LOUTH COUNTY DEVELOPMENT PLAN 2021-2027

STRATEGIC FLOOD RISK ASSESSMENT (SFRA)

VOLUME 5

NOTE: A Strategic Flood Risk Assessment (SFRA) for Dundalk was carried out as part of the preparation of the Dundalk Local Area Plan. The flood zones, associated analysis and supporting information detailed in the SFRA for the Dundalk Local Area Plan is the most up to date information available for Dundalk and should therefore be the reference document for any flood related reports/analysis as they relate to Dundalk. This SFRA has been included as an appendix to the SFRA for the County Development Plan.

Section 1

1.1 Introduction to the Strategic Flood Risk Assessment (SFRA)

The Louth County Development Plan 2021-2027 will replace the existing Louth County Development Plan 2015-2021. This report details the SFRA for County Louth and has been prepared in accordance with requirements of the Department of Housing, Local Government and Heritage and Office Public Works OPW Planning Guidelines, 'The Planning System and Flood Risk Management' (2009). The SFRA provides tools and methods to assist users in identifying the level of flood risk associated with an area to inform planning decisions. It supports the application of the sequential approach and provides data and maps to help in assessing sites against flood risk criteria. Where development is or would be at risk of flooding, it provides information on the mitigation measures considered deliverable to reduce the actual risk to that development and on the residual risks that would remain and how they might be managed.

1.2 Report Structure

The SFRA, prepared for and informing the Louth County Development Plan 2021-2027, considers the broad settlement strategy of the Regional Spatial and Economic Strategy (RSES) for the Eastern and Midlands Region and the countywide policy objectives of the Louth County Development Plan. Framed within this context, the report will *inter alia*:

- Provide a brief background to the study area;
- Explain the concepts and definitions of flood risk terms;
- Review the indicators of flood risk based on the data available;
- Detail the methodology behind the preparation of the Flood Zone Mapping;
- Discuss recommended policy objectives for flood risk management in relation to the Louth County Development Plan 2021-2027.

  The SFRA includes a review of flood risk in each settlement identified in the Louth Settlement Hierarchy (See Chapter 2, Table 2.4), including Drogheda, Dundalk, Ardee and Dunleer indicating where application of these policy objectives is adequate to allow future development or where high development pressures require a more detailed assessment of flood risk.

1.3 Scope and Objective

The purpose of the SFRA under the 'Planning System and Flood Risk Management' is;

> "To provide a broad (area-wide) assessment of all types of flood risk to inform strategic land-use planning decisions. SFRAs enable the Local Authority to undertake the sequential approach, including the Justification Test, allocate appropriate sites for development and identify how flood risk can be reduced as part of the development plan process."

More specifically, the SFRA will complete the following tasks;

- Undertake a flood risk assessment for the settlements within the LCDP;
- Review and update Flood Zone mapping to include the CFRAM mapping;
- Assist Louth County Council (LCC) in the review of land use zoning objectives and the application of the sequential approach and justification test;
- Prepare flood risk management policies, objectives and recommendations.

1.4 Flood Legislation and Policy

1.4.1 European Union (EU) Floods Directive

The OPW is the national authority responsible for the implementation of the EU Directive on the Assessment and Management of Flood Risks [2007/60/EC] which was transposed into Irish law by the EU (Assessment and Management of Flood Risks) Regulations SI 122 of 2010. An objective of the CFRAM Programme is to achieve compliance with the requirements of the EU Floods Directive. The aim of the EU Floods Directive, which came into force in 2007, is to reduce the adverse consequences of flooding on human health, the environment, cultural heritage and economic activity. The Directive requires Member States to undertake three key steps of analysis and planning:

- The Preliminary Flood Risk Assessment (PFRA): A screening of flood risk to identify Areas of Potentially Significant Flood Risk (APSFR), which were referred to as Areas for Further Assessment (AFA) for the National CFRAM Programme. The PFRA is a preliminary assessment, based on available or readily-derivable information.
- The Flood Maps: The preparation of flood hazard and risk maps for the APSFRs.
- The Flood Risk Management Plans (FRMPs): The preparation of plans setting out objectives and a set of measures aimed at the management and reduction of flood risk within the APSFR.

In undertaking these three key steps, the Directive also requires Member States to exchange information and coordinate across borders, to coordinate with the implementation of the Water Framework Directive (WFD) and to publish the PFRA and Maps as well as encouraging the active involvement of interested parties in the preparation of the FRMPs. The 'Floods' Directive is cyclical, requiring a review of the PFRA, the Flood Maps and the FRMP's on a six yearly cycle.

1.4.2 National Policy

In line with changing national and international concepts on how to manage flood risk most effectively and efficiently, a review of national flood policy was undertaken in 2003/2004. The review was undertaken by an Inter-Departmental Review Group, led by the Minister of State at the Department of Finance with special responsibility for the OPW.

The Review Group prepared a report that was put to Government, and subsequently approved and published in September 2004 (Report of the Flood Policy Review Group, OPW, 2004). The scope of the review included an evaluation of the roles and responsibilities of the different bodies with responsibilities for managing flood risk and to set a new policy for flood risk management in the State into the future.

This led to the development and implementation of the National Catchment-based Flood Risk Assessment and Management (CFRAM) Programme that was designed to:

- Focus on managing flood risk, rather than relying only on flood protection measures aimed at reducing flooding;
- Taking a catchment-based approach to assess and manage risks within the whole-catchment context;
- Being proactive in assessing and managing flood risks, including the preparation of flood maps and flood risk management plans.

The OPW undertook the CFRAM Programme to give a clear and comprehensive picture of flood risk in areas of potentially significant flood risk and to set out how to manage the flood risk effectively and sustainably.

The Programme focused on 300 communities in Six CFRAM study areas (covering 29 River Basins) at potentially significant flood risk, referred to as Areas for Further Assessment (AFAs), eight of which were located in County Louth:

- Dundalk & Blackrock (Neagh Bann Study);
- Drogheda (Eastern Study);
- Carlingford (Neagh Bann Study);
- Greenore (Neagh Bann Study);
- Annagassan(Neagh Bann Study);
- Ardee (Neagh Bann Study);
- Termonfeckin (Neagh Bann Study); and
- Baltray (Eastern Study).

The CFRAM Programme led to the development of 29 Flood Risk Management Plans.

The 29 Flood Risk Management Plans (FRMP's) set out the proposed measures both structural and non-structural, to manage flood risk, which were approved by the Minister for Public Expenditure and Reform in 2018.

The Neagh Bann FRMP and the Eastern FRMP were subsequently adopted by LCC. These Plans set out the strategy, including a set of proposed measures, for the cost-effective and sustainable long-term management of flood risk in the River Basins, including the areas where the flood risk has been determined as being potentially significant.

Implementing all the measures set out in these plans requires a significant capital investment and it has therefore, been necessary to prioritise the investment required to implement the national set of proposed measures. LCC has been allocated funding to implement the following Flood Relief Schemes and is now working with the OPW on their delivery, which will occur during the lifetime of this Plan:

- Dundalk and Ardee Flood Relief Scheme;
- Drogheda and Baltray Flood Relief Scheme; and
- Carlingford and Greenore Flood Relief Scheme.

Section 2

2.1 Study Area

This Section provides an overview of the study area on which the impact of flooding will be determined in this SFRA. The study area comprises the entire County of Louth, which is the most northern county in the Eastern and Midland Region. The County is 827km² (319sq. miles) in area and had a population in 2016 of 128,884. The County contains the largest and third largest towns in Ireland, which were classified as Regional Growth Centres within the RSES. Drogheda lies at the southern extremity of the County whilst Dundalk is located in the northern portion of the County. Despite being Ireland's smallest county, it is also one of the most densely populated counties outside of Dublin with a population density of 156 persons per km^2. The landscape is one of contrasts. The south is generally flat with gentle rolling hills, whilst the north is characterised by the mountainous landscapes of the Cooley Peninsula with Slieve Foy, the highest mountain reaching a height of 588 metres.

Map 1: Map of Ireland indicating County Louth

2.1.1 Drainage Catchments

The County is defined along its entire eastern edge by the Irish Sea coastline which extends to in excess of 88km. Whilst the northern section of the County is defined by Carlingford Lough, inland the Rivers Dee, Fane, Glyde and Boyne drain the lowlands of the County.

2.1.2 People and Infrastructure

Louth's population in 2016 was 128,884 persons with in excess of 66% of the entire population living in urban areas. Of this, 56.7% of the population lived in Drogheda and Dundalk. Other significant settlements within the County include Ardee, Dunleer, Clogherhead, Termonfeckin, Tullyallen, Carlingford and Castlebellingham/Kilsaran. In national terms, County Louth can be considered as relatively urbanised. Settlements of significant size in County Louth are as indicated in Table 1 below:

Table 1: Settlements of Significant Size in County Louth

Settlement	Population 2016
Drogheda	34,199[i]
Dundalk	39,004
Ardee	4,928
Dunleer	1,822
Clogherhead	2,145
Termonfeckin	1,579
Tullyallen	1,547
Carlingford	1,445
Castlebellingham/Kilsaran	1,126

County Louth is strategically located on the Dublin-Belfast Economic Corridor, an important cross border network upon which Drogheda and Dundalk are located. These two Regional Growth Centres seek to build on their potential to develop as cities of scale and drivers of national and regional economic growth, investment and prosperity.

As a result of its strategic location, combined with high quality road and rail infrastructure, accessibility to ports and airports both north and south of the border, high speed broadband and a skilled and educated workforce, County Louth is well placed to continue to grow and prosper in terms of population and its economy. Louth has two hospitals (Our Lady of Lourdes in Drogheda and the Louth Hospital in Dundalk), the Dundalk Institute of Technology, the Drogheda Institute of Further Education and a considerable number of primary and post-primary schools.

In addition, there are three commercial ports in the County at Drogheda, Greenore and Dundalk together with a major fishing port at Clogherhead.

The County possesses a network of attractive and inviting towns and villages interspersed with a diverse range of landscapes and natural environment, home to its rich and varied natural and built heritage, which collectively, contribute substantially to the County's character, identity and sense of place.

[i] Drogheda in County Louth (excluding Drogheda in County Meath)

2.2 Environment

County Louth has a variety of natural and semi-natural habitats supporting a range of wild plant and animal species and ecosystems, which collectively contribute to the unique biodiversity of the County. In total, there are 11 designated European Sites which are located wholly or partly in County Louth forming part of the EU-wide Natura 2000 Network.

This network includes both Special Areas of Conservation (SAC) and Special Protection Areas (SPAs) representing the prime wildlife conservation areas in the country which are considered to be of significant importance at both European and Irish levels. The boundaries of the protected areas may alter during the lifetime of the Plan and additional areas may be designated. There are five Special Protection Areas (SPA's) in County Louth as detailed in Table 2. In addition to the SPA's there are 6 Special Areas of Conservation (SAC's) in County Louth which are detailed in Table 3.

Table 2: Special Protection Areas (SPA's) in County Louth

Special Protection Areas	Site Code
Carlingford Lough	004078
Dundalk Bay	004026
Stabannan and Braganstown	004091
Boyne Estuary	004080
River Boyne and River Blackwater	004232

Table 3: Special Areas of Conservation (SAC's) in County Louth

Special Areas of Conservation	Site Code
Carlingford Mountain	000453
Dundalk Bay	000455
Clogherhead	001459
Boyne Coast and Estuary	001957
River Boyne and River Blackwater	002299
Carlingford Shore	002306

The National Parks and Wildlife Service (NPWS) proposed 24 ecological Natural Heritage Areas in Louth, which are listed in Table 4.

The process of designation of these sites is ongoing and it is anticipated that a number of pNHAs will be awarded full designated status during the lifetime of this Plan.

Table 4: Proposed Natural Heritage Areas (pNHA) in County Louth

Proposed Natural Heritage Areas (pNHA)	Site Code
Carlingford Lough	0452
Stabannan-Braganstown	0456
Blackhall Woods	1293
Liscarragh Marsh	1451
Ardee Cutaway Bog	1454
Castlecoo Hill	1458
Darver Castle Woods	1461
Drumcah, Toprass & Cortial Loughs	1462
Mellifont Abbey Woods	1464
Woodland at Omeath Park	1465
Trumpet Hill	1468
Louth Hall and Ardee Woods	1616
Barmeath Woods	1801
Stephenstown Pond	1803
King William's Glen	1804
Ravensdale Plantation	1805
Kildemock Marsh	1806
Reaghstown Marsh	1828
Dunany Point	1856
Boyne Coast and Estuary	1957
Boyne River Islands	1862
Carlingford Mountain	0453
Clogherhead	1459
Dundalk Bay	0455

2.3 Planning Policy

2.3.1 Ireland 2040 – National Planning Framework (NPF)

A Strategic Flood Risk Assessment of the National Policy Objectives (NPO's) within the Project Ireland 2040 - National Planning Framework was undertaken to ensure flood risk is a key consideration in delivering the proposed strategic sustainable land-use planning decisions. It sets out how all levels of the planning process, from national level strategic assessments to individual planning applications, should follow the sequential approach set out in The Planning System and Flood Risk Management Guidelines 2009, prepared jointly by the OPW and the DoEHLG. The NPF acknowledges that it is not always possible to avoid developing in flood risk areas due to spatial, economic, environmental and physical constraints. Development should be encouraged to continue, and in flood risk areas should follow the sequential approach and application of the Justification Test as set out in the aforementioned Guidelines. These guidelines will facilitate the integration of flood risk and land use planning in the Eastern and Midland Region, at all tiers of the planning hierarchy from National level through Regional, City/County and Local plans, masterplans and individual planning applications.

2.3.2 Regional Spatial & Economic Strategy (Eastern & Midland Regional Assembly)

The Regional Spatial & Economic Strategy (RSES) for the Eastern & Midland Regional Assembly included a Regional Flood Risk Appraisal Report, undertaken at a high level, but with a view to informing policy decisions within lower tier development plans. The RSES found that an integrated approach to river catchment management is essential to manage and avoid increasing flood risk. The RSES sets out how development plans should include Strategic Flood Risk Assessments and all future zoning of land for development in areas at risk of flooding should follow the sequential approach set out in the Planning System and Flood Risk Management Guidelines 2009. The inclusion of policies and actions to support Sustainable Urban Drainage Systems (SuDS) are recommended in future developments as a major component of flood management and prevention.

The settlement hierarchy selected by the RSES takes account of the fact that while areas of Drogheda and Dundalk are vulnerable to flooding, wider, effective management of flood risk coupled with wider environmental, sustainability and economic considerations mean that it is possible to facilitate the continued consolidation of the development of the existing urban structure of the region. In line with the Sequential Approach and Justification Criteria set out in the Guidelines, it is considered that these locations should be encouraged to continue to consolidate and to grow.

This will ensure a more compact and sustainable urban development form while at the same time managing flood risk appropriately. The Guidelines outline measures through which the flood risk can be managed to allow the continued development of the Regional Growth Centres of Drogheda and Dundalk.

The RSES included a number of development plan implications:

- An integrated approach to river catchment management is essential to manage and avoid increasing flood risk. Local authorities should fully support the implementation of the Flood Risk Measures identified in the CFRAM Flood Risk Management Plans.
- Development Plans shall include Strategic Flood Risk Assessments. All future zoning of land for development in areas at risk of flooding should follow the sequential approach set out in The Planning System and Flood Risk Management Guidelines (2009),
- Development Plans should include policies on the requirement for Sustainable Drainage Systems (SuDS) in future developments as a major component of flood management and prevention.

2.3.3 Louth County Development Plan 2015-2021

A SFRA was undertaken as part of the Louth County Development Plan 2015-2021. The purpose of the SFRA was to present and analyse flood related data at appropriate scales to identify flood risk management priorities for the County. Parts of County Louth are vulnerable to flooding and the vulnerability of these areas can be increased due to human actions such as clearing of vegetation and increased development in flood plains. As flooding cannot be completely eliminated, the Louth County Development Plan 2015-2021 sought to minimise its impacts through proactive and careful management of catchments and identified flood risk areas and by ensuring that any development does not individually or cumulatively give rise to new flood risk.

The SFRA proposed this be completed by following the Sequential Approach and application of the Justification Test set out in the 2009 Guidelines on Planning and Flood Risk Management (DoEHLG) throughout the planning process.

2.4 Settlement Strategy

The Louth County Development Plan 2021-2027 identifies a hierarchy of settlements within County Louth as detailed in Table 5 below.

Table 5: Settlement Hierarchy for County Louth

Settlement Level	Settlement Category	Settlement
1	Regional Growth Centres	Drogheda Dundalk
2	Self-Sustaining Growth Towns	Ardee Dunleer
3	Self-Sustaining Town	Carlingford, Clogherhead, Castlebellingham/Kilsaran, Termonfeckin, Tullyallen
4	Small Towns and Villages	Annagassan, Baltray, Collon, Dromiskin, Knockbridge, Louth Village, Omeath, Tallanstown
5	Rural Nodes	Bellurgan, Ballagan, Ballapousta, Darver, Dromin, Faughart, Glenmore, Grange, Grangebellew, Greenore, Gyles Quay, Kilcurry, Kilkerley, Lordship, Mountbagnal, Muchgrange, Philipstown (Collon), Ravensdale, Reaghstown, Sandpit, Sheelagh, Stabannon, Tinure, Willville

This Louth County Development Plan 2021-2027 incorporates the functional area of the entire county. It includes the two Regional Growth Centres of Drogheda and Dundalk, the Self-Sustaining Growth Towns of Ardee and Dunleer, the Self-Sustaining Towns, the small towns and villages and the rural nodes. The rural nodes pertain to mapped development envelopes only.

