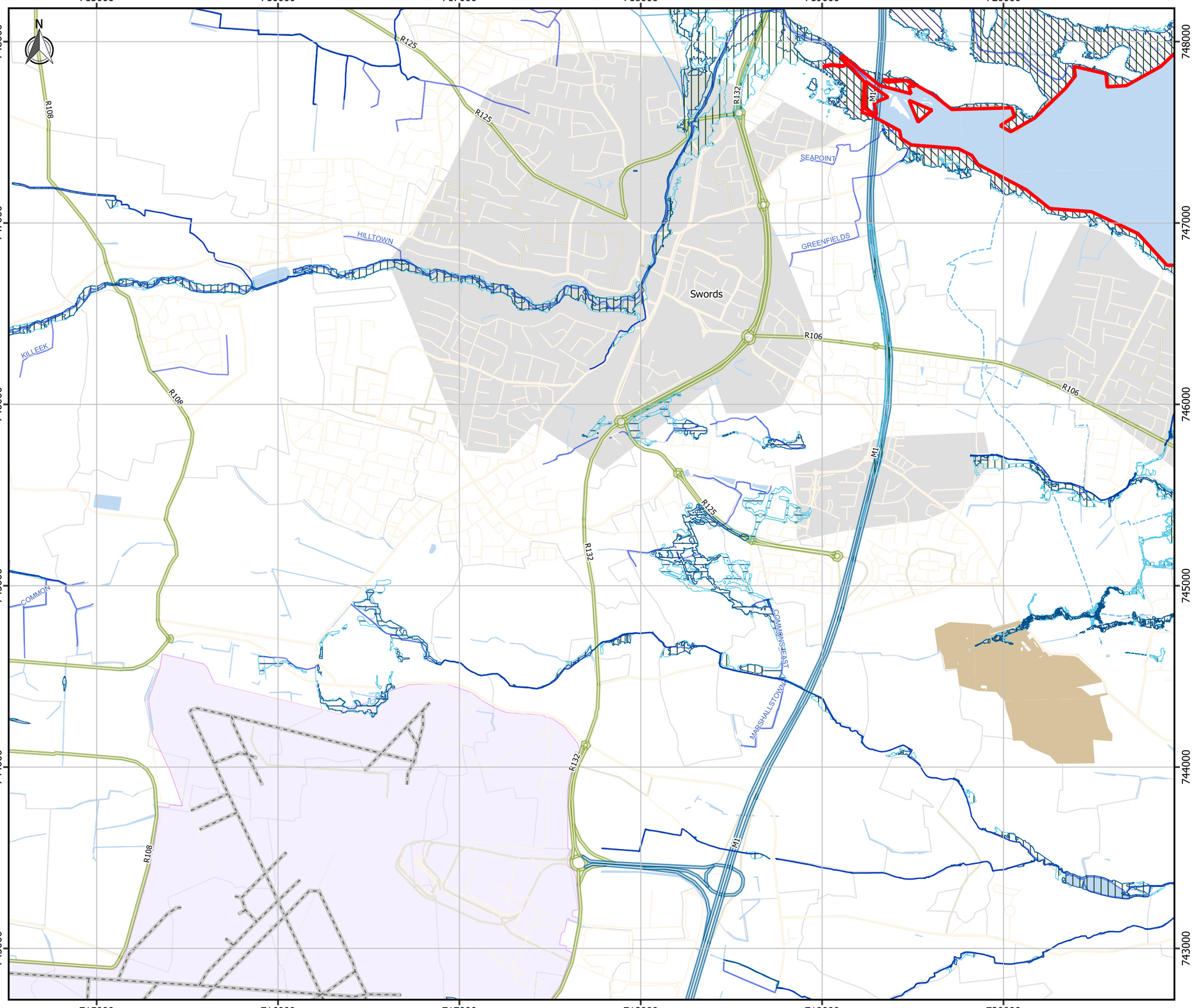

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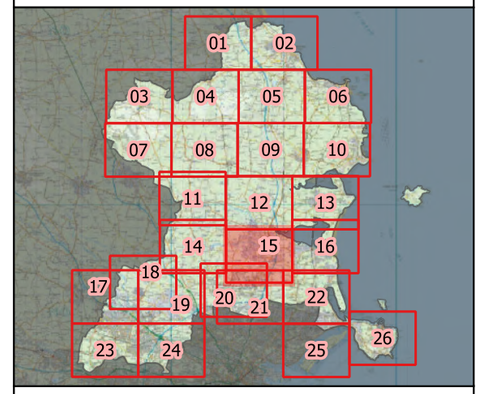

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
- CFRAM / FEMFRAMS
- National Indicative Fluvial Mapping (NIFM)
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DRAWING NUMBER:	M02127-06_FIG_FL415	
MAP SERIES:		PAGE 15 OF 26
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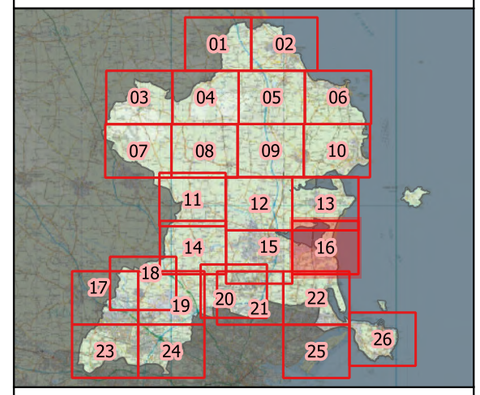