Section 3

3.1 Flood Risk

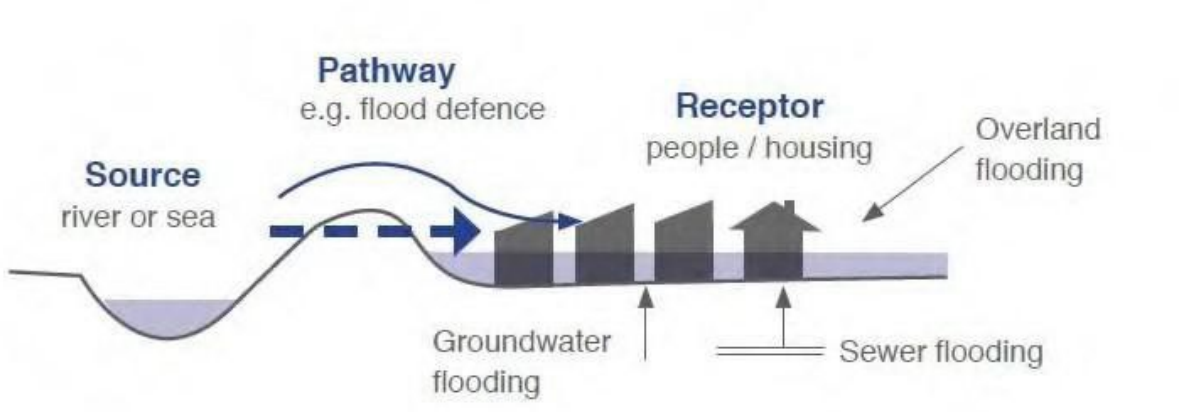
In order to manage flood risk it is important to understand what the term *"flood risk"* implies and to define the components of flood risk in order to apply the principles of The Planning System and Flood Risk Management - Guidelines for Planning Authorities. The Guidelines describe flooding as a natural process that can occur at any time and in a wide variety of locations. Flooding can often be beneficial and many habitats rely on periodic inundation. However, when flooding interacts with human development it can threaten people, their property and the environment.

Flood risk is generally accepted to be a combination of the likelihood of flooding and the potential consequences arising, and is normally expressed in terms of the following relationship:

Flood Risk = Probability of Flooding X Consequences of Flooding

The assessment of flood risk requires an understanding of the sources, the flow path of floodwater and the people and property that can be affected. The *source - pathway – receptor model,* shown in Figure 1 below*,* illustrates this and is a widely used environmental model to assess and form the management of risk.

Figure 1 Source-Pathway-Receptor Model



Source: Planning System and Flood Risk Management 2009

This is a standard environmental risk model common to many hazards and should be the starting point of any Flood Risk Assessment. Principal sources of flooding are intense or prolonged rainfall or, higher than normal sea levels which can be of particular concern in a coastal county such as Louth, while the most common pathways are rivers, drains, sewers, overland flow and river and coastal floodplains and their defence assets.

Receptors can include people, their property and the environment. All three elements must be present for flood risk to arise.

Mitigation measures, such as defences or flood resilient construction, have little or no effect on sources of flooding but they can block or impede pathways or remove receptors.

Flood risk assessments require identification and assessment of all three components listed below:

1. The probability and magnitude of the source(s) (e.g. high river levels, sea levels and wave heights).
2. The performance and response of pathways and barriers to pathways such as floodplain areas and flood defence systems.
3. The consequences to receptors such as people, properties and the environment.

The planning process is primarily concerned with the location of receptors, taking appropriate account of potential sources and pathways that might put those receptors at risk.

3.2 Probability of Flooding

The likelihood of flooding is normally expressed as the percentage probability based on the average frequency measured or extrapolated from records over a large number of years. A 1% probability indicates the flood level that is expected to be reached, on average once in 100 years, i.e. it has a 1 in 100 chance of occurring in any one year.

Considered over the lifetime of development, such an apparently low-frequency or rare flood has a significant probability of occurring. For example:

- A 1% flood has a 22% (1 in 5) chance of occurring at least once in a 25-year period - the period of a typical residential mortgage;
- And a 53% (1 in 2) chance of occurring in a 75-year period - a typical human lifetime.

3.3 Consequences of Flooding

Consequences of flooding depend on the hazards caused by flooding (depth of water, speed of flow, rate of onset, duration, wave-action effects, water quality) and the vulnerability of receptors (type of development, nature, e.g. age-structure of the population, presence and reliability of mitigation measures). Table 3.1 of the Planning System and Flood Risk Management Guidelines provide three vulnerability categories, based on the type of development and these are summarised as:

- Highly vulnerable, including residential properties, essential infrastructure and emergency service facilities;
- Less vulnerable, such as buildings used for retail and commercial and local transport infrastructure;
- Water compatible, including amenity open space, outdoor recreation and associated essential infrastructure, such as changing rooms.

3.4 Definition of Flood Zones

In the Planning System and Flood Risk Management Guidelines, the likelihood of a flood occurring is established through the identification of Flood Zones. These zones indicate a high, moderate or low risk of flooding from fluvial or tidal sources, and are as defined in Table 6 below.

It is important to note that the Flood Zones do not take other sources of flooding, such as groundwater or pluvial, into account, so an assessment of risk arising from such sources should also be made.

Table 6: Definitions of Flood Zones

Flood Zone	Description
Zone A High Probability of Flooding	More than 1% probability (1 in 100) for river flooding and more than 0.5% probability (1 in 200) for coastal flooding. Most types of development would be considered inappropriate in this zone.
Zone B Medium Probability of Flooding	0.1% to 1% probability (between 1 in 100 and 1 in 1000) for river flooding and 0.1% to 0.5% probability (between 1 in 200 and 1 in 1000) for coastal 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.
Zone C Low Probability of Flooding	This zone defines areas with a low risk of flooding from rivers and the coast (i.e. less than 0.1% probability or less than 1 in 1000). Development in this zone is appropriate from a flooding perspective (subject to assessment of flood hazard from sources other than rivers and the coast).

Source: Planning System and Flood Risk Management 2009

It is important to note that the definition of Flood Zones is based on an undefended scenario and does not take into account the presence of flood protection structures such as flood walls or embankments. This is to allow for the fact that there is a residual risk of flooding behind the defences due to overtopping or breach and that there may be no guarantee that the defences will be maintained in perpetuity.

Section 4

4.1 Objectives and Principles of the Planning System and Flood Risk Management Guidelines

The Planning System and Flood Risk Management Guidelines describe good flood risk practice in planning and development management. Planning authorities are required to have regard to the Guidelines in the preparation of Development Plans and Local Area Plans, and for development control purposes. The objective of the Guidelines is to integrate flood risk management into the planning process, thereby assisting in the delivery of sustainable development. For this to be achieved, flood risk must be assessed as early as possible in the planning process. The Guidelines state that the core objectives are to:

- Avoid inappropriate development in areas at risk of flooding;
- Avoid new developments increasing flood risk elsewhere, including that which may arise from surface run-off;
- 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.

The Guidelines aim to facilitate "the transparent consideration of flood risk at all levels of the planning process, ensuring a consistency of approach throughout the country." SFRAs therefore become a key evidence base in meeting these objectives.

The Guidelines work on a number of key principles, including:

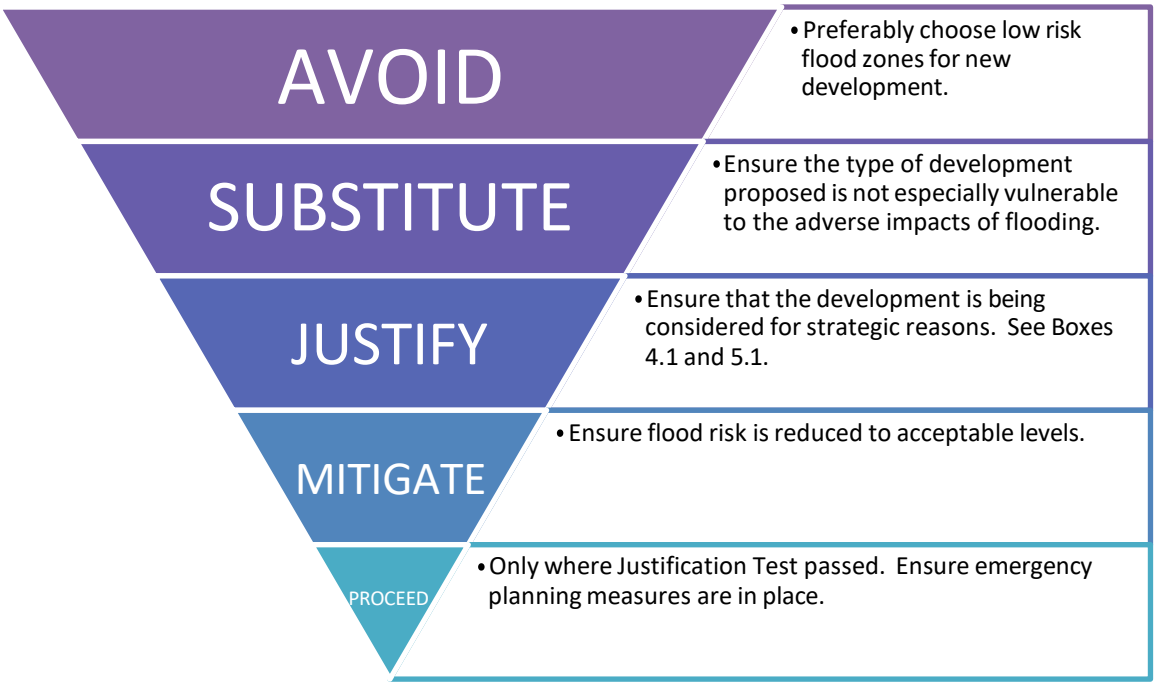
- Adopting a staged and hierarchical approach to the assessment of flood risk;
- Adopting a sequential approach to the management of flood risk, based on the frequency of flooding (identified through Flood Zones) and the vulnerability of the proposed land use.

4.2 The Sequential Approach and the Justification Test

Each stage of the FRA process aims to adopt a sequential approach to management of flood risk in the planning process (See Figure 2). For the purposes of applying the sequential approach, once flood risk has been identified, it should be considered whether it can be avoided. If following the initial assessment that the risks are too significant, it should consider whether avoidance is the only outcome.

Where possible, development in areas identified as being at flood risk should be avoided; this may necessitate de-zoning lands within the development plan. If de-zoning is not possible, then rezoning from a higher vulnerability land use, such as residential, to a less vulnerable use, such as open space may be required.

Figure 2: Sequential approach to management of flood risk in the planning process



4.3 Sequential Approach Principles in Flood Risk Management

Where rezoning is not possible, exceptions to the development restrictions are provided for, by way of a Justification Test. Many towns and cities have central areas that are affected by flood risk and have been targeted for growth. In County Louth, these include the Regional Growth Centres of Drogheda and Dundalk as identified in the RSES for the Eastern and Midland Region. To allow the sustainable and compact development of these urban centres, development in areas of flood risk may be considered necessary. For development in such areas to be allowed, the Justification Test must be passed.

The Justification Test has been designed to rigorously assess the appropriateness, or otherwise, of such developments.

The test is comprised of two processes; the plan-making Justification Test, which is undertaken for zoned settlements (See Appendix 1 of this SFRA) and the Development Management Justification Test. This is used at the planning application stage where it is intended to develop land that is at moderate or high risk of flooding for uses or development vulnerable to flooding that would generally be considered inappropriate for that land.

Tables 7 and 8 below indicate those types of development that would be appropriate to each flood zone and those that would be required to meet the Justification Test. Only if there are no reasonable sites available in zones of low flood probability should consideration be given to development in higher flood probability zones.

Table 7: Classification of vulnerability of different types of development

Vulnerability Class	Land uses and types of development which include:
High 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; and • 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 (SEVESO sites, IPPC sites, etc.) in the event of flooding.
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; and • 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, and • 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 on their own merits	

Table 8: Matrix of Vulnerability versus Flood Zone to illustrate Appropriate Development and that required to meet the Justification Test

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

Source: Planning System and Flood Risk Management

4.4 Scales and Stages of Flood Risk Assessment

Within the hierarchy of regional, strategic and site-specific flood risk assessments, a tiered approach ensures that the level of information is appropriate to the scale and nature of the flood risk issues and the location and type of development proposed, avoiding expensive flood modelling and development of mitigation measures where it is not necessary. The stages and scales of flood risk assessment are set out in Sections 4.4.1 – 4.4.3.

4.4.1 Regional Flood Risk Appraisal (RFRA)

The Regional Flood Risk Appraisal (RFRA) has been prepared as part of the Strategic Environmental Assessment of the Eastern & Midland RSES in accordance with National and EU legislation. The RFRA was prepared by considering the requirements of The Planning System and Flood Risk Assessment Guidelines for Planning Authorities (2009) and Circular PL02/2014 (August 2014). The purpose of the RFRA is to ensure that the RSES follows the principles of the Guidelines and implements policies and development strategies that:

- Avoid inappropriate development in areas at risk of flooding, unless there are proven wider sustainability grounds that justify appropriate development and where the flood risk can be reduced or managed to an acceptable level;
- Avoid developments increasing flood risk elsewhere;
- Adopt a sequential approach to flood risk management when assessing the location for new development based on avoidance, reduction and mitigation of flood risk;
- Avoid unnecessary restriction of National, Regional or Local economic and social growth;
- Incorporate flood risk assessments into the planning process;
- Improve the understanding of flood risk among relevant stakeholders; and
- 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.

4.4.2 Strategic Flood Risk Assessment (SFRA)

This provides an assessment of all types of flood risk informing land use planning decisions. This will enable the Planning Authority to allocate appropriate sites for development, whilst identifying opportunities for reducing flood risk. This SFRA for Louth will revisit the flood risk identification undertaken in the RFRA and give consideration to a range of potential sources of flooding. An initial flood risk assessment, based on the identification of Flood Zones, will also be carried out for those areas which will be zoned for development. Where the initial flood risk assessment highlights the potential for a significant level of flood risk or there is conflict with the proposed vulnerability of development, then a SFRA will be recommended for the settlement, which will necessitate a detailed flood risk assessment.

4.4.3 Site Specific Flood Risk Assessment (FRA)

This involves a site or project specific flood risk assessment to consider all types of flood risk associated with the site and propose appropriate site management and mitigation measures to reduce flood risk to and from the site to an acceptable level. If the previous tiers of study have been undertaken to appropriate levels of detail, it is highly likely that the site specific FRA will require detailed channel and site survey, and hydraulic modelling.

Table 9: Flood Risk Assessment Stages Required per Scale of Study Undertaken

	Flood Risk Identification	Initial Flood Risk Assessment	Detailed Flood Risk Assessment
Regional Flood Risk Assessment	R	U	U
Strategic Flood Risk Assessment – County Wide	R	P	U
Strategic Flood Risk Assessment, town within County Plan area	R	R	P
Site Specific Flood Risk Assessment	R	R	R

Source: Planning System and Flood Risk Management

P – Probably need to meet the requirements of the Justification Test
U – Unlikely to be needed
R – Required to be undertaken

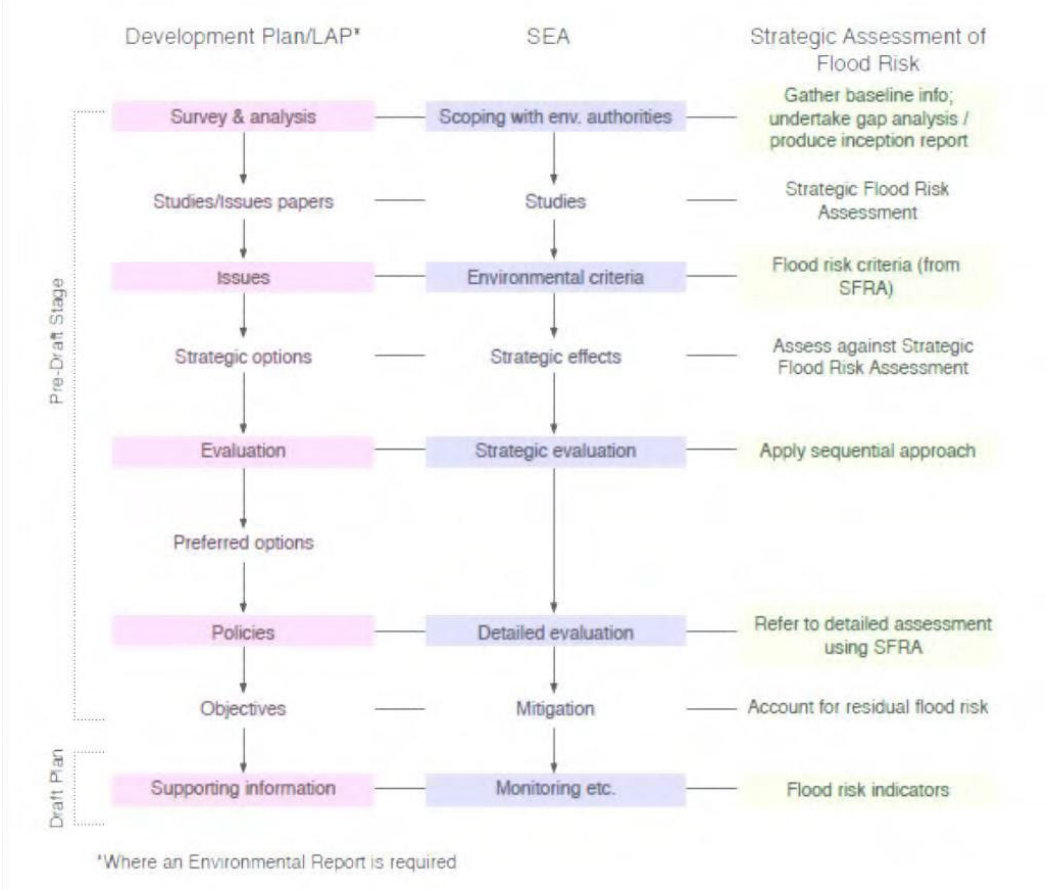
4.5 Strategic Flood Risk Assessment (SFRA) and Strategic Environment Assessment (SEA)

As detailed in The Planning System and Flood Risk Management Guidelines (2009) where development is planned in flood risk areas, a detailed flood risk assessment may have to be carried out within the SFRA, so that the potential for development of the lands and their environmental impact can be assessed. Within the process of preparing the Louth Development Plan, the Strategic Environmental Assessment (SEA) report will consider the environmental effects of the Plan against environmental criteria for the Plan area, including mitigation measures and future monitoring of effects.

As with SEA, it will be important to knit flood risk assessment into the development plan structure and provide a coherent and transparent approach as to how it has been considered in making spatial planning decisions.

A summary of the likely effects of the Plan on the environment, through exposing new development and their occupants to potential flood risks and any adverse impacts as a result, will be addressed in the SEA process. A summary will be provided in the environmental report element of the overall Development Plan. The integration of the SFRA with the SEA and wider development plan process is shown in Figure 3.

Figure 3: The integration of the SFRA with the SEA and wider Development Plan process



Source: Planning System and Flood Risk Management

Section 5

5.1 Compilation of Data

There are a number of sources of flood data available for County Louth. These are listed in Table 10 below and are detailed in the sections following thereafter.

Table 10: Flood data available for County Louth

Description	Coverage	Confidence	Used
National Preliminary Flood Risk Assessment (PFRA)	Countywide	Moderate	Yes
Neagh Bann and Eastern Region CFRAM Studies and Flood Risk Management Plans	Annagassan, Ardee, Baltray Blackrock, Carlingford, Drogheda, Dundalk, Greenore, Termonfeckin.	High	Yes
Dunleer Flood Risk Assessment Study and Dunleer Flood Risk Management Plan	Dunleer	High	Yes
Arterial Drainage Benefiting Land Maps	Countywide	Low	
2010 Irish Coastal Protection Strategy Study, Phase 3a - North East Coast	Whole Coastline of County	High	Yes
Regional Flood Risk Appraisal	Eastern & Midland Region	High	Yes
Office of Public Works (OPW) National Flood Hazard Mapping Reports – Listed by settlement (Historic Events including photos, aerial photos and reports) • **Ardee** • **Baltray** • **Blackrock** • **Carlingford** • **Clogherhead** • **Dundalk** • **Dunleer** • **Drogheda** • **Dromiskin**	Countywide (but only for specific sites)	High	Yes
River Basin Management Plans and reports (Neagh Bann and Eastern)			

5.2 National Preliminary Flood Risk Assessment

The Preliminary Flood Risk Assessment (PFRA) was an important first step in determining how flood risk would be assessed and managed in the future; both at County level and nationally. The purpose of the Preliminary Flood Risk Assessment (PFRA) was to identify areas at risk of significant flooding. The PFRA involved:

- Reviewing records of floods that have happened in the past;
- Undertaking analysis to determine which areas might flood in the future, and what the impacts might be; and
- Extensive consultation with each Local Authority, as principal partners in the CFRAM Programme as well as with other Government departments and agencies.

This assessment considered all types of flooding, including that which can occur from rivers, the sea and estuaries, heavy rain, groundwater, the failure of infrastructure and so on. It also considered the impacts flooding can have on people, property, businesses, the environment and cultural assets. Areas where on-site inspections were required to investigate the issues more closely were identified and these investigations formed part of the CFRAM Studies.

The PFRA is only a preliminary assessment, based on available or readily derivable information. Analysis had been undertaken to identify areas prone to flooding and the risks associated with such flooding, but it should be stressed that the PFRAM analysis is purely indicative and undertaken for the purpose of completing the PFRA.

5.3 Neagh Bann and Eastern Region Flood Risk Management Plans

The OPW undertook the National Catchment Flood Risk Assessment and Management (CFRAM) Programme to give a clear and comprehensive picture of flood risk in areas of potentially significant flood risk and to set out how to manage the flood risk effectively and sustainably. The CFRAM Programme included nine settlements in County Louth:

- Dundalk & Blackrock (Neagh Bann Study)
- Drogheda(Eastern Study)
- Carlingford (Neagh Bann Study)
- Greenore (Neagh Bann Study)
- Annagassan(Neagh Bann Study)
- Ardee (Neagh Bann Study)
- Termonfeckin (Neagh Bann Study)
- Baltray (Eastern Study).

The CFRAM Programme produced Fluvial and Coastal Flood Maps for all the settlements which are available to view on www.floodinfo.ie and also led to the development of 28 Flood Risk Management Plans (FRMP's) including the Eastern Region FRMP and the Neagh Bann FRMP. These FRMP's set out the proposed measures, both structural and non-structural, to manage flood risk and were approved by the Minister for Public Expenditure and Reform in 2018.

5.4 Dunleer Flood Risk Management Plan

Dunleer was subject to a significant flood event in November 2014 when up to 17 commercial and residential properties were affected by flooding from the White River. The town of Dunleer was not identified through the North Western – Neagh Bann Catchment Flood Risk Assessment and Management (CFRAM) Study as an Area for Further Assessment of the Preliminary Flood Risk Assessment (PFRA) as being at potentially significant risk of flooding. At the time of the PFRA (2011) there was no recorded significant history of flooding to properties in the town and a national high level predictive analysis did not establish that the town was at significant risk.

This Dunleer Flood Risk Management Plan (FRMP) represented a continuation from the Dunleer Flood Risk Assessment (FRA) Study carried out by Louth County Council and delivered in November 2016. The 2016 Study included survey, hydrological analysis, hydraulic modelling and mapping in order to identify the level of fluvial flood hazard in Dunleer. Mapping produced identified the flood extent and depth for a range of event frequencies from 50% AEP (2 year return period) to 0.1% AEP (1000 year return period) for the present day and two climate and catchment change scenarios; the Mid-Range and High End Future Scenarios. The analysis is summarised in the report Dunleer Flood Risk Assessment (FRA) Study.

The Dunleer FRMP included a review and analysis of Dunleer FRA Study and the development of potentially viable flood relief works in Dunleer that suitably protect those properties at risk from Fluvial Flooding.

5.5 Arterial Drainage Benefiting Land Maps

The Benefiting Land Maps show land which would or have benefited from a land drainage scheme. This is not based on a “design flood”, (i.e. the events do not have a return period), but indicate low-lying poorly drained land. It is not the same as lands, which are protected by a flood relief scheme. The Benefiting Land Maps may be superseded by the PFRAM and CFRAM Studies, although they may be used to cross check Flood Zones particularly in the River Dee and River Glyde catchments.

5.6 Irish Coastal Protection Strategy Study 2013

The Irish Coastal Protection Strategy Study (ICPSS) is a national study that was commissioned in 2003 with the objective of providing information to support decision making about how best to manage risks associated with coastal flooding and coastal erosion. The Study was completed in 2013 and provides strategic current scenario and future scenario (up to 2100) coastal flood hazard maps and strategic coastal erosion maps for the national coastline.

This major study provides invaluable and essential information required to inform policy in this area, particularly for local authorities in relation to the proper planning and sustainable development of coastal areas. County Louth was examined under Phase 3 of the study (North East and South Coast).

The ICPSS is considered to be one of the more robust studies carried out to date into flooding potential and is invaluable in relation to County Louth given the County’s extensive coastline.

5.7 EMRA Regional Flood Risk Appraisal Report for the RSES

The RSES for the Eastern and Midland Regional Assembly included a Regional Flood Risk Appraisal report, undertaken at a high level, but with a view to informing policy decisions within lower tier development plans.

Table 11 identifies the towns in County Louth which are specifically designated in the Settlement Hierarchy of the RSES.

Table 11: RSES Settlement Hierarchy for Louth

Settlement Hierarchy RSES	Location
Regional Growth Centre	Drogheda
Regional Growth Centre	Dundalk

Regional Growth Centre - Drogheda

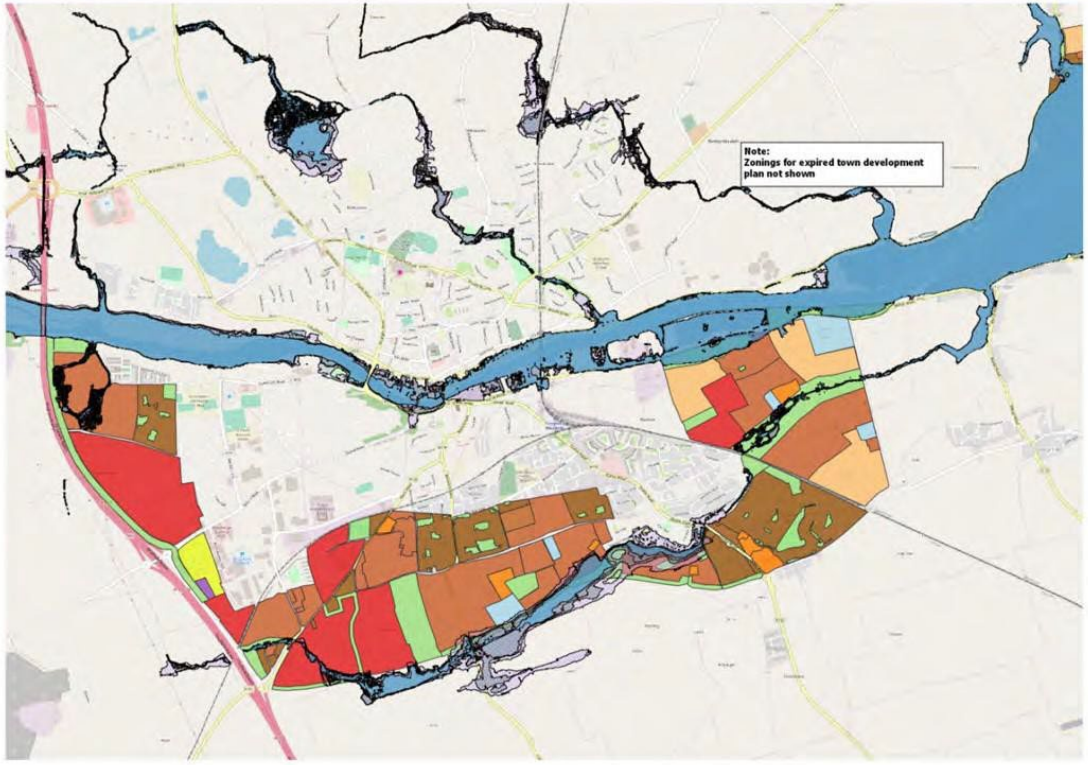


Figure 4 – Broad spatial distribution of flood risk in Drogheda

Flood Zone Mapping	**CFRAM Flood Zone mapping**
Commentary	Drogheda sits at the mouth of the River Boyne, discharging into the Irish Sea. Aerial photography would indicate thetown will expand tothe north and south. There is partial flooding in these areas and theprinciple of avoidance should be implemented toavoidfloodrisk areas. Fluvial and tidal floodingfrom thebanks ofthe River Boyne affects thequays ofthetown aswellaspartiallypropagating inland in areas between St. Marys Bridge and St. Dominick's Bridge forhigher return periods.Developmentinthisareashouldfollowthesequentialapproachandappropriatelandusetypesadopted.

RPO – Regeneration of Westgate	Sectionsoftheexisting Westgatearea zoned for futureregenerationare inundatedwithin thepredicted Flood Zone Aand B extents. The low lying areas adjacent to the bank of the River Boyne are the worst affected. Development and regenerationinthisareashould be carried outin accordance withthe Guidelines, specifically circular PL02/2014 (August 2014). Thecircularspecificallyaddresses regenerationareas andfloodriskmanagementoftheirdevelopment. Thesites identifiedcan becognisant oftheprogression andimplementationoftheDroghedaFlood Alleviation Scheme asidentified asa measure in the FRMP. The scheme couldprotect parts of thetown centreforthe 1% AEP event.
RPO– Regeneration oflands at McBride Station	Thepredicted Flood Zone A& Bextents encroaches onthe land betweenthe River Boyne and the Marsh Road zoned for futureemploymentuse.TheextentofthefloodingislimitedtothelandsnorthofMarsh RoadanddoesnotextendtothetheremaininglandzonedadjacenttoMcBrideStationforfutureemploymentandresidentialusesouthofMarshRoad.An open space areahas been zoned to maintain thefloodplain along the Silverstream watercourse.
RPO – Drogheda Docklands and Port	The lands within Drogheda Docklands and Port zoned forfuture expansionsarewithin thepredicted Flood Zone A and B extents. Water compatible development is appropriate in this area. However, flood risk assessments for development of theportshouldstillbecarriedouttoensurethatthereisnoresidualfloodrisktothesurroundingsareas(upstreamand downstream) due to development on these floodplains.
RPO–Regenerationand redevelopmentof areasnear Mell/ North Roadandthe town centre	ThereisnopredictedfluvialorcoastalfloodingintheMell/North Roadareasandregenerationoftheseshouldnotbe hinderedfromafloodriskperspective. Theexisting mixeduse developmentslocatedonlowlyinglands within Drogheda town centre from Wellington Quay to West Street are inundated with the predicted Flood Zone A and B extents. Development and regeneration in this area should be carried out in accordance with the Guidelines specifically circular PL02/2014 (August 2014).
RPO: Support the proposed Drogheda Flood Relief Scheme	This will aid in protecting existing development and reduce the flood risk. It will also enable further sustainable development of at risk undeveloped land.
Existing - Flood Risk Management Measures	No current existing flood risk management measures.

Proposed- Flood Risk Management Measures	Flooddefencemeasureswereproposedfor Drogheda, aspartofthe OPWFRMPforthe BoyneCatchment,toprovide protection for up toa 1 in 100 year fluvial event and also a 1 in 200 year coastal event. The floodrelief works proposed for Drogheda includeaseries ofharddefences alongthe River Boyneandimprovement of conveyance and a flowdiversionchannelonvarioustributaries. There may be some sealingofmanholes, localised raising of roads and automated defences to allow continued operation of port activities. The hard defences consist of an average height of 1.95m and a total length of 4.3km. The improvement of channel conveyance consists of 215m of additional 1.5m diameter twin culvert within the vicinity of the old Usher's Mill at Greenhills and 91m of dredged and widened channel. The FRMP outlined that a detailed study is required to investigate non-fluvial flooding sources in the vicinity of a proposed development.
Flood Risk Summary	**Existing Flood Risk** The CFRAM study provides thebest source ofexistingfluvial and coastal floodinginformation for Drogheda. This mapping is presentedinFigure4.Thisdoesnotprovideacompleteassessmentoffloodrisktotheareanordoesitassessflood risk fromall sources. Thismust be covered inthe SFRA informing the LAPand FRAs for any otherdevelopment plansinthe town. **Flood Risk Impact and Spatial Planning Integration** The areas within lands zoned for future residential and employment use identifiedwithin the predicted Flood Zone A & B require site specific flood risk assessments to ensure no adverse flood risk impacts. Existing residential and mixed use developmentsatDroghedatowncentrezonedforfutureregenerationlocatedwithinthepredicted FloodZoneA&B require flood risk management to ensure flood risk is mitigated and does not have an adverse impact elsewhere. Applications for major developmentwithinthesareas requireasitespecificfloodrisk assessment toensure no increase in flood risk to the development and surrounding areas. FRAs should be carried out in accordance with the Guidelines and the sequential approach forthesesites to be developed in a sustainable manner and avoid floodrisk. An assessment of climate and catchment changes shows Drogheda to be vulnerable to the increases as modelled in the mid-range and high end future scenarios. Futuredevelopmentplansandfloodriskassessments shouldconsiderthe potentialofclimatechange influence on flood extents in accordance with the Guidelines.

	Recommendations For Flood Risk Management As detailed above the CFRAM FRMP has outlined a flood alleviation scheme for the town that should be reviewed bythe planning authorities in conjunction with the OPW to deliver a flood alleviation scheme if it is deemed appropriate and viable. The planning authority should also review and implement where appropriate the suggested CFRAMflood risk management policy measures as outlined in Appendix B and the FRMP. SFRAs should be undertaken for all development plans and existing SFRAs should be updated and reviewed in line with statutory timelines for development plans. An assessment of climate and catchment changes shows Drogheda to be vulnerable to the increases as modelled in the mid- range and high end future scenarios. The proposed flood alleviation scheme should be designed to incorporate the potential impacts of climate change or be adaptable to increase the height of defences to provide the required standard of protection (or other measures including Natural Flood Risk Management Measures may be adopted to monitor and/or adapt the scheme). **Opportunities for Joint Studies** Meath and Louth County Councils should collaborate on future SFRAs for the Drogheda area to ensure that all floodriskissues are captured to inform their preparation of spatial plans.