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
- CFRAM / FEMFRAMS
- National Indicative Fluvial Mapping (NIFM)
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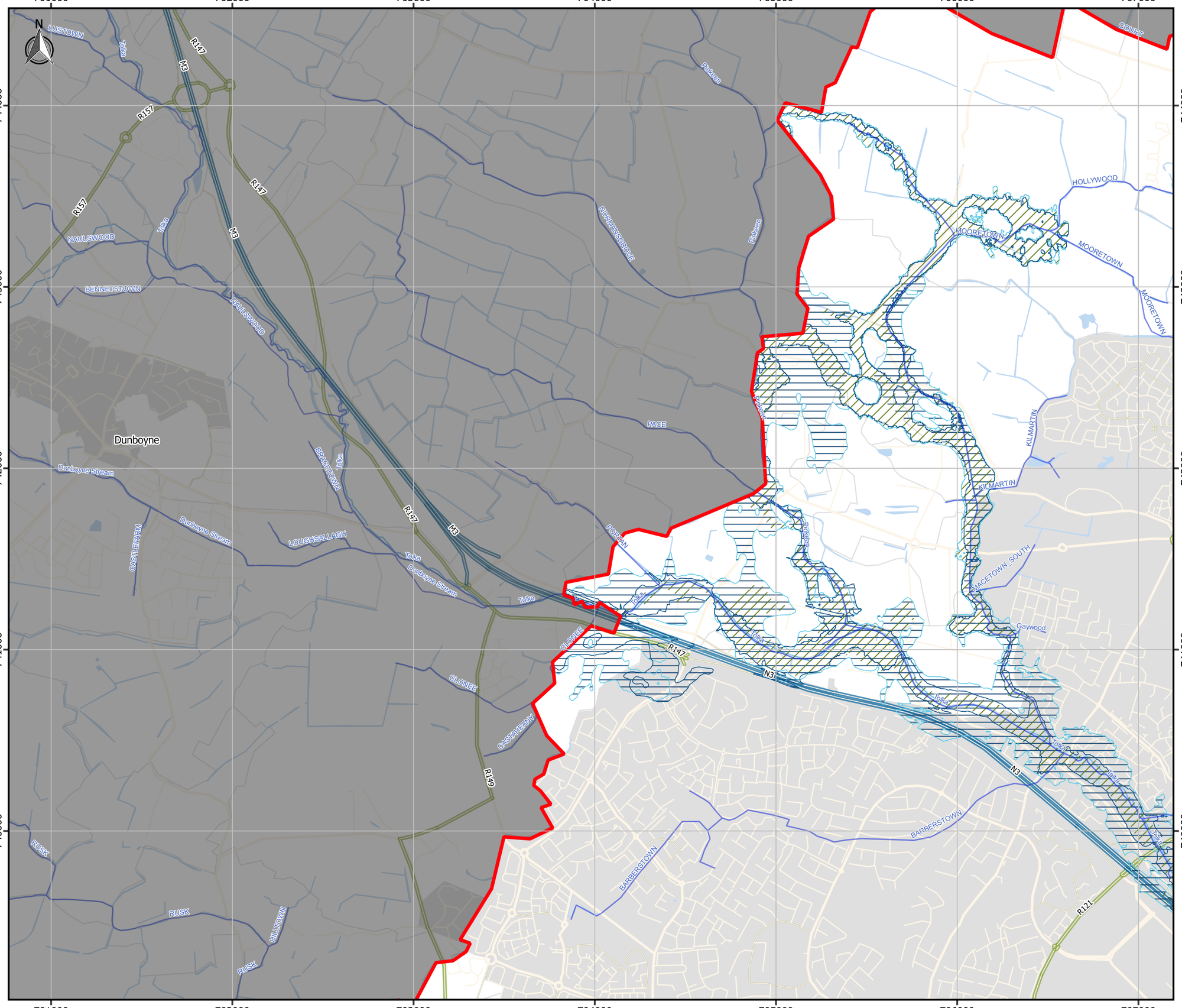

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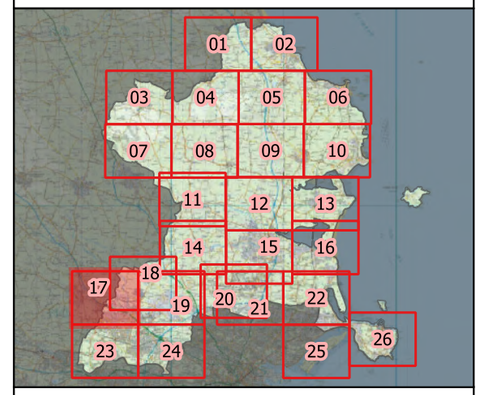

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
- CFRAM / FEMFRAMS
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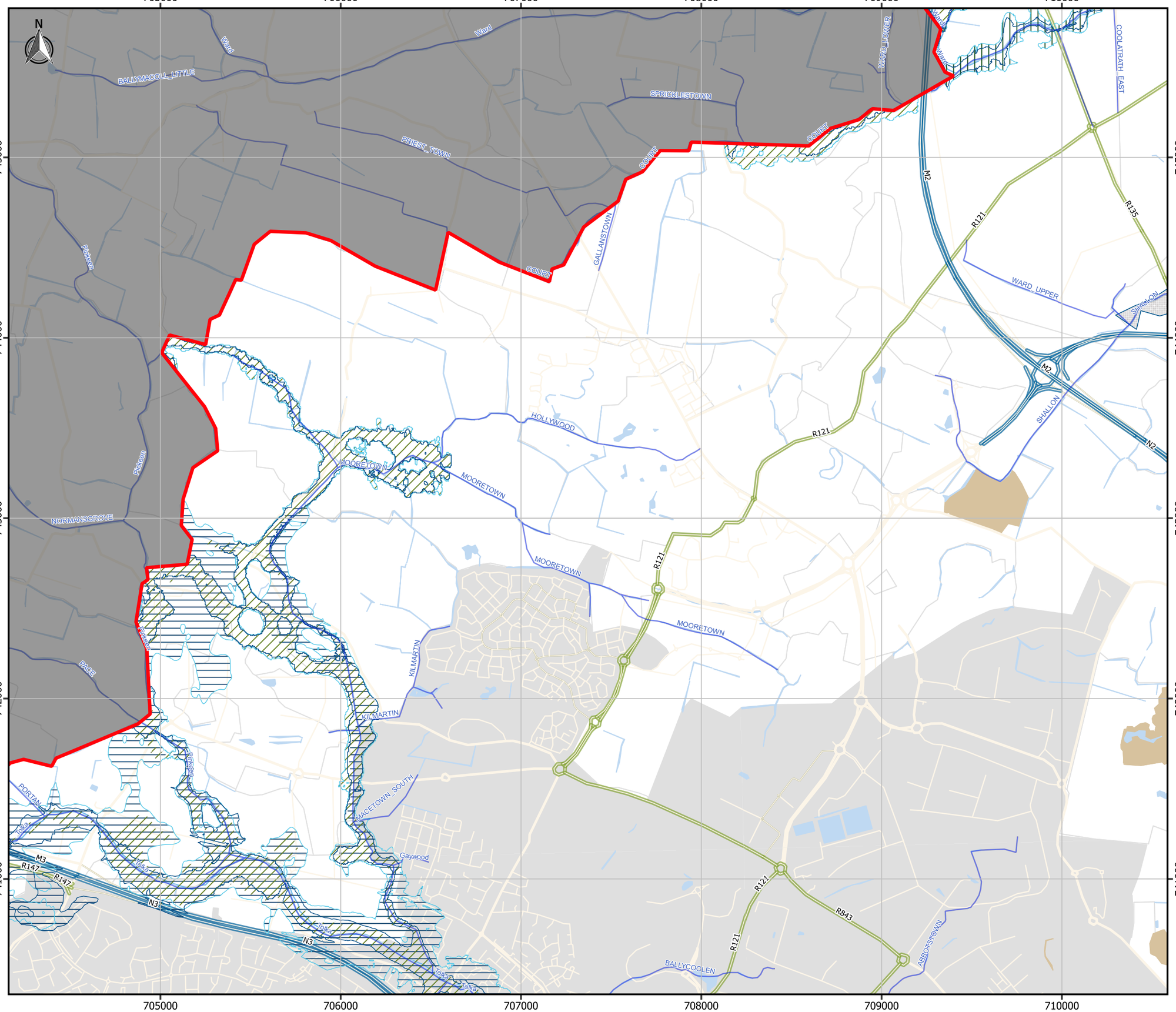