Regional Growth Centre – Dundalk

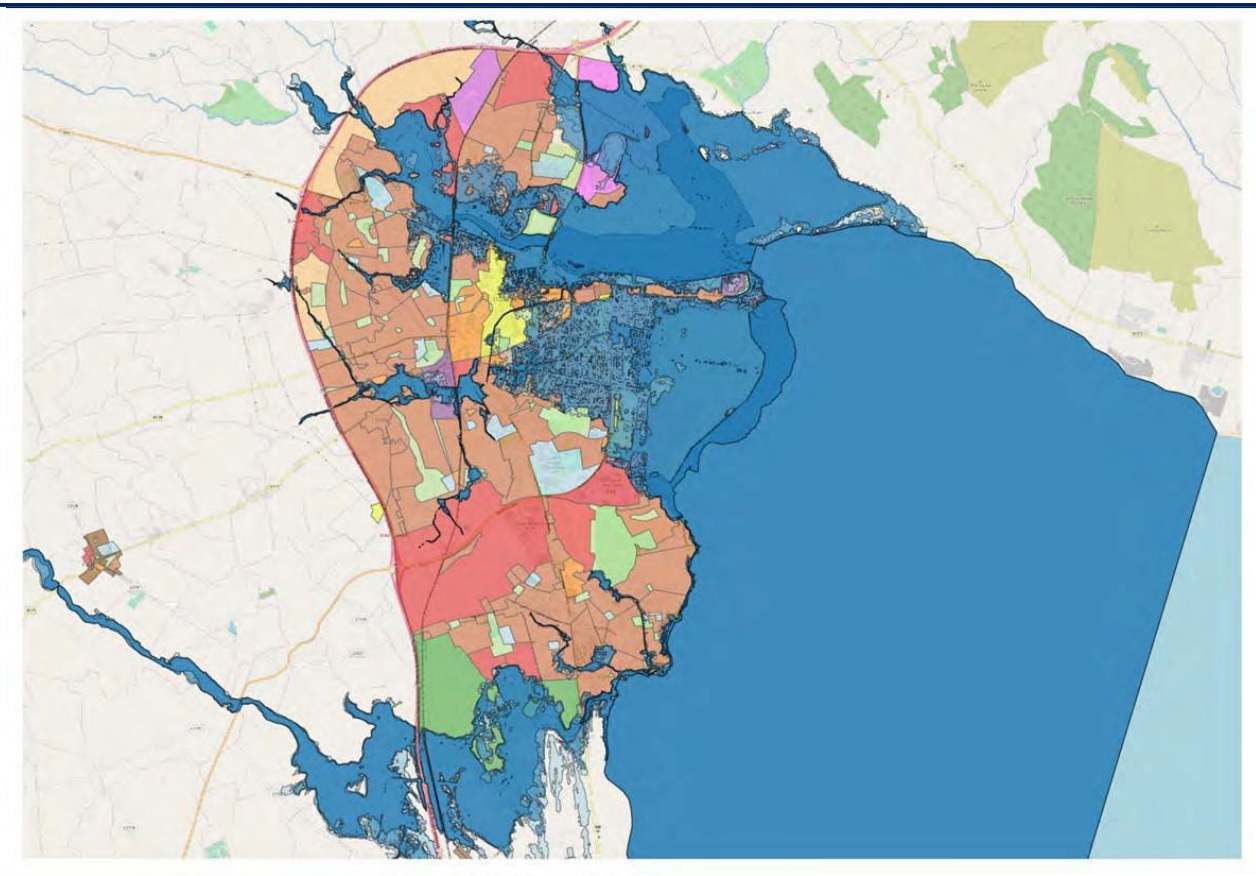


Figure 5 Broad spatial distribution of flood risk in Dundalk

Flood Zone Mapping	CFRAM Flood Zone mapping
Commentary	Dundalk town centre is susceptible to fluvial flooding along the Castletown River but also from tidal flooding propagating inland from the Irish Sea. The Cooley Mountains to the north of the town and hilly terrain to the west with the Irish Sea to the east have resulted in the town growing southward towards the village of Blackrock. The M1 circumnavigates the town which will consolidate growth to the south of the town centre. The extent of the CFRAM mapping would indicate that the growth of Dundalk will largely be comprised of infill development between the boundary of the existing town and the M1.
RPO – Town Centre Regeneration	Current Scenario flooding is not a significant risk to the regeneration of the town centre areas such as Clanbrassil Street / St. Nicholas Quarter and infill/brownfield sites including Long Walk Shopping Centre, Carroll Village Shopping Centre, Williamson's Mall, and the former Dunne Stores premises, Park Street. However, there is some potential for climate change influences to expand flood extents towards Clanbrassil Street and Seatown Place. Development and regeneration in this area should be carried out in accordance with the Guidelines specifically circular PL02/2014 (August 2014).
RPO – Regeneration of Port Harbour	The land within the Port area zoned for future expansion is within the predicted Flood Zone A and B extents. Water compatible development is appropriate in this area. However, flood risk assessments for development in the port should still be carried out to ensure that there is no residual flood risk to the surroundings areas (upstream and downstream) due to development on these floodplains.
RPO – Development of Mount Avenue Masterplan Lands	Some lands within the Mount Avenue Masterplan area are inundated with Flood Zone A and B. As the development area is currently largely greenfield, the sequential approach of the Guidelines should be applied to ensure sustainable growth of Dundalk.
RPO – Identification of suitable sites for industry to support Dublin-Belfast Economic Corridor	Several greenfield sites identified for industrial expansion on the periphery of the town have Flood Zone A and B extents. Any development in these areas should include a site-specific FRA and follow the Guidelines sequential approach.
RPO: Support the proposed Dundalk Flood Relief Scheme	This will aid in protecting existing development and reduce the flood risk. It will also enable further sustainable development of at risk undeveloped land.

Existing - Flood Risk Management Measures	There are embankments protecting parts of the Point Road but they are only effective up to the 10% AEP coastal event. Louth County Council is also progressing with the extension of an existing 1350mm surface drainagepipe as aninterim floodrelief method in the Balmers Bogarea. Thepipe willprovide additional flow capacity which maybesignificant during high frequency events and affords partial upstream flood mitigation during a 1% AEP event, however alternative FRM methods would still be required to provide the preferred SoP under CFRAM for Dundalk AFA.
Existing Residential Areas	There is afluvial flood riskto existingresidential areas in the Upper and Lower Marshes areas aswellasthe Demesne area. There is a coastal flooding risk to St. Marys, Seatown and to large extents of the eastern part of the town between St. Alphonsus Road and Red Barns Road. Applications for minor development to these existing buildings in areas of flood risk such as small extensions and most changes of uses must include a flood risk assessment of appropriate detail to demonstrate that they would not have adverse flood risk impacts and employ flood resilient construction. Large scale developments for regeneration or infill development for these areas will require a site-specific FRA.
Proposed - Flood Risk Management Measures	Flood defences measures were proposed for Dundalk and Blackrock South AFA, as part of the OPW FRMP to provide protection for up to a 1 in 100 year fluvial event and also a 1 in 200 year coastal event. Two proposed measures were identified that could be implemented after project-level assessment and planning. The preferred solutions are alternate routes for hard defences, combined with improvement of channel conveyance, which would provide the required standard of protection.
	Both measures consists of a series of hard defences, including flood embankments and walls, rock armour coastal protection, demountable barriers, road raising, a sluice gate and tanking of two properties. These defences would be required along with improvement of channel conveyance on the Blackrock River and Dundalk Blackwater River, along with storage on the Castletown River. The conveyance requires a 430m length of the Blackrock River to be lowered, along with the replacement of two undersized culverts. On the Dundalk Blackwater, two undersized parallel culverts should be replaced. The storage area to be created is located upstream of the Castletown River, allowing a volume of 84,329m3 to be stored during the 1% AEP fluvial flood event. This requires a short 15m embankment, along with a culvert and weir in order to retain flow at the 10% AEP event. The two proposed measures have alternate routes with hard defences either following theexistinglineof coastal embankments protecting allproperties oranewlineofcoastaldefences set

	back.
Climate Change Adaptability	Dundalk and Blackrock South AFA is considered to be at high vulnerability from the mid-range and high end future scenarios. This should be reflected in the future development plans for the town. A large portion of the eastern edge of the town is susceptible to future coastal flooding if climate change predictions are accurate. Areas from the Avenue Road to the coastline have the potential to be inundated in Flood Zone A and B. The CFRAM FRMP outlined that any proposed flood risk management proposals for the Dundalk and Blackrock South AFA should be adaptable to climate change. The hard defence's method could be adapted by increasing the height of the walls, embankments, demountables and risingroads. Existing defences would need to be altered, with rock armour wideningand sea walls requiring additional length. Additional lengths of hard defences would also be required whereproperties arenot presentlyat risk. A sluicewouldneed to be replaced. The storage area does not have any more capacity to store water for future scenarios. The improvement of channel conveyance method could be adapted by increasing channel capacity size and upgrading culverts. Other measures including Natural Flood Risk Management Measures may be adopted to monitor and/or adapt the scheme.

Flood Risk Summary	**Existing Flood Risk** The CFRAM study provides the best source of existing fluvial and coastal flooding information for Dundalk. This mapping is presented in **Figure 5**. This does not provide a complete assessment of flood risk to the area nor does it assess flood risk from all sources. This must be covered in the SFRA informing the LAP and FRAs for anyotherdevelopmentplansin the town. **Flood Risk Impact and Spatial Planning Integration** The areas within lands zoned future residential and employment hubs identified within the predicted Flood Zone A & B require site-specific flood risk assessments to ensure no adverse flood risk impacts. The Justification Test applies to applications within these areas. Existing residential and mixed use developments at Dundalk town centre zoned for future regeneration located within the predicted Flood Zone A & B requires flood risk management to ensure flood risk is mitigated and does not have an adverse impact elsewhere.

	Applications for major development within these areas required a site-specific flood risk assessment to ensure no increase in flood risk to the development and surrounding areas. FRAs should be carried out in accordance withthe Guidelinesandthe sequentialapproach forthesesitestobe developedinasustainable manner and avoid flood risk. An assessment of climate and catchment changes shows Dundalk has been identified as beingparticularlysusceptibletofloodingfromclimatechangescenarios. Future land use planning for the town should incorporate this into their FRA and development policies. Future development plans and flood risk assessments should consider the potential of climate change influence on flood extents in accordancewith the Guidelines. **Recommendations For Flood Risk Management** As detailed above, the CFRAM FRMP has outlined a flood alleviation scheme for the town that should be reviewedbythe planning authorities in conjunction with the OPW to deliver a flood alleviation scheme if it is deemed appropriate and viable. The planning authority should also review and implement where appropriate the suggested CFRAM flood risk management policy measures as outlined in Appendix B and the FRMP. SFRAs should be undertaken for all development plans and existing SFRAs should be updated and reviewed in line with statutory timelines for development plans. An assessment of climate and catchment changes shows Dundalk has been identified as being particularly susceptible to flooding from climate change scenarios. The proposed flood alleviation scheme should be designed to incorporate the potential impacts of climate change or be adaptable to increase the height of defences to provide the required SoP, or other measures including Natural Flood Risk Management Measures may be adopted to monitor and/or adapt the scheme. **Opportunities for Joint Studies** N/A

Table 12: Reports extracted from Office of Public Works, National Flood Hazard Mapping Application (www.floodmaps.ie), County Louth

Settlement	Date of Flood	Location/Description Synopsis
Ardee	November 1968	River Dee downstream of Ardee lasting up to two days
Ardee	17th August 2008	Prolonged rainfall in the River Dee catchment led to extensive flooding in the area around Ardee Bog including local roads. The floods persisted for some time.
Ardee	30th December 2015	The ground floor of Riverside Apartment block and the junction of John Street and Stoney Lane were flooded when the adjacent stream flowing down Stoney Lane overflowed.
Ardee Area	1st December 2015	Aclint & Reaghstown Townlands - fields flooded for 1 month; Ardee Bog - fields flooded for 1 month; Corbollis & Mapastown Townlands - fields flooded for 1 month. All due to the overtopping of the River Glyde.
Baltray	02nd November 2000	Major coastal flooding incident in residential area.
Blackrock	07th March 2001	Localised flooding of small river flowing through part of Rock Court caused by heavy rainfall.
Blackrock	February 2002	Blackrock Promenade. High tide severely flooded this area. Houses along main Street were damaged. Also badly affected Village Green/Golf Links Road and Wallace Road/Rock Road junction.
Blackrock	3rd January 2014	Flooding caused due to high tides and surge raising water levels and together with significant wave heights resulted in sea wall along Main Street Blackrock being overtopped causing flooding of street and adjacent retail properties on the 3rd, 5th and 7th of Jan 2014.
Carlingford	1995	Market Street, flooding of public house due to flash flood. Grove Road, Carlingford. Road closed due to flooding caused by runoff from adjacent lands following prolonged, heavy periods of rain.
Carlingford	3rd January 2014	A combination of high tide, low air pressure and wind direction caused flooding at the Snooker/Pool Hall and Old Quay Lane.
Clogherhead	02nd November 2000	Flooding at Port Oriel Caravan Park
Drogheda	17th October 2012	Reports of tidal flooding of road and houses along Ship Street & Marsh Road and of Wellington Quay, Marsh Rd, Queensboro (Baltray Rd).

Settlement	Date of Flood	Location/Description Synopsis
Drogheda	03rd January 2014	Extensive flooding caused by overtopping of the River Boyne due to tidal surge, low air pressure and wind direction. 100 residential properties, 62 commercial properties, several roads including access to Railway Station car park and Waste Water Treatment Plant all flooded. The flood occurred twice on the 3rd and 6th of January.
Drogheda	14th November 2014	Overtopping at culvert inlet at top of Flaxmill Lane caused flooded of four ground floor apartments at Flaxmill Lane Apartments.
Dundalk	02nd November 2000	Fatima (North West Dundalk) Major flooding incident in residential area. Mounthamilton, Ardee Road (West Dundalk) major flooding incident in residential area. Dundalk Brewery, flooding of commercial premises
Dundalk	14th November 2014	Rampart River broke its banks causing flooding of four industrial units in Mounthamilton Industrial Estate and three residential properties along Ardee Road. Two properties along Regan's Terrace also flooded.
Gallstown	14th November 2014	Overtopping at bridge on the L2254 in Gallstown flooding two residential properties along the L2254.
Termonfeckin	14th November 2014	Termonfeckin River breached its banks at the Riverside Pub and then also overtopped its banks along the Strand Road. Three residential properties along Strand Road and one pub flooded.
Dunleer	14th November 2014	17 No. Properties affected when the White River burst its banks at the Barn Road & Lower Main Street after flash flooding.
Coole and Townparks Townlands	December 2015	Significant area of land flooded in Ardee Bog.
Corbollis & Mapastown Townlands	December 2015	Significant area of land flooded.
Aclint & Reaghstown Townlands	December 2015	Significant area of land flooded.
Dundalk	2nd September 2020	Flooding occurred at Hardy's Lane Dundalk in close proximity to 6 No, properties.
Dundalk	13th January 2020	Flooding occurred at high tide at 1300hrs following surge from Storm Brendan in Fairgreen & Newry Road.
Drogheda	13th January 2020	Flooding occurred at high tide at 1300hrs following surge from Storm Brendan in Donore's Green, North Strand, Ship Street & Wellington Quay.

5.6 Sources of Flooding

This SFRA has reviewed flood risk from fluvial, coastal/estuarine, pluvial and groundwater sources. It also considers flooding from drainage systems, reservoirs and other artificial or man-made systems. The focus of the study is on risk from fluvial and tidal (coastal/estuarine) flooding. There are two main reasons for this decision. Firstly, the review of historical flooding shows these to be the most common, and most damaging, sources of flooding. Secondly, Flood Zones in The Planning System and Flood Risk Management Guidelines for Planning Authorities are defined on the basis of fluvial, and where appropriate, tidal flood risk. In addition, the SFRA should be based on readily derivable information, and records and indicators for fluvial and coastal flood risk are generally more abundant than for other sources of flooding. With climate change, the frequency, pattern and severity of flooding are expected to change and become more damaging so the likely impact of climate change on fluvial and coastal flood extents has also been appraised.

5.6.1 Fluvial Flooding

Flooding of watercourses is associated with the exceedance of channel capacity during higher flows. The process of flooding on watercourses depends on a number of characteristics associated with the catchment including; geographical location and variation in rainfall, steepness of the channel and surrounding floodplain and infiltration and rate of runoff associated with urban and rural catchments. Generally, there are two main types of catchments: large and relatively flat or small and steep. The two give very different responses during large rainfall events.

In a large, relatively flat catchment, flood levels will rise slowly and natural floodplains may remain flooded for several days, acting as the natural regulator of the flow. In small, steep catchments, local intense rainfall can result in the rapid onset of deep and fast-flowing flooding with little warning. Such “flash” flooding, which may only last a few hours, can cause considerable damage and possible threat to life.

The form of the floodplain, either natural or urbanised, can influence flooding along watercourses. The location of buildings and roads can significantly influence flood depths and velocities by altering flow directions and reducing the volume of storage within the floodplain. Critical structures such as bridges and culverts can also significantly reduce capacity, creating pinch points within the floodplain. These structures are also vulnerable to blockage by natural debris within the channel or by fly tipping and waste.

Flood risk to specific settlements has been used to inform the zoning objectives for the towns and villages. Outside the zoned settlements, there is the potential for developments, which must also be allocated according to the principles of The Planning System and Flood Risk Management Guidelines Where development is proposed within Flood Zones A or B, the Justification Test must be applied, and passed.

5.6.2 Coastal Estuarine Flooding

Coastal flooding is caused by higher sea levels than normal, largely as a result of storm surges, resulting in the sea overflowing onto the land.

Coastal flooding is influenced by the following three factors, which often work in combination:

- High tide level;
- Storm surges caused by low barometric pressure exacerbated by high winds (the highest surges can develop from hurricanes);
- Wave action, which is dependent on wind speed and direction, local topography and exposure.

Estuarial flooding may occur due to a combination of tidal and fluvial flood mechanisms, i.e. interaction between rivers and the sea, with tide levels being dominant in most cases. A combination of high flow in rivers and a high tide will prevent water flowing out to sea, causing increase in water levels inland, which may flood over river banks.

Significant tracts of coastal lands in Louth are considered to be at risk from flooding, as are areas adjacent to rivers and streams. Some areas located upstream of constrained open channels where streams have been culverted or outfalls tide locked, may be at risk of flooding. Equally, development of these areas may also pose a significant risk to downstream lands. Both Drogheda and Dundalk are at risk of Coastal / Estuarine Flooding with inundation occurring, most notably in 2014.

Coastal erosion of the foreshore and the shoreline is intimately linked with coastal flooding. The loss of natural coastal defences, such as sand, due to erosion (or mechanical removal of sand) can increase the risk of flooding in coastal areas.

The Guidelines state that coastal erosion should, therefore, be considered in coastal areas within the planning process.

5.6.3 Pluvial Flooding

Flooding of land from surface water runoff is usually caused by intense rainfall that may only last a few hours. The resulting water follows natural valley lines, creating flow paths along roads, through and around developments and ponding in low spots, which often coincide with fluvial floodplains in low lying areas. Any areas at risk from fluvial flooding will almost certainly be at risk from surface water flooding. SFRAs require a strategic assessment of the likelihood of surface water flooding for which overland routing is suitable and appropriate. This includes consideration of the following:

- Are there zoned lands which may need to accommodate and retain surface water flow routes?
- Are there zoned lands which might discharge upstream of an area vulnerable to surface water flooding?

Whilst the potential for surface water flow paths or ponding should not necessarily impede or restrict development, applications in such areas need to consider drainage thoroughly so as to ensure risks do not increase in the future. A detailed drainage assessment should be undertaken for specific applications.

5.6.4 Groundwater Flooding

Groundwater flooding is caused by the emergence of water originating from underground and is particularly common in karst landscapes, which are prevalent in the Cooley Peninsula area of County Louth. This can emerge from either point or diffuse locations.

The occurrence of groundwater flooding is usually very local and unlike flooding from rivers and the sea, does not generally pose a significant risk to life due to the slow rate at which the water level rises. However, groundwater flooding can cause significant damage to property, especially in urban areas and pose further risks to the environment and ground stability. Groundwater flooding can persist over a number of weeks and poses a significant but localised issue that has attracted an increasing amount of public concern in recent years. In most cases groundwater flooding cannot be easily managed or lasting solutions engineered, although the impact on buildings can be mitigated through various measures.

5.6.5 Flooding from Drainage Systems

Flooding from artificial drainage systems occurs when flow entering a system, such as an urban storm water drainage system, exceeds its discharge capacity, in that it becomes blocked or it cannot discharge due to a high water level in the receiving watercourse. Flooding in urban areas can also be attributed to sewers.

Sewers have a finite capacity, which, during certain load conditions will be exceeded. In addition, design standards vary and changes within the catchment areas draining to the system, in particular planned growth and urban creep will reduce the level of service provided by the asset. Sewer flooding problems will often be associated with regularly occurring storm events during, which sewers and associated infrastructure can become blocked or fail. This problem is exacerbated in areas with under-capacity systems. In the larger events that are less frequent but have a higher consequence, surface water will exceed the capacity of the sewer system and flow across the surface of the land, often following the same flow paths and ponding in the same areas as overland flow. Foul sewers and surface water drainage systems are spread extensively across the urban areas with various interconnected systems discharging to treatment works and into local watercourses.

There are limited records of flooding from drainage systems in Louth. Whilst information on such incidents can give an idea of those areas with limited drainage capacity, it is only a record of the hydraulic inadequacies of the sewer systems, not properties at risk of flooding. Therefore, it has limiting usefulness in predicting future flooding.

5.6.6 Flooding from Reservoirs and other Artificial Sources

Reservoirs can be a major source of flood risk, as demonstrated in the 2009 flooding event, when waters from the Inniscarra dam flooded significant sections of Cork. Whilst the probability of dam failure or breach occurring is very small, the consequences of such an event can be devastating thereby presenting a risk of flooding which has to be considered.

Water supply to County Louth comes in two forms. Much of the north of the County including Dundalk receives water from Lough Muckno in County Monaghan via the Cavan Hill treatment plant, whilst parts of the south of the County, including Drogheda is supplied from the River Boyne in County Meath via the Staleen treatment plant. This supply is augmented by small reservoirs, north of Drogheda in the Balgatheran area. These sources of water supply are augmented by additional abstraction from the Rivers Dee, Glyde, Lislea, Fane and Mattock and from boreholes across the County. As such, there are no major artificial water bodies such as large reservoirs or canals which could contribute to flood risk if overwhelmed.

5.7 Flooding Impacts

Flood impacts may be direct or indirect, immediate or long term and may affect households, communities and individuals as well as the environment, infrastructure and economy of an area.

In the following sections the impacts of flooding to people, property, infrastructure and the environment is discussed and assessed in the context of County Louth.

5.7.1 Flooding Impacts on People

Flooding has a wide range of social impacts which may be difficult to delineate as they are interconnected, cumulative and often not quantifiable.

In small urban or steep upland catchments which have a very rapid response to rainfall, or with flooding due to infrastructure failure, flood waters can rise very quickly and put life at risk. Even shallow water flowing at 2m/s can knock children and many adults off their feet and vehicles can be moved by water of 300mm depth. The risks rise if the flood water is carrying debris.

The impact on people as a result of the stress and trauma of being flooded or even of being under the threat of flooding, can be immense.

Long-term impacts can arise due to chronic illnesses and stress. Flood water contaminated by sewage or other pollutants (e.g. chemicals stored in garages or commercial properties) is particularly likely to cause such illnesses, either directly as a result of contact with the polluted flood water or indirectly as a result of sediments left behind.

The degree to which populations are at risk from flooding is not solely dependent upon proximity to the source of the threat or the physical nature of the flooding. Social factors also play a significant role in determining risk.

Although people may experience the same flood, in the same area, at the same time, their levels of suffering are likely to differ greatly as a result of basic social differences. These differences will affect vulnerability in a variety of ways, including an individual or community's response to risk communication (flood warning) and physical and psychological recovery in the aftermath of a flood.

How individuals and communities experience the impact will also vary depending on their awareness of the risk of flooding, preparedness for the flood event and the existence or lack of coping strategies.

Impacts of flooding on people are difficult to measure and quantify. There is currently no spatially referenced dataset of social vulnerability, although, in time, the Census could be adapted into the format of the Social Flood Vulnerability Index, as used in the UK.

5.7.2 Flooding Impacts on Property and Infrastructure

Flooding can cause severe property damage. Flood water is likely to damage internal finishes, contents, electrical and other services and possibly cause structural damage. The physical effects can have significant long-term impacts, with re-occupation sometimes not possible for over a year. The costs of flooding are increasing, partly due to increasing amounts of electrical and other sophisticated equipment within developments.

The damage flooding can cause to businesses and infrastructure, such as transport or utilities like electricity and water supply, can have significant detrimental impacts on local and regional economies.

The long term closure of businesses, for example, can lead to job losses and other economic impact.

The vulnerability of buildings is important to understand in terms of their occupants and their type. For example, it is much more difficult to evacuate the elderly and ill from hospitals and care homes than people working in offices or industrial areas. Building types that need to be operational during and post-flood, such as ambulance stations and emergency response centres are also vulnerable if the services they provide are disrupted by flooding, placing the immediate community at greater risk. Transport and strategic utilities infrastructure can be particularly vulnerable to flooding because interruption to their function can have widespread effects well beyond the area of flooding. For example, flooding of primary roads or railways can deny access to areas for the duration of the flooding, as well as causing damage to the road or railway. Flooding of water distribution infrastructure, such as pumping stations, or of electricity sub-stations can result in loss of water or power over large areas. This can magnify the impact of flooding beyond the immediate community and reinforces why decisions to locate development in floodplain should be taken very carefully.

Placing new development or regenerating in flood risk areas has additional short and long term costs. The need to build resistant and resilient properties could significantly increase overall costs of development, whilst ongoing maintenance and insurance increase future expenditure.

5.7.3 Flooding Impacts on the Environment

Environmental impacts can be significant and include soil erosion, bank erosion, land sliding and damage to vegetation as well as the impacts on water quality, habitats and flora and fauna caused by bacteria and other pollutants carried by floodwater.

Flooding can have a beneficial role in natural habitats. Many wetland habitats are dependent on annual flooding for their sustainability and can contribute to the storing of flood waters to reduce flood risk elsewhere. It is important to recognise the value of maintenance or restoration of natural riparian zones such as grasslands, which protect the soils from erosion and 'natural' meadows which can tolerate flood inundation. The use of green infrastructure throughout the river centre can also play a vital role in enhancing the river environment as well as safeguarding land from future development, protecting people and buildings from flooding and reducing flood risk downstream.

A natural floodplain can help accommodate climate change and improve the quality of rivers and associated wetlands to help achieve good status by 2015 under the Water Framework Directive. Meeting WFD objectives involves not only ecosystems, water quality, drought and flood impact considerations but also the physical characteristics and morphology of the river channel, floodplain and associated structures.

In County Louth, Carlingford Shore SAC, Dundalk Bay SAC and Boyne Coast and Estuary SAC all lie within PFRA modelled Flood Zones A and B. Furthermore, Carlingford Lough SPA, Dundalk Bay SPA and Boyne Estuary SPA lie within the same zones.

Development in the designated sites will be constrained by the SAC and SPA objectives but would also be required to pass the Justification Test if proposed in the vicinity of the watercourses.

5.8 Climate Change

The Planning System and Flood Risk Management Guidelines for Planning Authorities recommend that a precautionary approach to climate change is adopted due to the level of uncertainty involved in the potential effects. A significant amount of research into climate change has been undertaken at both a National and International level. This section will briefly examine some of the key findings of the research to date.

The Intergovernmental Panel on Climate Change (IPCC) was established in 1988 and its first report in 1990 justified concern about the effects of climate change on a scientific basis.

The more recent IPCC Fourth Assessment Report 2007 concludes that climate change is unequivocal. It projects a global average sea level rise of between 0.18m and 0.59m for different emissions scenarios, up to the end of the century.

More specific advice on the expected impacts of climate change and the allowances to be provided for future flood risk management in Ireland is given in the OPW guidance.

Two climate change scenarios are considered. These are the Mid-Range Future Scenario (MRFS) and the High-End Future Scenario (HEFS). The MRFS is intended to represent a "likely" future scenario based on the wide range of future predictions available. The HEFS represents a more "extreme" future scenario at the upper boundaries of future projections. Based on these two scenarios the OPW recommends allowances for climate change as detailed in Table 13.

Table 13: Climate Change Scenarios

Criteria	Mid-Range Future Scenario (MRFS)	High-End Future Scenario (HEFS)
Extreme Rainfall Depths	+20%	+30%
Flood Flows	+20%	+30%
Mean Sea Level Rise	+500mm	+1,000mm
Land Movement	-0.5mm per year Note; Applicable to southern part of Country only i.e.; Dublin to Galway and south of this line	-0.5mm per year Note; Applicable to southern part of Country only i.e.; Dublin to Galway and south of this line
Urbanisation	No general allowance – Review on a case by case basis	No general allowance – Review on a case by case basis
Forestation	-1/6 TP	-1/3 TP

5.8.1 Climate Change and Flood Risk Assessment

The Flood Zones are determined based on readily available information and their purpose is to be used as a tool to avoid inappropriate development in areas of flood risk. Where development is proposed, within an area of potential flood risk (Flood Zone A or B), a flood risk assessment of appropriate scale will be required and this assessment must take into account climate change and associated impacts. Under the National CFRAM programme, the detailed modelling and assessment stage of each study will include for climate change effects.

Consideration of climate change is particularly important where flood alleviation measures are proposed as the design standard of the proposal may reduce significantly in future years due to increased rainfall, river flows and sea levels.

As recommended by the Guidelines, a precautionary approach should be adopted. Climate change may result in increased flood extents and therefore caution should be taken when zoning lands in transitional areas. In general, Flood Zone B, which represents the 0.1% AEP extent, can be taken as an indication of the extent of the 1% AEP flood event with climate change. In steep valleys, an increase in water level will relate to a very small increase in extent, however in flatter low-lying basins a small increase in water level can result in a significant increase in flood extent.

In the design of flood alleviation measures, climate change should be taken into account and design levels of structures such as flood walls or embankments, must be sufficient to cope with the effects of climate change over the lifetime of the structure or where circumstances permit, be capable of adaption.

Following the Guidelines, development should always be located in areas of lowest flood risk first and only when it has been established that there are no suitable alternative options should development (of the lowest vulnerability) proceed. In such instances, consideration of suitable flood risk mitigation and management measures is necessary.

It may be technically feasible to mitigate or manage flood risk at site level; however, the potential impacts on the surrounding community must also be considered.

A strategic approach to the management of flood risk is required to consider the impact of flooding on a catchment wide basis.

Section 6

6.1 Management of Flood Risk from a Planning Perspective

The Planning System and Flood Risk Management Guidelines for Planning Authorities (2009) recommend the sequential approach. This works well where there are no constraints to development and there is an ample source of developable land. In some areas, development may be constrained due to its location adjacent to the river and natural flood plain.

Spatial planning objectives for the area must coincide with the overall flood management strategy. Flood risk management policies must allow a sustainable approach to development without increasing exposure to flood risk whilst considering the mitigation and management of flood risk to existing communities.

6.2 Flood Risk Policy Objectives

The policy objectives of the Planning Authority will include consideration of the following:

- The Planning System and Flood Risk Management, Guidelines for Planning Authorities.
- The content of this SFRA; the Flood Zones and their use as a planning tool.
- The Neagh-Bann FRMP and the Eastern FRMP.

6.3 Policy Objectives[1]

Policy No. 1 (IU 26) – To reduce the risk of new development being affected by possible future flooding by:

- Avoiding development in areas at risk of flooding and
- Where development in floodplains cannot be avoided, taking a sequential approach to flood risk management based on avoidance, reduction and mitigation of risk.

Avoid development other than 'water compatible development' in 'Flood Zone A' and avoid 'highly vulnerable development' in 'Flood Zone B' in accordance with Section 3 of The Planning System and Flood Risk Management – Guidelines for Planning Authorities (2009).

Policy No. 2 (IU 27) – To ensure all proposals for development falling within Flood Zones A or B are consistent with The Planning System and Flood Risk Management – Guidelines for Planning Authorities 2009. Proposals for development identified as being vulnerable to flooding must be supported by a Site Specific Flood Risk Assessment and demonstrate, to the satisfaction of the Planning Authority that the development, and its infrastructure, will avoid significant risks of flooding and not exacerbate flooding elsewhere.

In Flood Zone C, where the probability of flooding is low (less than 0.1%), site-specific Flood Risk Assessment may be required and the developer should satisfy themselves that the probability of flooding is appropriate to the development being proposed.

[1]IU reference relates to Policy Objective in Chapter 10, Infrastructure and Public Utilities.

The County Plan SFRA datasets and the most up to date CFRAM Programme climate scenario mapping should be consulted by prospective applicants for developments in this regard and will be made available to lower-tier Development Management processes in the Council.

Applications for development in flood vulnerable zones, including those at risk under the OPW's Mid-Range Future Scenario, shall provide details of structural and non-structural risk management measures, such as those relating to floor levels, internal layout, flood-resilient construction, emergency response planning and access and egress during flood events.

Policy No. 3 (IU 28) – Where a site specific Flood Risk Assessment demonstrates that there are significant residual flood risks to a proposed development or its occupiers in conflict with The Planning System and Flood Risk Management – Guidelines for Planning Authorities 2009, planning permission will normally not be granted unless the requirements of Section 5.28 'Assessment of minor proposals in areas of flood risk' can be satisfied.

Policy No. 4 (IU 29) – To implement the Flood Risk Management Measures as detailed in the Neagh Bann Flood Risk Management Plan, the Eastern Flood Risk Management

Plan and the Dunleer Flood Risk Management Plan ensuring that proposals for development support and do not impede the progression of these measures. Louth County Council will, in partnership with the Office of Public Works (OPW) deliver the following Flood Relief Schemes:

- Dundalk, Blackrock and Ardee;
- Drogheda and Baltray; and
- Carlingford and Greenore.

Policy No. 5 (IU 30) – To work with the Office for Public Works in the development and implementation of catchment-based strategies for the management of flood risk – including those relating to storage and conveyance.

Policy No. 6 (IU 31) – To contribute towards the improvement and/or restoration of the natural flood risk management functions of flood plains subject to compliance with the environmental legislation and availability of resources.

Policy No. 7 (IU 32) – To ensure each flood risk management activity is examined to determine actions required to embed and provide for effective climate change adaptation as set out in the OPW Climate Change Sectoral Adaptation Plan for Flood Risk Management applicable at the time.

Policy No. 8 (IU 33) - Where a portion of a site is at risk of flooding, the lands at risk will be subject to the sequential approach to ensure first and foremost that new development is directed towards lands at low risk of flooding; and to restrict the type of development to that 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines.

Policy No. 9 (IU 34) - To consult with the Office of Public Works (OPW) in relation to proposed developments in the vicinity of drainage channels and rivers for which the OPW are responsible.

Policy No. 10 (IU 35) - To consult with the Office of Public Works (OPW) in relation to proposed developments which include the construction, replacement or alteration of a bridge or culvert and to require that the developers obtain consent from the OPW under Section 50 of the EU (Assessment and Management of Flood Risks) Regulations 2010 and Section 50 of the Arterial Drainage Act 1945, where appropriate.

6.4 Flood Zone Development

As set out in the RSES Regional Flood Risk Appraisal Report, and under the Planning Guidelines, the Flood Zone mapping for the County is principally derived from the CFRAM Studies where possible. However, most settlements in the Louth County Development Plan are not covered by the CFRAM and in this case a range of other datasets, as shown in Table 10 were used as supplementary information to inform this SFRA. Due to recent guidance from OPW regarding the use of the first generation PFRA mapping and the indicative nature of the flood extents, the approach used under the Louth SFRA has been precautionary. All sources of available flood mapping were reviewed in cases where proposed undeveloped lands are zoned for highly or less vulnerable use (where CFRAM Maps are not available). As such, a single dataset of County Flood Zones has not been prepared, but in each settlement specific guidance is provided based on the data review.

6.4.1 STRATEGIC FLOOD RISK ASSESSMENT

When the second generation PFRA mapping is issued to Local Authorities, the data will be used in conjunction with the other available datasets and site visits, to provide a countywide Flood Zone dataset, subject to further verification.

The review of the suite of flood risk data has been developed as a spatial planning tool to guide Louth County Council in making land-use zoning and development management decisions and it is recognised that site specific information may contradict the Flood Zones, either to demonstrate a greater or lesser level of flood risk. However, the data has been deemed appropriate for the planning decisions being made at this stage of the plan making process.

In general, where CFRAM Flood maps are available, flood levels are indicated at selected node points along the watercourse or along the coast. Once an appropriate level of validation has been undertaken as part of the site-specific FRA, these flood levels may be used to form the basis of the development design.

6.4.2 Specific Development Planning Applications

The following outlines the key requirements relating to the management of development in areas at risk of flooding.

All development at potential risk of flooding will require an appropriately detailed Flood Risk Assessment. As a minimum this will include;

- **Stage 1** - Identification of Flood Risk; where flood risk is identified.
- **Stage 2** - Initial FRA will be required and depending on the scale and nature of the risk.
- **Stage 3** - Detailed FRA may be required.

All development proposals, within or incorporating areas at moderate to high flood risk, that are vulnerable to flooding, will require the application of the development management justification test in accordance with Box 5.1 of The Planning System and Flood Risk Management – Guidelines for Planning Authorities 2009.

The Planning Authority will explore opportunities to include flood alleviation proposals and upgrades that benefit the county and/or local area as a whole, as part of specific development applications.

Any proposal that is considered acceptable in principle shall demonstrate the use of the sequential approach in terms of the site layout and design and, in satisfying the Justification Test, the proposal will demonstrate that appropriate mitigation and management measures are put in place.

6.4.3 Flood Management Action Plan

There are various levels of flood management plans and these include the overall strategy for the river catchment, the emergency response plan of the Council and the flood risk management plan at a site-specific level.

6.4.4 Strategic Flood Risk Management Plan

This will be informed by the detailed assessment of areas at significant flood risk: A Strategic Countywide FRMP will pull together the recommendations from each CFRAM FRMP in the Eastern and Neagh-Bann river basin districts and the Dunleer FRMP. The formulation of a management plan is particularly important in any areas reliant on protection from flood defences.

The management plan must consider residual risk and an effective emergency response should the defences fail due to overtopping or breach. The CFRAM FRMP's include flood risk management options for all the Areas for Further Assessment (AFA) in Louth.

6.4.5 Site Specific Flood Risk Assessment (FRA)

This will be specific to the development and associated activities. A Site-Specific FRA, which may include an emergency plan, will be required for any development proposal that is seeking planning permission in an area of flood risk.