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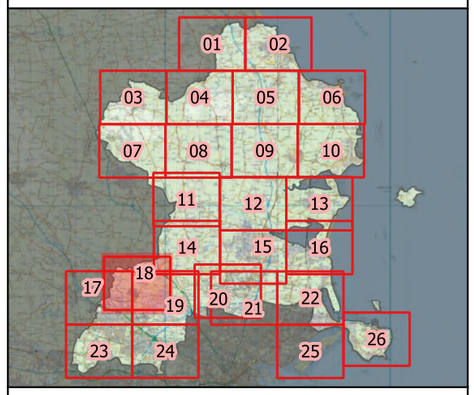

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

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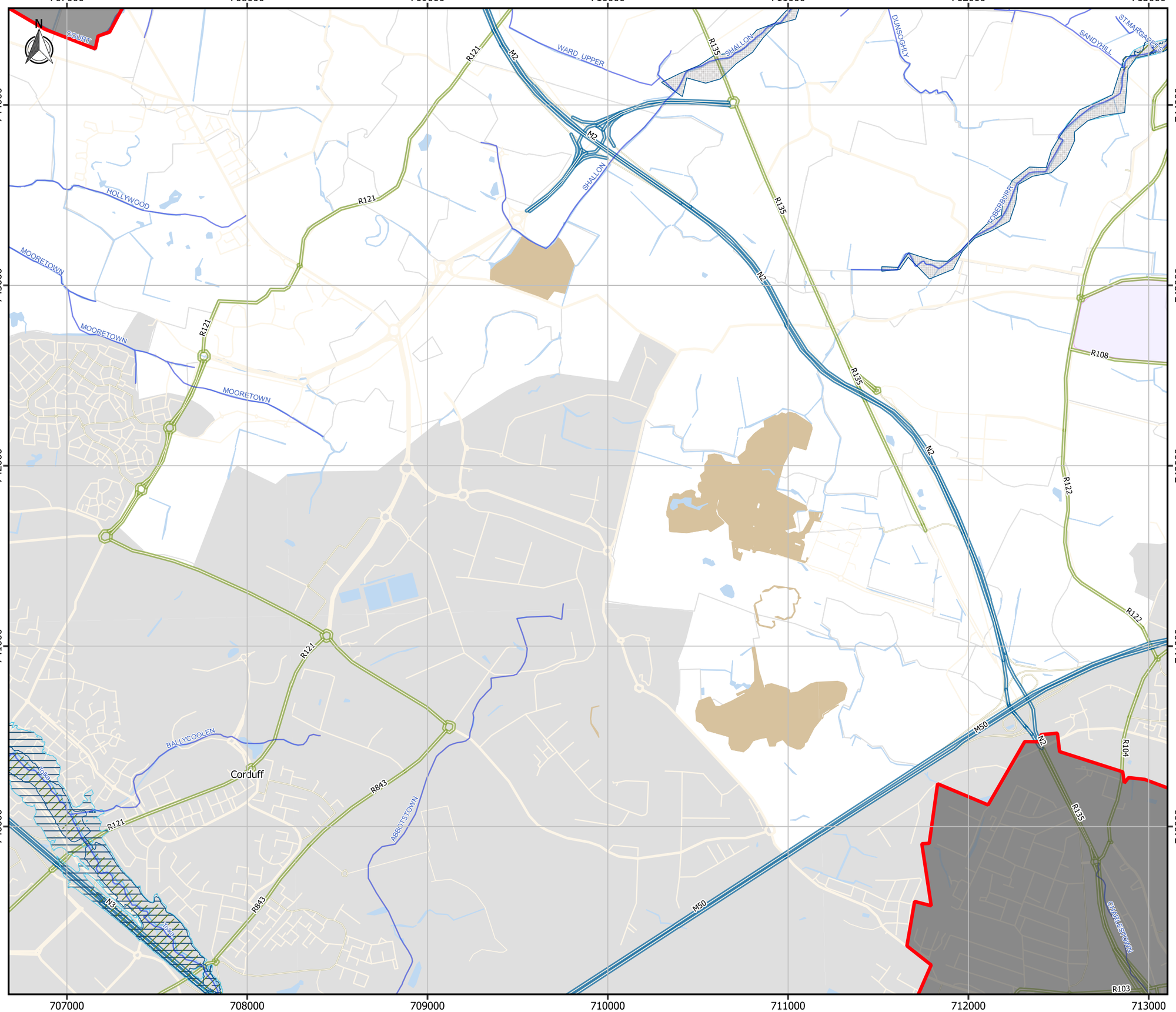