6.5 Development Relating To Management of Surface Water

Development has the potential to cause an increase in impermeable area and an associated increase in surface water runoff rates and volumes. This can lead to potential increase in flood risk downstream due to overloading of existing drainage infrastructure.

Managing surface water discharges from new development is crucial in managing and reducing flood risk to other development downstream. The management of surface water is an important concern for all development sites.

6.6 Strategic Flood Risk Assessment, Level 3, 4 and 5 Settlements

(Data & Mapping Derived from Office of Public Works (OPW), OPW CFRAM Study, LCC Dunleer Flood Study and OPW Preliminary Flood Risk Assessment).

Introduction

The Planning System and Flood Risk Management Guidelines for Planning Authorities emphasises the importance of including robust flood risk policies in the development plan.

The SFRA is an area-wide study and the level of detail is commensurate with its strategic nature. It does not provide suitably detailed site-specific information, such as design flood levels. A site-specific flood risk assessment is still required to cover in more detail all sources of flood risk for individual developments. The level of detail required for a site-specific flood risk assessment depends on the scale and nature of the development and the risks involved.

The Strategic Flood Risk Assessment for the Louth County Development Plan 2021-2027 contains a series of maps detailing potential flood risk for the County as a whole, including the settlements.

It contains detailed maps illustrating an evaluation of the potential flood risk for each of the Level 3, 4 and 5 Settlements as set out in Chapter 2 of the Louth County Development Plan 2021-2027.

6.7 Impact of Strategic Flood Risk Assessment on the Louth County Core Strategy

The development strategy for County Louth as contained within Chapter 2 of the Louth County Development Plan 2021-2027 (Core and Settlement Strategy) states that the focus is on growing each of the Regional Growth Centres of Drogheda and Dundalk to city scale of 50,000 by 2030 serving as economic drivers for the region. The strategy also provides for moderate growth in the Self-Sustaining Growth Towns of Ardee and Dunleer and contained, sustainable growth in the Self-Sustaining Towns of Carlingford, Clogherhead, Termonfeckin, Tullyallen and Castlebellingham/Kilsaran and the remaining small towns and villages including Annagassan, Baltray, Collon, Dromiskin, Knockbridge, Louth Village, Omeath, Tallanstown and others. Growth will be directed towards urban centres while protecting the rural hinterlands. It will therefore be vital to ensure that flood risk will not be a major constraint for this planned growth.

Note: *The supporting Justification Tests of this Strategic Flood Risk Assessment are set out in Appendix 1.*

Appendix 1 – Justification Tests

Introduction

The Justification Test as detailed in The Planning System and Flood Risk Management – Guidelines for Planning Authorities 2009 (OPW) and as referenced in Section 4.3 of the Strategic Flood Risk Assessment has been incorporated as an Appendix to the SFRA (Vol. 5). These Justification Tests should be read in conjunction with the SFRA.

The Settlements subject to the Justification Test are as outlined below:

Regional Growth Centres	Self Sustaining Growth Towns	Self Sustaining Towns	Small Towns and Villages
Drogheda	Ardee	Carlingford	Annagassan
Dundalk	Dunleer	Clogherhead	Baltray
		Castlebellingham/Kilsaran	Collon
		Termonfeckin	Dromiskin
		Tullyallen	Knockbridge
			Louth Village
			Omeath
			Tallanstown

Development Plan - Justification Test

Having prepared a Strategic Flood Risk Assessment and mapped flood zones as part of the Development Plan review process, situations may arise where a planning authority needs 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.

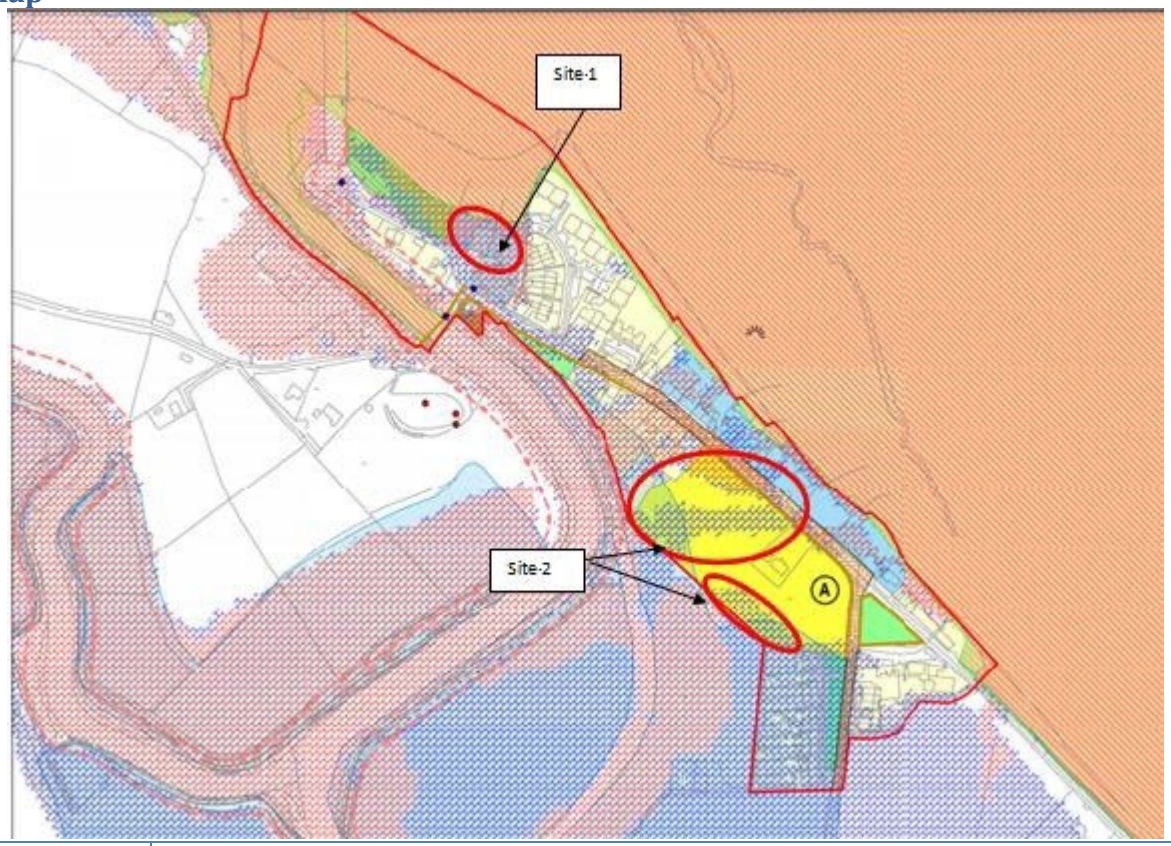
In such cases the planning authority must be satisfied that it can clearly demonstrate that the zoning or designation for development will satisfy the Justification Test (Box 4.1) of The Planning and Flood Risk Assessment – Guidelines for Planning Authorities 2009 and the three criteria set out therein. These are detailed below.

(Box 4.1) Justification Test for Development Plans	
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: i. Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement; ii. Comprises significant previously developed and/or under-utilised lands; iii. Is within or adjoining the core of an established or designated urban settlement; iv. Will be essential in achieving compact sustainable urban growth; and v. 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.

Annagassan

Hierarchy	Small Towns and Villages
Area for Further Assessment under the CFRAM Programme	Yes

Map



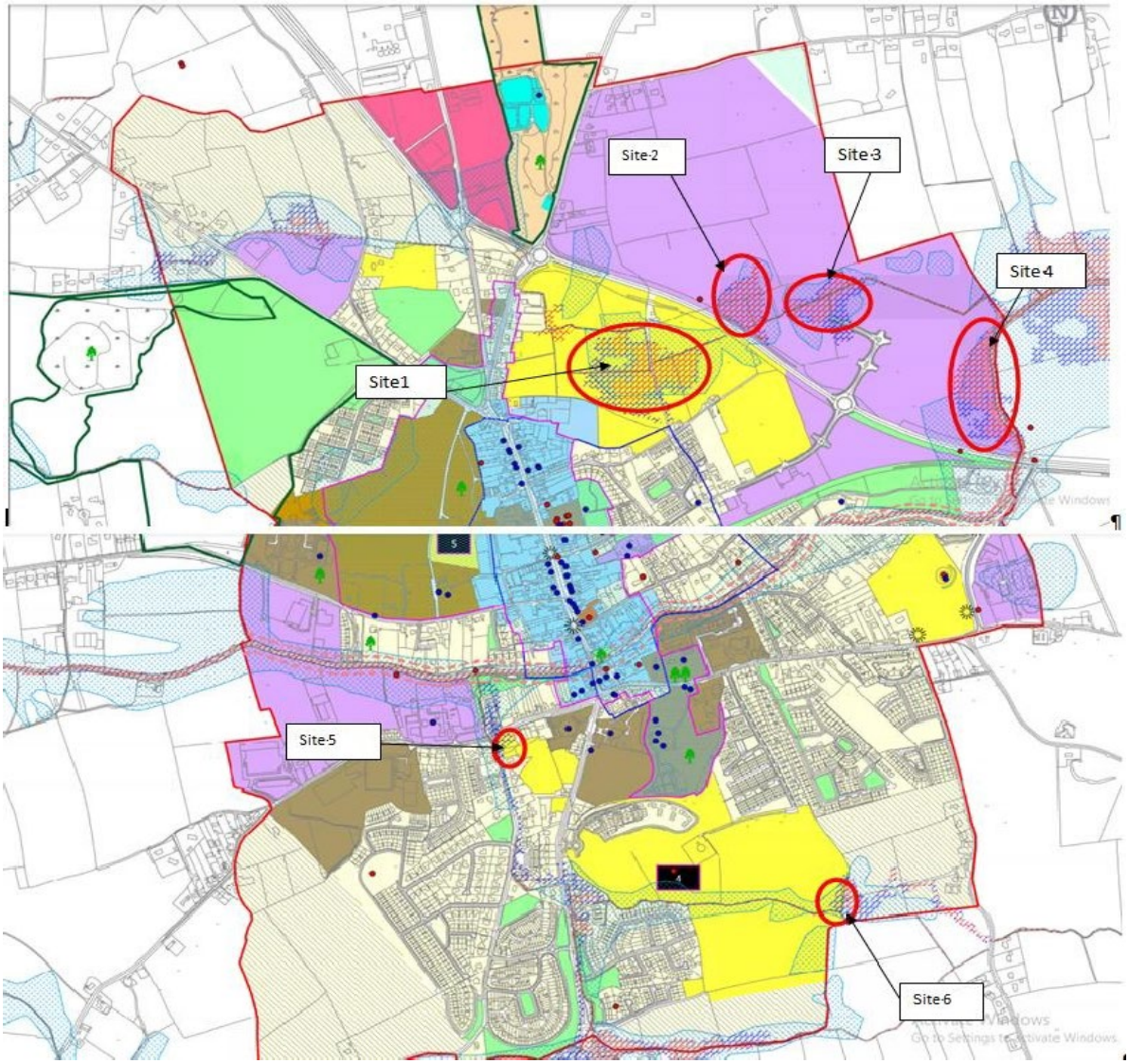
Criteria 1	Annagassan in the Louth Settlement Strategy is identified as Level 4 'Small Towns and Villages'. The Core and Growth Strategies both focus on ensuring localised sustainable growth proportionate to the size of the settlement, prioritised on infill/brownfield sites with support for economic related development that strengthens the local employment base and reduces dependence on commuting. Annagassan has a weak employment base with a dependence on outbound commuting. In support of these strategies, the corresponding Policy Objectives seek to facilitate balanced and proportionate population and economic growth to meet the needs of the residents of the settlements while creating vibrant rural communities through the promotion and targeting of sustainable growth. The rejuvenation of vacant and underutilised lands for appropriate uses is also encouraged. Annagassan, as one of eight identified 'Areas for Further Assessment', was subject to the CFRAM programme with associated Flood Zones A and B identified.
Criteria 2	**Site 1**: Rezone undeveloped lands zoned 'Town or Village Centre' (B1) which are subject to Flood Zone A, as the uses permitted within this land use category would not be compatible. The lands are to be rezoned as 'Open Space' (H1) **Site 2**: Rezone lands zoned New Residential (A2) which are subject to both Flood Zones A and B as the primary provision of residential development on these lands is not compatible. These lands are to be rezoned 'Open Space' (H1). **Infill Lands**: Lands within the existing settlement and zoned 'Town or Village Centre' (B1) and 'Existing Residential' (A1) are characterised by existing buildings and structures with a range of varying uses. A justification test was not carried out on these lands as they are already developed. Further development on the lands will be of an infill/brownfield nature.

	Within areas of existing development, proposals for extensions and minor development shall be assessed with reference to Section 5.28 of the Planning System and Flood Risk Management Guidelines and in accordance with Policies IU 26-IU 35 of the LCDP. Any highly vulnerable or less vulnerable land uses affected by Flood Zone A and B should employ the sequential approach when considering the site layout and an appropriately detailed Site Specific FRA must be submitted at development management stage.
Criteria 3	A detailed site-specific FRA shall be submitted with any planning application to address flood risk, propose mitigation measures and assign appropriate development. Site-specific FRA's should address the following: • The sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain. • Highly Vulnerable Development shall not be permitted in Flood Zone A or B. • Development in Flood Zone A should be either open space or water compatible. • FRA should address residual risk of culvert blockage (where applicable), increased flood extents under climate change scenarios and pluvial risk which should be aimed at setting finished floor levels. • Compensatory storage for development that results in a loss of floodplain within Flood Zone A must be provided on a level for level basis.
Conclusion	**Site 1** Justification Test failed. Rezone lands Open Space. **Site 2** Justification Test failed. Rezone lands Open Space. It is recommended that any proposals for future development on lands vulnerable to flooding and in Flood Zones A and B will be subject to a site specific FRA to ensure that development is appropriate and satisfies Criteria 3 of the Justification Test.

Ardee

Hierarchy	Self Sustaining Growth Town
Area for Further Assessment under the CFRAM Programme	Yes

Map



Criteria 1	The Louth County Development Plan Settlement Strategy identifies Ardee as a 'Self-Sustaining Growth Town' in line with the criteria and informed by the principal elements of the RSES. Louth's growth strategy seeks to support Ardee as a regionally important local driver providing a moderate level of jobs and services for the resident population and the surrounding catchments. Ardee is acknowledged as an important local service centre in mid-Louth providing a range of both services and employment to an extensive catchment that extends into parts of Meath and Monaghan. The growth strategy for Ardee is to consolidate its designation as a 'Self Sustaining Growth Town', continuing to expand its employment base and facilitate sustainable residential growth to meet the needs of a localised demand. The sequential approach to the development of residential lands is encouraged within the Plan, with priority to lands in proximity to the town centre, to facilitate the creation of attractive, sustainable communities.

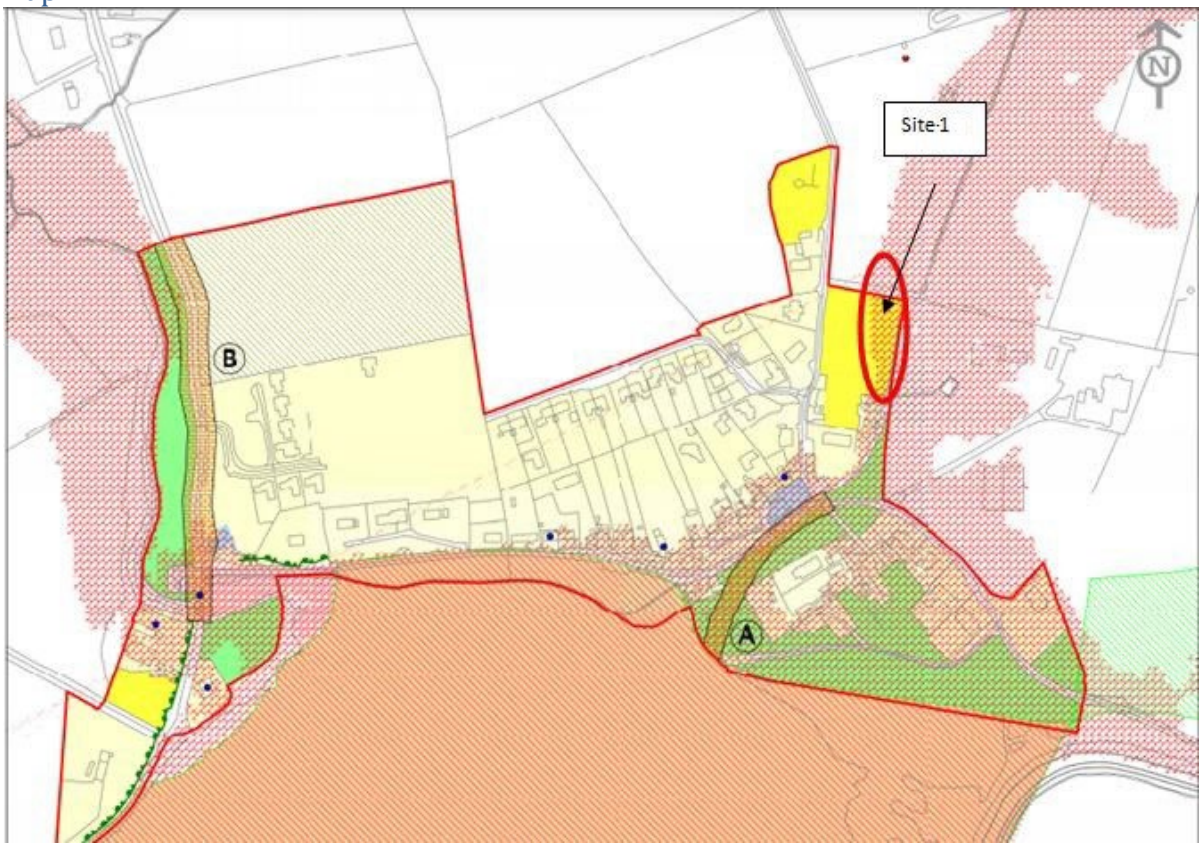
	Its policy objectives seek to facilitate a balanced population and economic growth, supporting the creation of a sustainable compact settlement, inclusive communities and the revitilisation and reduction in town centre vacancy. Ardee has a strong employment base with the third highest Job:Workforce ratio, sitting only behind Dundalk and Dunleer. Ardee, as one of eight identified 'Areas for Further Assessment', was subject to the CFRAM programme, with associated Flood Zones A and B identified.
Criteria 2	**Site 1:** The lands are zoned 'New Residential' (A1), are vulnerable to fluvial flooding and are in Flood Zones A and B wherein the primary provision of residential development is not appropriate. Rezone the lands to 'Open Space' (H1). **Site 2:** The lands are zoned 'General Employment' (E1) and a portion are vulnerable to fluvial flooding and in Flood Zones A and B. As the vast portion of these zoned lands is not identified for potential flood risk and is located within Flood Zone C it is anticipated that flood risk mitigation measures could be designed to allow development of the wider site, as necessary. Development of the site will require a Site Specific FRA which should consider the sequential approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009. **Site 3:** The lands are zoned 'General Employment' (E1) and a portion are vulnerable to fluvial flooding and in Flood Zones A and B. These lands are centrally located and take access off the adjoining N33 and associated roundabout. To date planning permission has been granted for development on a portion of these lands under Reg. Ref. No's: 19/1 and 20/749. In the case of the former application this was accompanied by an engineering report which addressed the issues of fluvial flooding whilst in the latter a site-specific FRA accompanied the planning application. **Site 4:** Rezone lands zoned 'General Employment' (E1) which are vulnerable to flooding and in Flood Zone A and B. The uses generally permitted within this land use category are not appropriate and it is considered that the application of the justification test is not appropriate on this occasion given the peripheral location of the site within the overall employment lands. Rezone the lands to 'Open Space'. **Site 5:** These lands are zoned 'New Residential' (A1), a portion of which are in Flood Zone B. The lands are in close proximity to the town centre, and support the principles of consolidation, compact development, and sequential and sustainable development. Louth County Council under Reg. Ref. No. 19/734 granted planning permission for 26 residential units on this site subject to conditions. The application was accompanied by a Site Specific FRA. This decision was upheld on appeal to An Bord Pleanála. **Site 6:** These lands are zoned 'New Residential' (R2) and are affected primarily by Flood Zone B with only a slight area affected by Flood Zone A. As the vast portion of these zoned lands is not identified for potential flood risk and is located within Flood Zone C it is anticipated that flood risk mitigation measures could be designed to allow development of the wider site, as necessary. Development of the site will require a Site Specific FRA which should consider the sequential approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009. **Infill Lands:** Lands within the existing settlement including 'Town or Village Centre' (B1), 'Existing Residential' (R1) and 'Community Facilities' (G1) are characterised by existing buildings and structures with a range of varying uses. A Justification Test was not carried out on these lands as they are already developed. Further development on the lands will be of an infill/brownfield nature.

	Within areas of existing development, proposals for extensions and minor development shall be assessed with reference to Section 5.28 of the Planning System and Flood Risk Management Guidelines, in accordance with Policies IU 26-IU 35 of the LCDP. Any highly vulnerable or less vulnerable land uses affected by Flood Zone A and B should employ the sequential approach when considering the site layout and an appropriately detailed site-specific FRA must be submitted at development management stage.
Criteria 3	A detailed site specific FRA shall be submitted with any planning application to address flood risk, propose mitigation measures and assign appropriate development. A site-specific FRA should address the following: • A sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain. • Highly Vulnerable Development shall not be permitted in Flood Zone A or B. • Development in Flood Zone A should be either open space or water compatible. • FRA should address residual risk of culvert blockage (where applicable), increased flood extents under climate change scenarios and pluvial risk which should be aimed at setting finished floor levels. Compensatory storage for development that results in a loss of floodplain within Flood Zone A must be provided on a level for level basis.
Conclusion	**Site 1** Justification Test failed. Rezone Open Space. **Site 2** Justification Test satisfied. **Site 3** Extant planning permission accompanied by Site Specific FRA. **Site 4** Justification test failed. Rezone lands to Open Space. **Site 5** Extant planning permission accompanied by Site Specific FRA. Site 6 Justification Test satisfied. It is recommended that any proposals for future development on lands vulnerable to flooding and in Flood Zones A and B will be subject to a site specific FRA to ensure that development is appropriate and satisfies Criteria 3 of the Justification Test.

Baltray

Hierarchy	Small Towns and Villages
Area for Further Assessment under the CFRAM Programme	Yes

Map



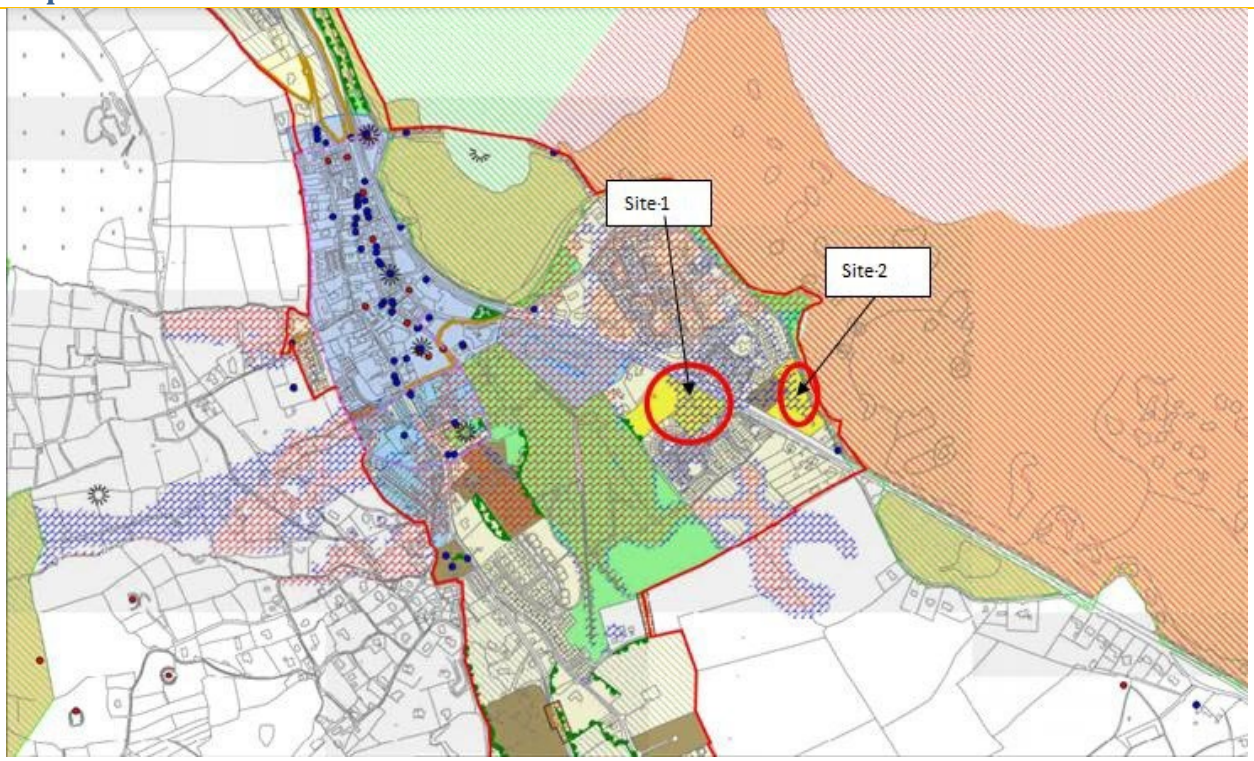
Criteria 1	Baltray in the Louth Settlement Strategy is identified as Level 4 'Small Towns and Villages' and is the smallest settlement in this category. The Core and Growth Strategies both focus on ensuring localised sustainable growth proportionate to the size of the settlement, prioritised on infill/brownfield sites with support for economic related development that strengthens the local employment base and reduces dependence on commuting. Baltray has a weak employment base with a dependence on outbound commuting. In support of these strategies, the corresponding Policy Objectives seek to facilitate balanced and proportionate population and economic growth to meet the needs of the residents of the settlements while creating vibrant rural communities through the promotion and targeting of sustainable development. The rejuvenation of vacant and underutilised lands for appropriate uses is also encouraged. Baltray, as one of eight identified 'Areas for Further Assessment', was subject to the CFRAM programme with associated Flood Zones A and B identified.
Criteria 2	**Site 1**: Rezone lands zoned New Residential (A2) which are subject to Flood Zone A, as the primary provision of residential development on these lands is not compatible. These lands are to be rezoned as 'Open Space' (H1). **Infill Lands**: Lands within the existing settlement that are zoned 'Town or Village Centre' (B1) or 'Existing Residential' (A1) are characterised by existing buildings and structures with a range of varying uses. A Justification Test was not carried out on these lands as they are already developed. Further development on these lands will be of an infill/brownfield nature.

	Within areas of existing development, proposals for extensions and minor development shall be assessed with reference to Section 5.28 of the Planning System and Flood Risk Management Guidelines, in accordance with Policies IU 26-IU 35 of the LCDP. Any highly vulnerable or less vulnerable land uses affected by Flood Zone A or B should employ the sequential approach when considering the site layout and an appropriately detailed site-specific FRA must be submitted at development management stage.
Criteria 3	A detailed site-specific FRA shall be submitted with any planning application to address flood risk, propose mitigation measures and assign appropriate development. A site-specific FRA should address the following: • A sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain. • Highly Vulnerable Development shall not be permitted in Flood Zone A or B. • Development in Flood Zone A should be either open space or water compatible. • FRA should address residual risk of culvert blockage (where applicable), increased flood extents under climate change scenarios and pluvial risk which should be aimed at setting finished floor levels. • Compensatory storage for development that results in a loss of floodplain within Flood Zone A must be provided on a level for level basis.
Conclusion	**Site 1** Justification Test failed. Rezone lands Open Space. It is recommended that any proposals for future development on lands vulnerable to flooding and in Flood Zones A and B will be subject to a site-specific FRA to ensure that development is appropriate and satisfies Criteria 3 of the Justification Test.

Carlingford

Hierarchy	Self Sustaining Town
Area for Further Assessment under the CFRAM Programme	Yes

Map



Criteria 1	Carlingford in the Settlement Strategy of the LCDP is identified as a 'Self-Sustaining Town'. The Core and Growth Strategies both focus on driving investment in services, employment growth and infrastructure while balancing housing delivery, including consolidation of the core areas and delivery of compact growth. In support of these strategies, the corresponding Policy Objectives seek to facilitate balanced and proportionate population and economic growth to meet the needs of the residents of the settlements while creating vibrant rural communities through the promotion and targeting of sustainable development. The rejuvenation of vacant and underutilised lands for appropriate uses is also encouraged. Carlingford is a settlement characterised by a very strong employment base. Carlingford as one of eight identified 'Areas for Further Assessment' was subject to the CFRAM programme, with associated Flood Zones A and B identified.
Criteria 2	**Site 1**: These lands are zoned 'New Residential' (A2) with approximately half of the lands in Flood Zone B, and the more elevated lands in Flood Zone C. The site is centrally located within the settlement, and in close proximity to the commercial centre, encircled to the north, south and east by Existing Residential (A1) development. The zoning of these lands for 'New Residential' will not seek to expand the centre of the settlement but rather will seek to realise the policy objectives of both the core and growth strategies which seek to consolidate core areas and deliver compact growth, while supporting the creation of vibrant communities. Simultaneously it will promote sequential and sustainable development of lands adjoining the existing built up area, which are under-utilised, and are preferential to peripheral locations. Compact forms of growth such as this can bring more life and footfall, contribute to the viability of services and public transport, increase housing supply in a serviced area and enable people to be closer to employment and recreational opportunities.

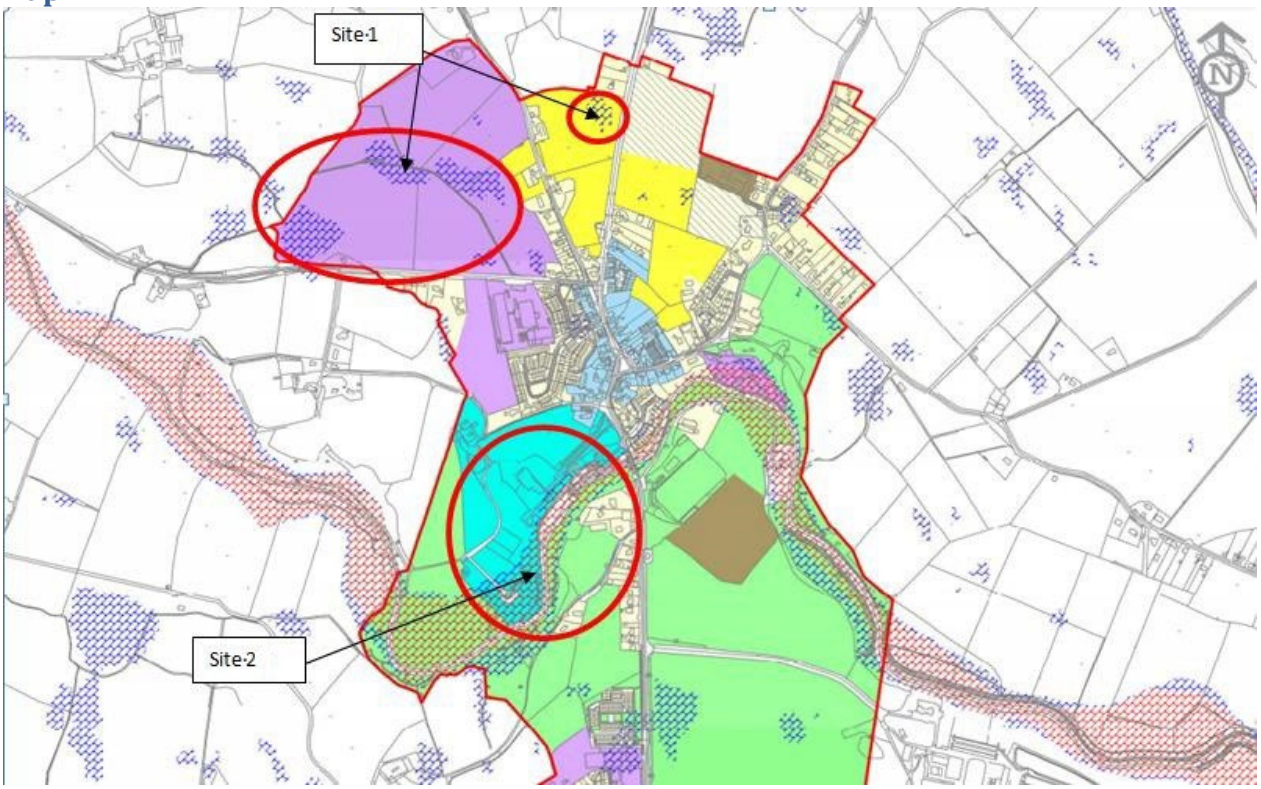
	A substantial portion of these zoned lands is not identified for potential flood risk and is located within Flood Zone C. It is anticipated that flood risk mitigation measures could be designed to allow development of the wider site, as necessary. Development of the site will require a site-specific FRA which should consider the sequential approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009. **Site 2**: Rezone lands 'New Residential' (A2) in Flood Zone B to 'Tourism and Leisure' (I1) the objective of which is to provide for and enhance tourism and leisure facilities. The rezoning of the lands provides for uses which fall into the category of less vulnerable development and as such are considered appropriate in terms of lands affected by Flood Zone B. The rezoning of these lands will realise policy objectives including supporting the development of Carlingford as a sustainable tourism hub, facilitating sustainable development that will create locally based employment opportunities and supporting the creation of vibrant communities. The rezoning of the lands does not seek to expand the development boundary of the settlement as the subject lands are located between existing community and residential uses. Rather, it comprises under-utilised land within the settlement boundary in close proximity to the commercial core which can consolidate and provide for compact growth of the settlement centre. Compact forms of growth such as this can bring more life and footfall, contribute to the viability of services and public transport, increase housing supply in a serviced area and enable people to be closer to employment and recreational opportunities. A portion of these zoned lands is not identified for potential flood risk and is located within Flood Zone C. It is anticipated that flood risk mitigation measures could be designed to allow development of the wider site, as necessary. Development of the site will require a site-specific FRA which should consider the Approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009. **Infill Lands**: Lands within the existing settlement and zoned 'Town or Village Centre' (B1), 'Existing Residential' (R1) and 'Community Facilities' (G1) are characterised by existing buildings and structures with a range of varying uses. A Justification Test was not carried out on these lands as they are already developed. Further development on the lands will be of an infill/brownfield nature. Within areas of existing development, proposals for extensions and minor development shall be assessed with reference to Section 5.28 of the Planning System and Flood Risk Management Guidelines, in accordance with Policies IU 26-IU 35 of the LCDP. Any highly vulnerable or less vulnerable land uses affected by Flood Zone A or B should employ the sequential approach when considering the site layout and an appropriately detailed site-specific FRA must be submitted at development management stage.
Criteria 3	A detailed site-specific FRA shall be submitted with any planning application to address flood risk, propose mitigation measures and assign appropriate development. A site specific FRA should address the following: • A sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain. • Highly Vulnerable Development shall not be permitted in Flood Zone A or B. • Development in Flood Zone A should be either open space or water compatible. • FRA should address residual risk of culvert blockage (where applicable), increased flood extents under climate change scenarios and pluvial risk which should be aimed at setting finished floor levels. • Compensatory storage for development that results in a loss of floodplain within Flood Zone A must be provided on a level for level basis.

Conclusion	**Site 1** Justification Test satisfied. **Site 2** Justification Test satisfied. It is recommended that any proposals for future development on lands vulnerable to flooding and in Flood Zones A and B will be subject to a site-specific FRA to ensure that development is appropriate and satisfies Criteria 3 of the Justification Test.