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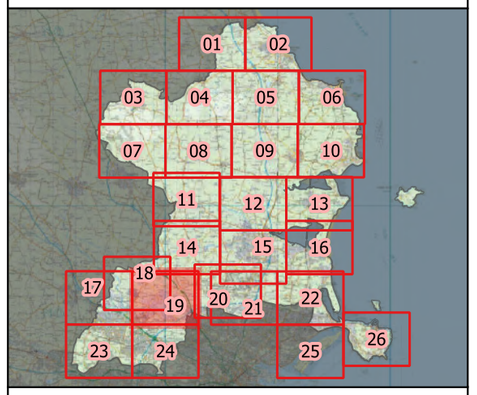

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

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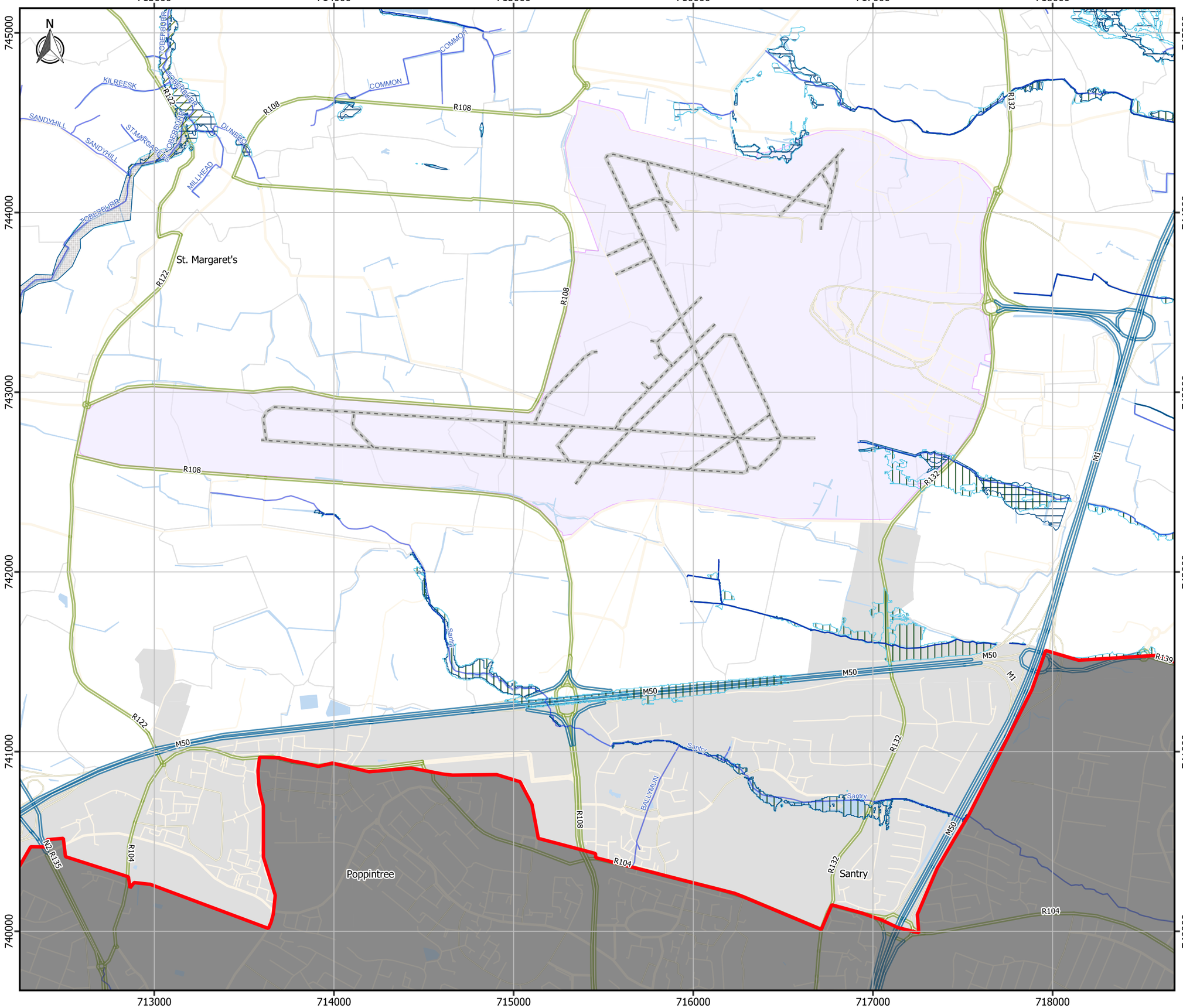

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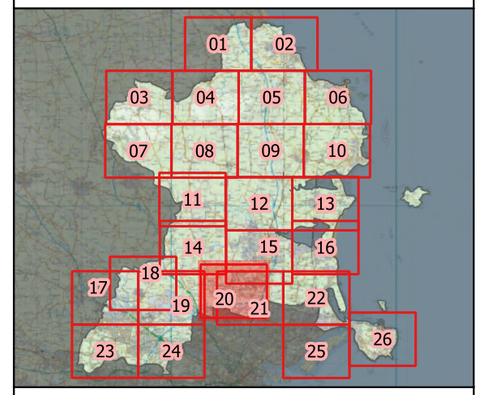

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

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MAP SERIES:		PAGE 20 OF 26
DRAWING SCALE:		1:20000 @ A3

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744000 743000 742000 741000 740000

N

R108 R132 MARSHALLSTOWN M1 M50 R139 R104 R103 BALLYMUN Santry

Poppintree Santry Ballymun Kilmore Glasnevin North Coolock

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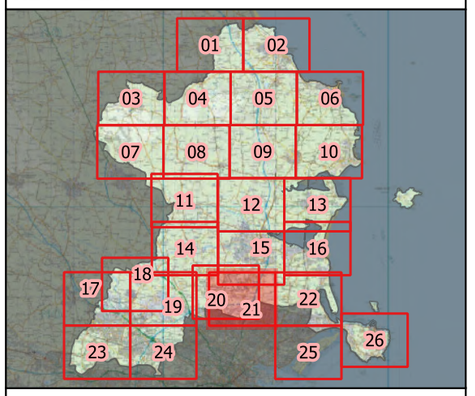

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
- CFRAM / FEMFRAMS
- National Indicative Fluvial Mapping (NIFM)
- National Coastal Flood Hazard Mapping (NCFHM)
- PFRA

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CHECKED BY:	PS	DATE: 22/02/2022
APPROVED BY:	DKS	DATE: 22/02/2022
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MAP SERIES:		PAGE 21 OF 26
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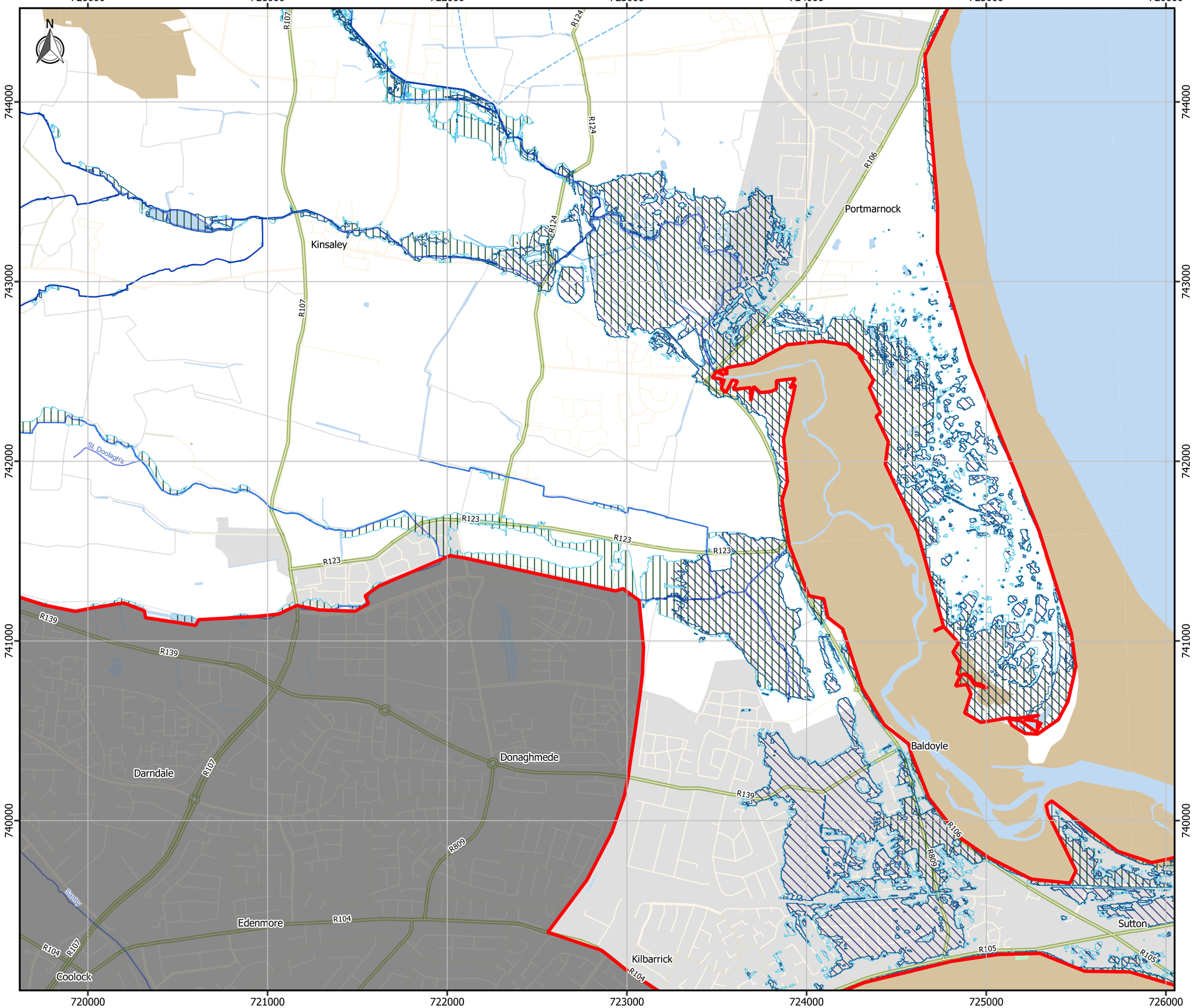

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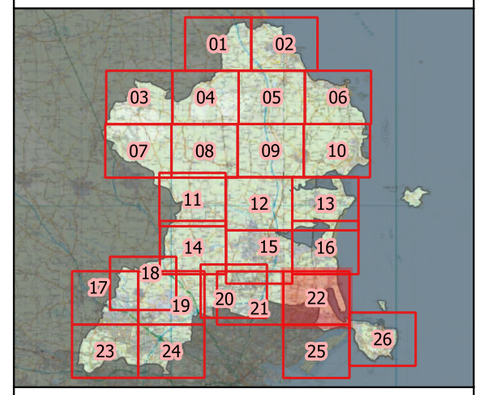

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
- CFRAM / FEMFRAMS
- National Indicative Fluvial Mapping (NIFM)
- National Coastal Flood Hazard Mapping (NCFHM)
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APPROVED BY:	DKS	DATE: 22/02/2022
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MAP SERIES:		PAGE 22 OF 26
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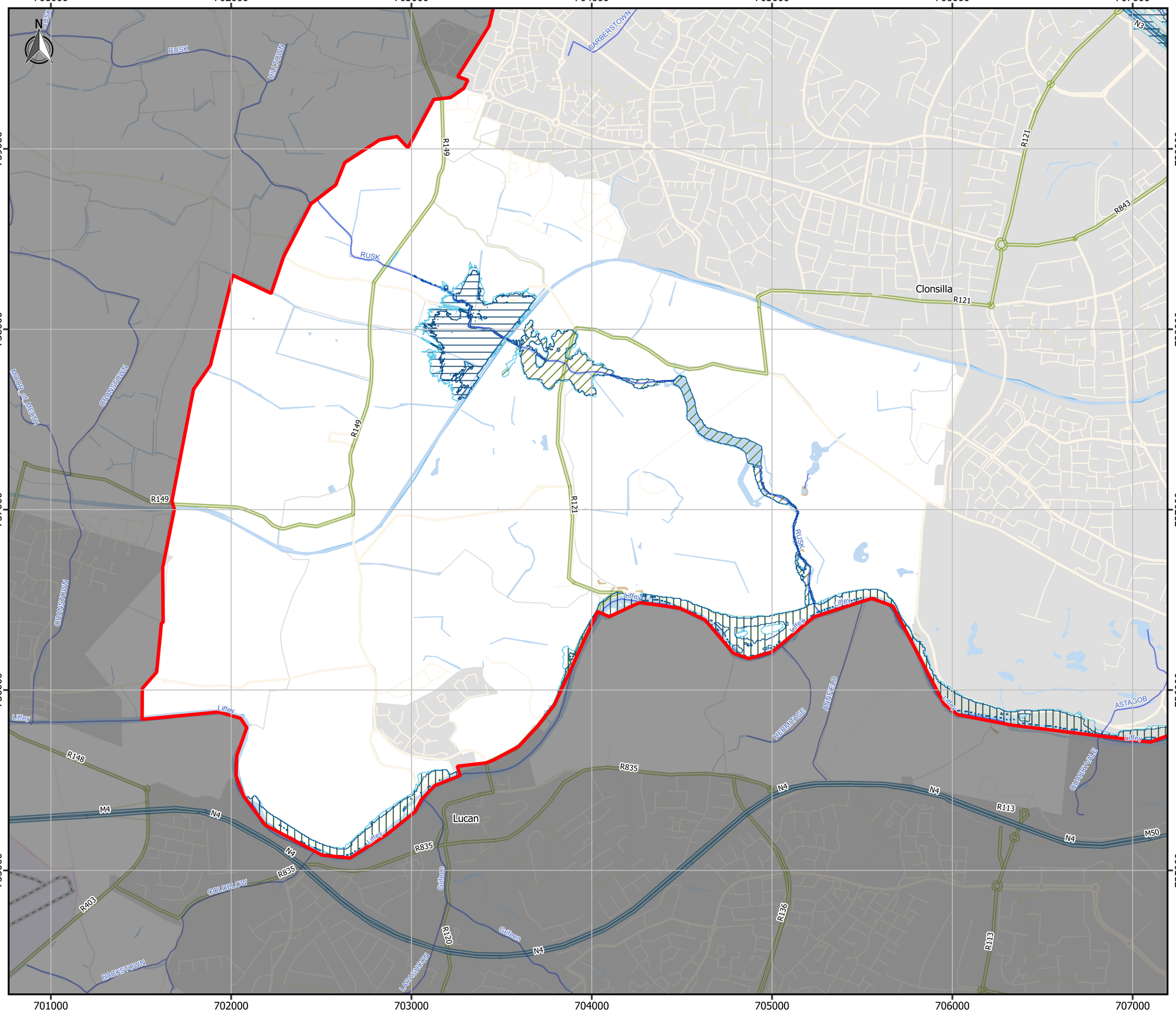

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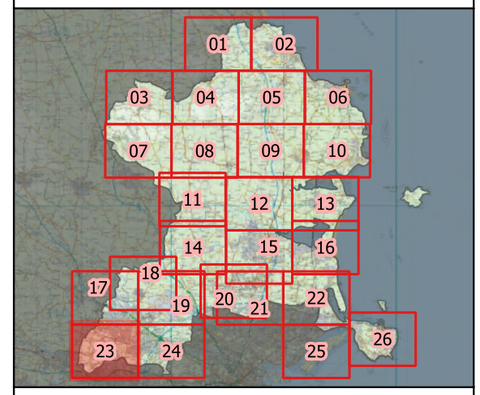

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
- CFRAM / FEMFRAMS
- National Indicative Fluvial Mapping (NIFM)
- National Coastal Flood Hazard Mapping (NCFHM)
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APPROVED BY:	DKS	DATE: 22/02/2022
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MAP SERIES:		PAGE 23 OF 26
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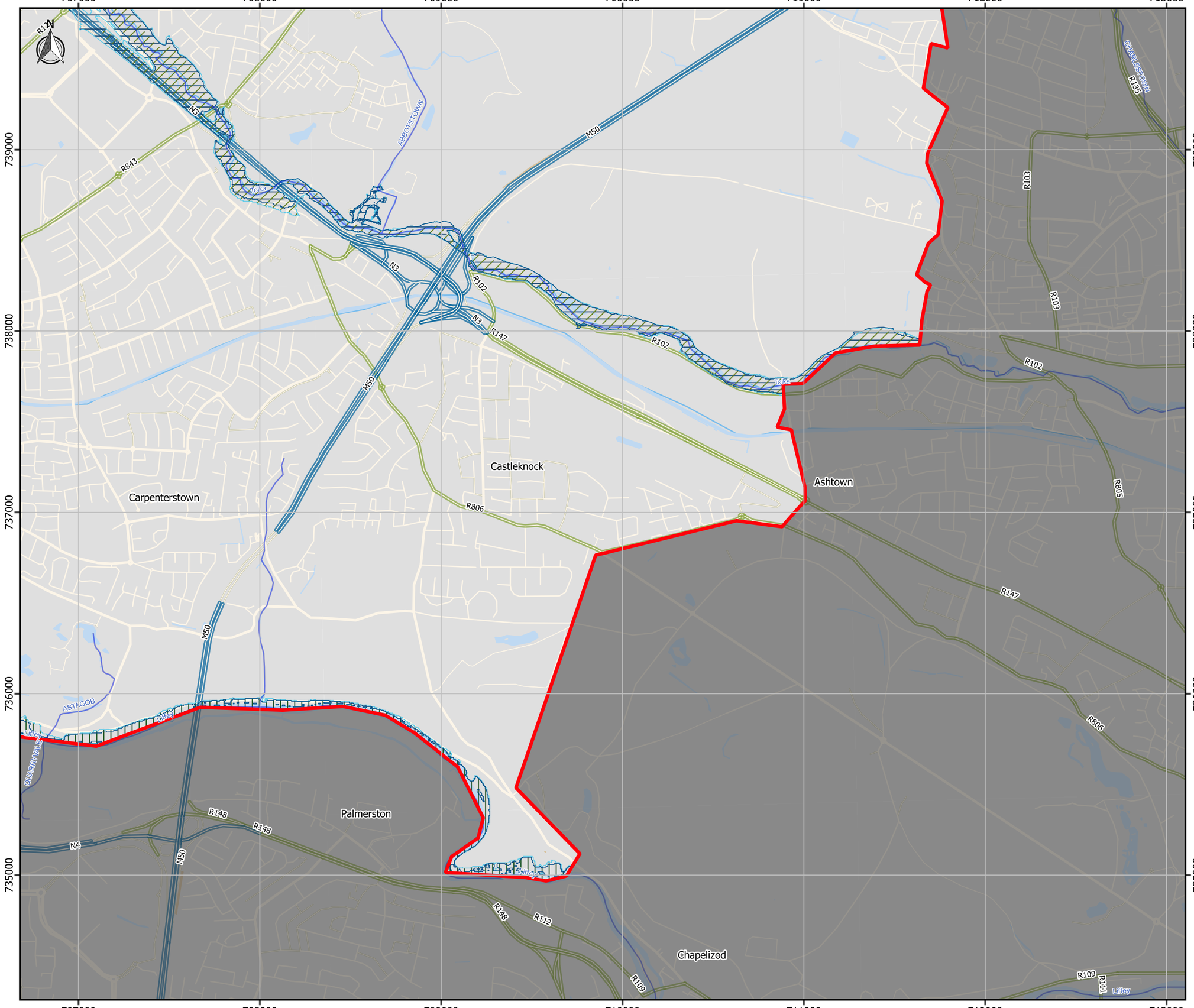

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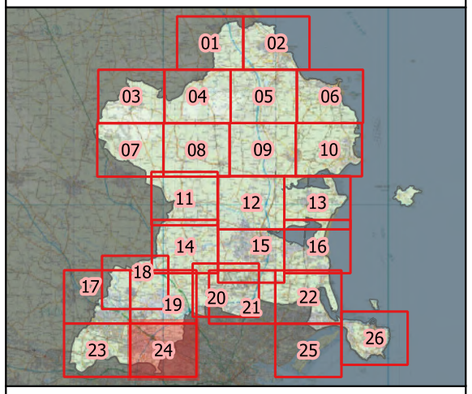

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
- CFRAM / FEMFRAMS
- National Indicative Fluvial Mapping (NIFM)
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APPROVED BY:	DKS	DATE: 22/02/2022
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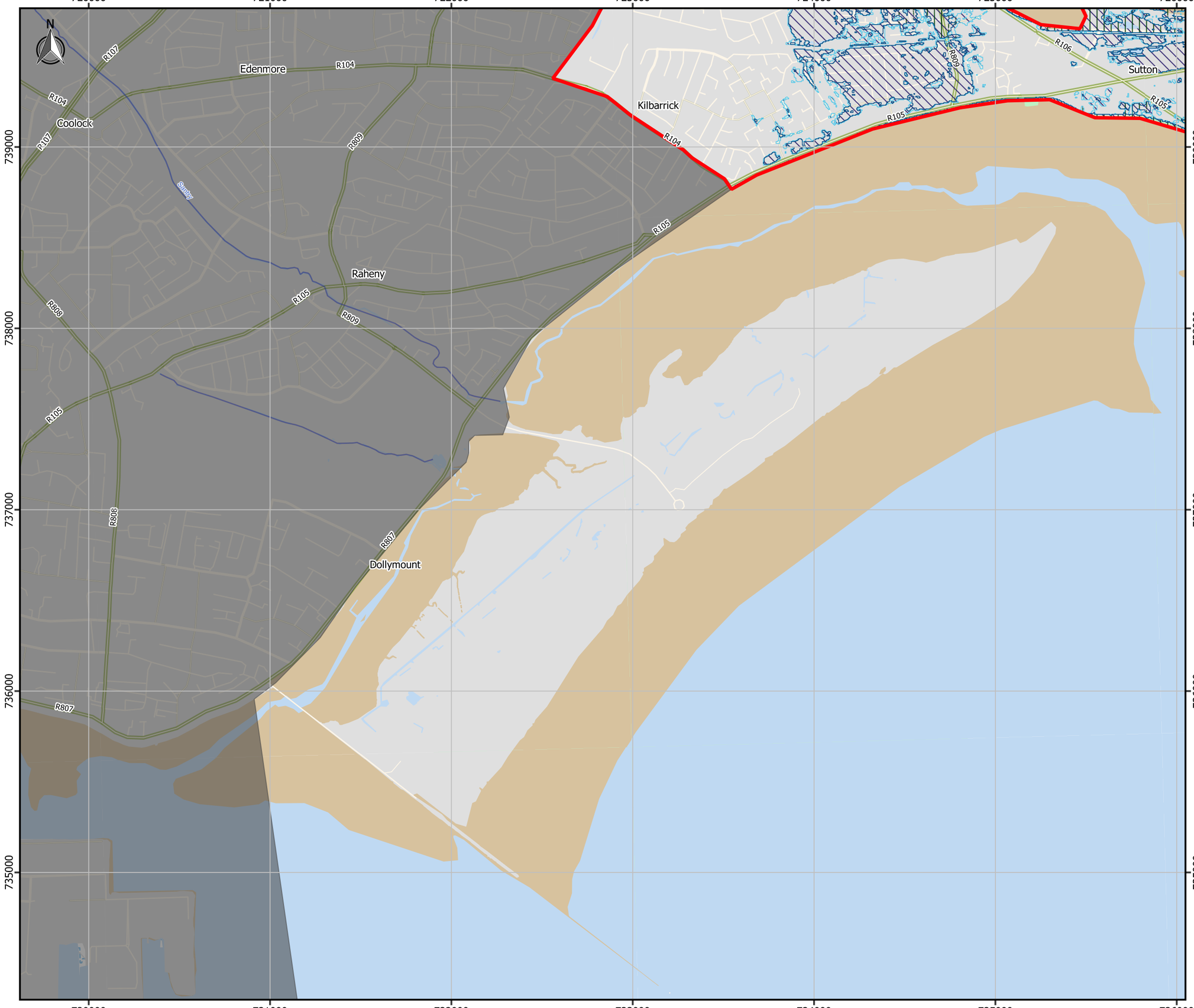
MAP SERIES:		PAGE 24 OF 26
DRAWING SCALE:		1:20000 @ A3



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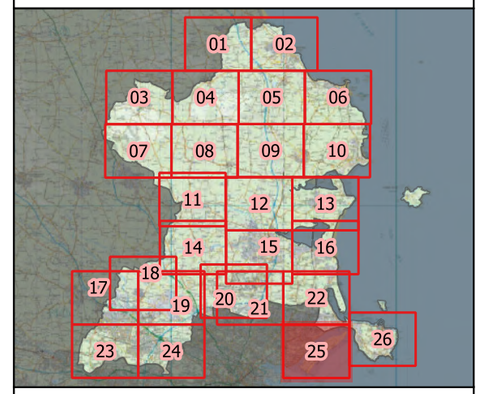

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
- CFRAM / FEMFRAMS
- National Indicative Fluvial Mapping (NIFM)
- National Coastal Flood Hazard Mapping (NCFHM)
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APPROVED BY:	DKS	DATE: 22/02/2022
DRAWING NUMBER:	M02127-06_FIG_FL425	
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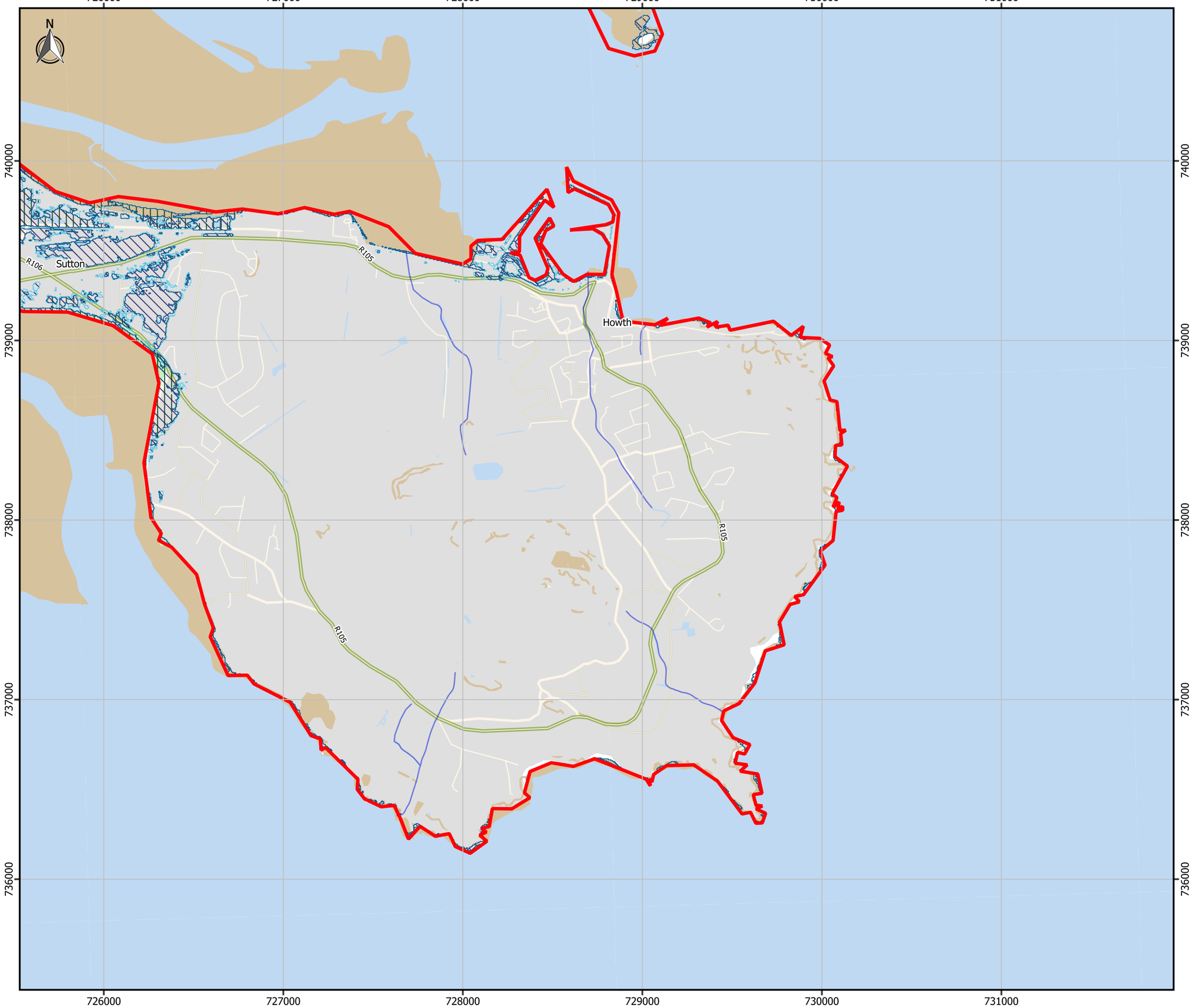
DRAWING SCALE:		1:20000 @ A3



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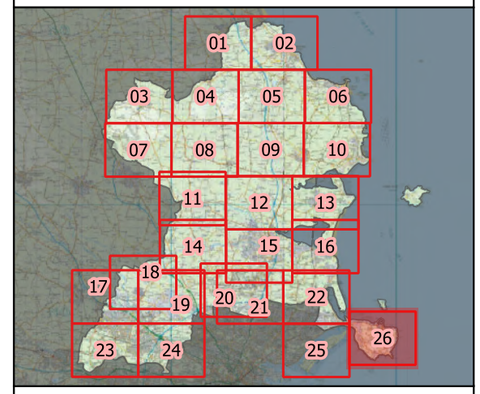

LEGEND

- Fingal County Administrative Boundary
- Watercourses
- Flood Zone A Extent
- Flood Zone B Extent

Data Source Used

- LAP / Masterplan SFRA
- CFRAM / FEMFRAMS
- National Indicative Fluvial Mapping (NIFM)
- National Coastal Flood Hazard Mapping (NCFHM)
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MAP SERIES:		PAGE 26 OF 26
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