Castlebellingham/Kilsaran

Hierarchy	Self Sustaining Town
Area for Further Assessment under the CFRAM Programme	No

Map



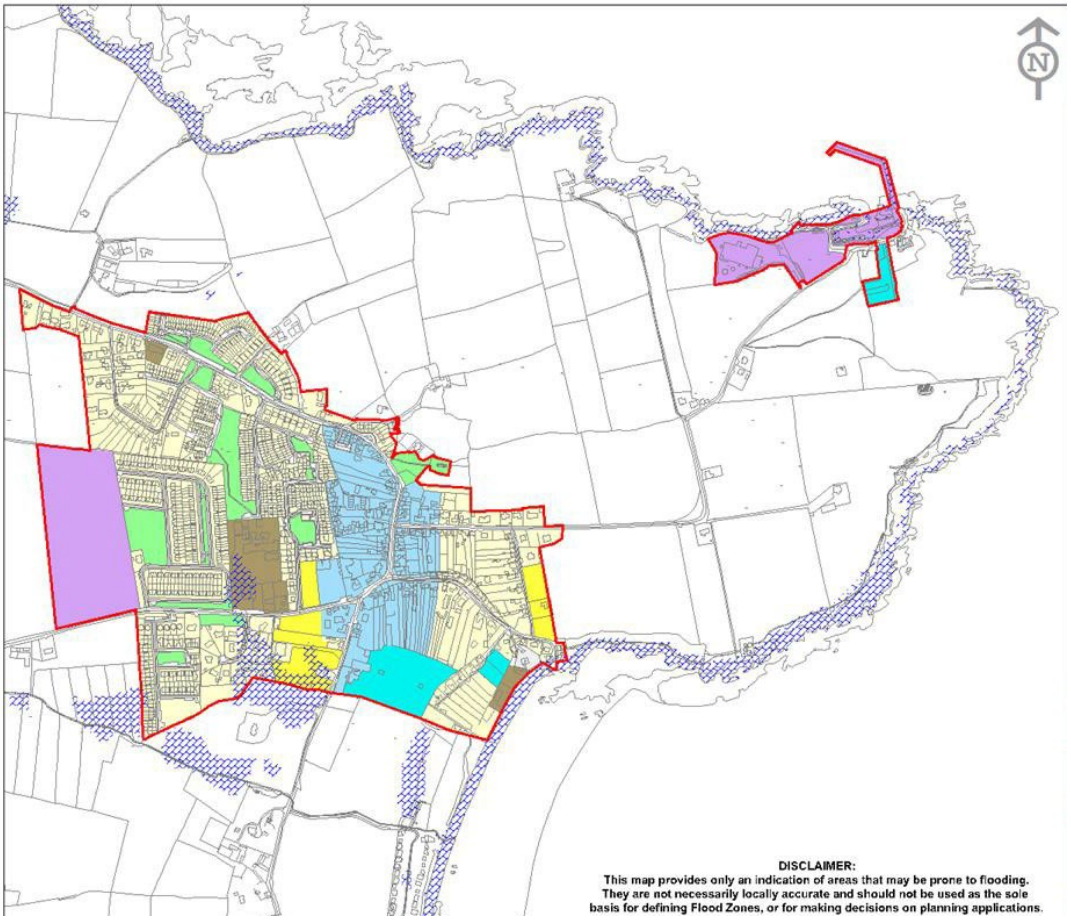
Criteria 1	Castlebellingham/Kilsaran in the Settlement Strategy of the LCDP is identified as a 'Self-Sustaining Town'. The Core and Growth Strategies both focus on driving investment in services, employment growth and infrastructure while balancing housing delivery, including consolidation of the core areas and delivery of compact growth. In support of these strategies, the corresponding Policy Objectives seek to facilitate balanced and proportionate population and economic growth to meet the needs of the residents of the settlements while creating vibrant rural communities through the promotion and targeting of sustainable development. The rejuvenation of vacant and underutilised lands for appropriate uses is also encouraged. Castlebellingham/Kilsaran is a settlement characterised by a strong employment base. The Preliminary Flood Risk Assessment (PFRA) mapping undertaken by the OPW (2011) identifies lands within the Castlebellingham/Kilsaran development boundary at potential flood risk. The PFRA considered flooding from a number of sources including fluvial, pluvial, tidal and groundwater with associated Flood Zones A and B identified. It is acknowledged that the areas identified should be treated with caution due to the indicative nature of the PFRA mapping.
Criteria 2	**Site 1**: Refers to lands which are zoned both 'New Residential' (A2) and 'General Employment' (E1) to the north of the Settlement and both of which are affected by Flood Zone B. The PFRA identifies that portions of the site are vulnerable to Pluvial Flooding. With the introduction of a new mapping layer to all settlements in County Louth specifically identifying pluvial flooding, the designation of Flood Zones in this regard will no longer be applicable. (See Section 10.3.1 and 10.3.2 of the Plan for explanation).

	Site 2: These lands are zoned for 'Tourism and Leisure' (I1) and portions of the site are indicated as vulnerable to Fluvial Flooding associated with the River Glyde, with areas being in both Flood Zones A and B. As the substantial portion of these zoned lands is not identified for potential flood risk and is located within Flood Zone C it is anticipated that flood risk mitigation measures could be designed to allow development of the wider site, as necessary. Development of the site will require a site-specific FRA which should consider the sequential approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009. **Infill Lands**: Lands within the existing settlement and zoned 'General Employment (E1)' and 'Existing Residential' (A1) are characterised by existing buildings and structures with a range of varying uses. A Justification Test was not carried out on these lands as they are already developed. Further development on the lands will be of an infill/brownfield nature. Within areas of existing development, proposals for extensions and minor development shall be assessed with reference to Section 5.28 of the Planning System and Flood Risk Management Guidelines, in accordance with Policies IU 26-IU 35 of the LCDP. Any highly vulnerable or less vulnerable land uses affected by Flood Zone A or B should employ the sequential approach when considering the site layout and an appropriately detailed site-specific FRA must be submitted at development management stage.
Criteria 3	A detailed site-specific FRA shall be submitted with any planning application to address flood risk, propose mitigation measures and assign appropriate development. A site-specific FRA should address the following: • A sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain. • Highly Vulnerable Development shall not be permitted in Flood Zone A or B. • Development in Flood Zone A should be either open space or water compatible. • FRA should address residual risk of culvert blockage (where applicable), increased flood extents under climate change scenarios and pluvial risk which should be aimed at setting finished floor levels. • Compensatory storage for development that results in a loss of floodplain within Flood Zone A must be provided on a level for level basis.
Conclusion	**Site 1** No Justification Test required (Pluvial Flooding). **Site 2** Justification Test satisfied. It is recommended that any proposals for future development on lands vulnerable to flooding and in Flood Zones A and B will be subject to a site-specific FRA to ensure that development is appropriate and satisfies Criteria 3 of the Justification Test. Given the indicative pluvial flood risk highlighted by the PFRA, any proposed development within Castlebellingham/Kilsaran should consider the management and disposal of surface water in compliance with SuDS principles and in line with approved policy objectives of the Development Plan.

Clogherhead

Hierarchy	Self Sustaining Town
Area for Further Assessment under the CFRAM Programme	No

Map



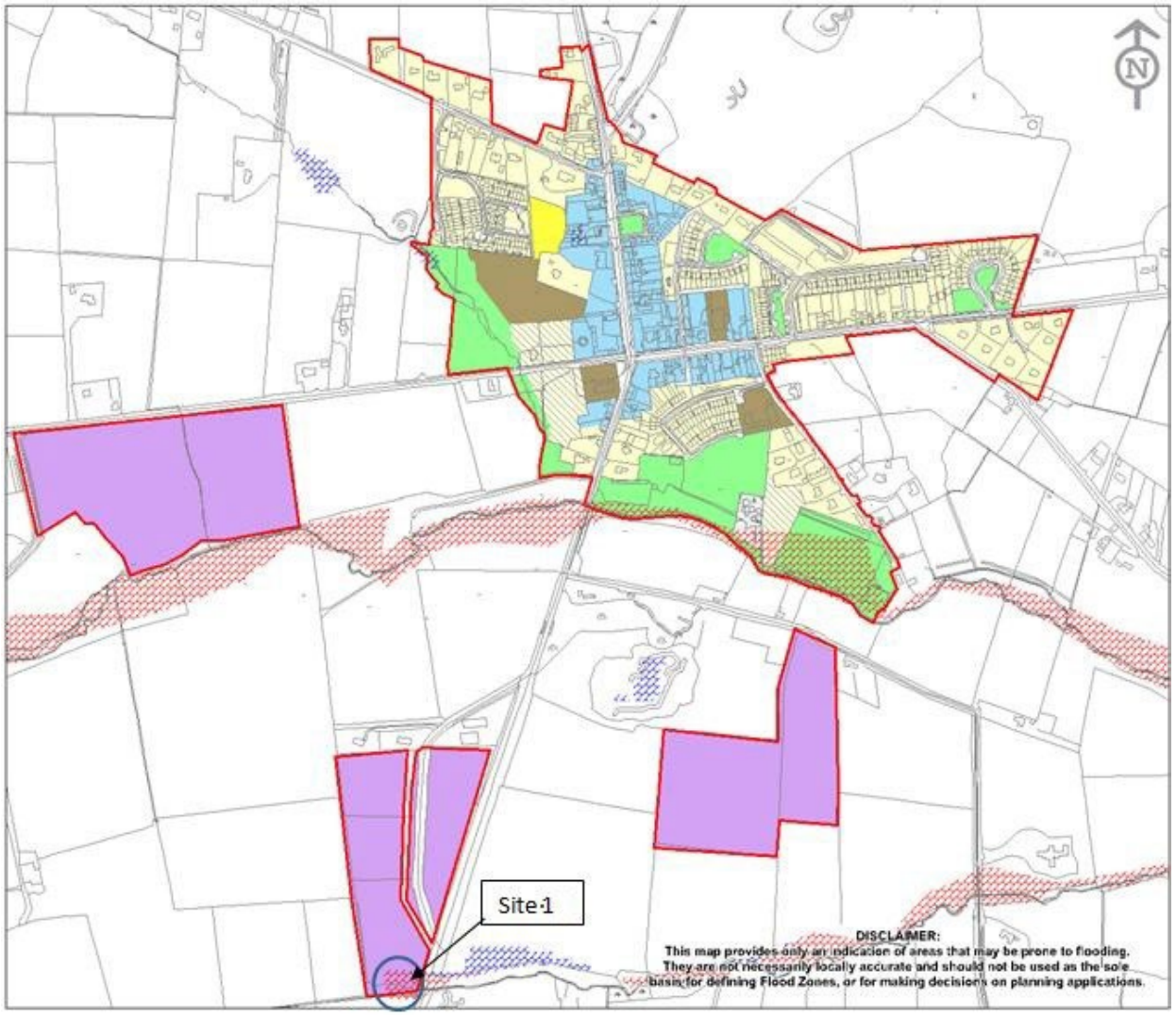
Criteria 1	Clogherhead in the Settlement Strategy of the LCDP is identified as a 'Self-Sustaining Town'. The Core and Growth Strategies both focus on driving investment in services, employment growth and infrastructure while balancing housing delivery, including consolidation of the core areas and delivery of compact growth. In support of these strategies the corresponding Policy Objectives seek to facilitate balanced and proportionate population and economic growth to meet the needs of the residents of the settlements while creating vibrant rural communities through the promotion and targeting of sustainable development. The rejuvenation of vacant and underutilised lands for appropriate uses is also encouraged. Clogherhead is a settlement characterised by a weak employment base. The Preliminary Flood Risk Assessment (PFRA) mapping undertaken by the OPW (2011) identifies lands within the Clogherhead development boundary at potential flood risk. The PFRA considered flooding from a number of sources including fluvial, pluvial, tidal and groundwater with associated Flood Zones A and B identified. It is acknowledged that the areas identified should be treated with caution due to the indicative nature of the PFRA mapping.
Criteria 2	In Clogherhead there are lands zoned 'Existing Residential' (A1), 'New Residential' (A2) and 'Community Facilities' (G1) indicated as being vulnerable to Pluvial Flooding in the PFRA.

	With the introduction of a new mapping layer to all settlements in County Louth specifically identifying pluvial flooding, the designation of Flood Zones in this regard will no longer be applicable. (See Section 10.3.1 and 10.3.2 of the Plan for explanation).
Criteria 3	No fluvial or coastal flooding.
Conclusion	Given the indicative pluvial flood risk highlighted by the PFRA, any proposed development within Clogherhead Village should consider the management and disposal of surface water in compliance with SuDS principles and in line with approved policy objectives of the Development Plan.

Collon

Hierarchy	Small Towns and Villages
Area for Further Assessment under the CFRAM Programme	No

Map



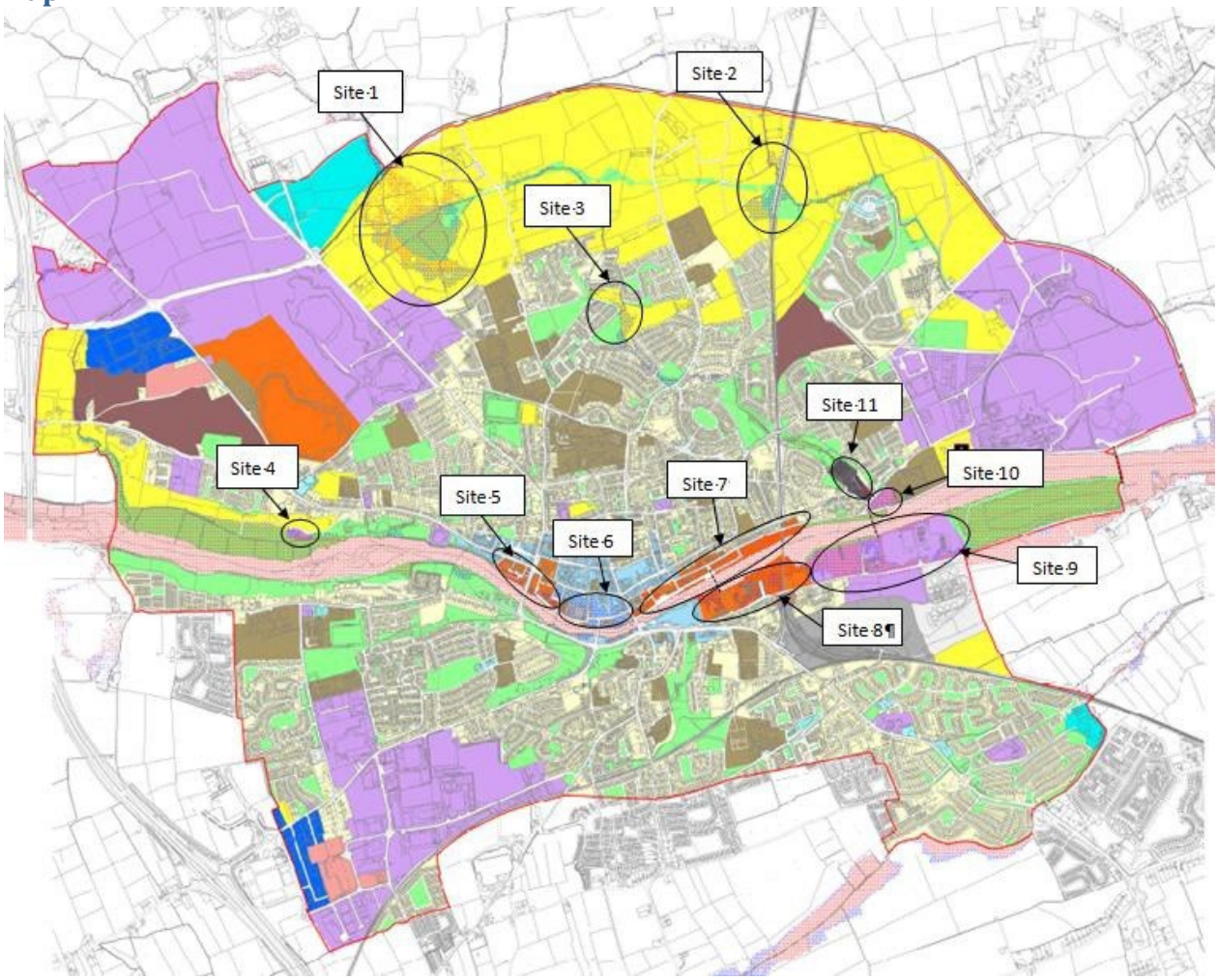
Criteria 1	Collon in the Louth Settlement Strategy is identified as Level 4 'Small Towns and Villages'. The Core and Growth Strategies both focus on ensuring localised sustainable growth proportionate to the size of the settlement, prioritised on infill/brownfield sites with support for economic related development that strengthens the local employment base and reduces dependence on commuting. Collon has a weak employment base with a dependence on outbound commuting. In support of these strategies, the corresponding Policy Objectives seek to facilitate balanced and proportionate population and economic growth to meet the needs of the residents of the settlements while creating vibrant rural communities through the promotion and targeting of sustainable development. The rejuvenation of vacant and underutilised lands for appropriate uses is also encouraged. The Preliminary Flood Risk Assessment (PFRA) mapping undertaken by the OPW (2011) identifies lands within Collon development boundary at potential flood risk. The PFRA considered flooding from a number of sources including fluvial, pluvial, tidal and groundwater with associated Flood Zones A and B identified. It is acknowledged that the areas identified should be treated with caution due to the indicative nature of the PFRA mapping.

Criteria 2	**Site 1**: These lands are zoned 'General Employment' (E1), a portion of which are indicated as vulnerable to fluvial flooding and with the associated area of the site being in Flood Zone A. To date the lands north and east of the access road have been developed. As the substantial portion of these zoned lands is not identified for potential flood risk and is located within Flood Zone C it is anticipated that flood risk mitigation measures could be designed to allow development of the wider site, as necessary. Development of the site will require a site-specific FRA which should consider the sequential approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009.
Criteria 3	A detailed site-specific FRA shall be submitted with any planning application to address flood risk, propose mitigation measures and assign appropriate development. A site-specific FRA should address the following: • A sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain. • Highly Vulnerable Development shall not be permitted in Flood Zone A or B. • Development in Flood Zone A should be either open space or water compatible. • FRA should address residual risk of culvert blockage (where applicable), increased flood extents under climate change scenarios and pluvial risk which should be aimed at setting finished floor levels. • Compensatory storage for development that results in a loss of floodplain within Flood Zone A must be provided on a level for level basis.
Conclusion	**Site 1** Justification Test satisfied. It is recommended that any proposals for future development on lands vulnerable to flooding and in Flood Zones A and B will be subject to a site-specific FRA to ensure that development is appropriate and satisfies Criteria 3 of the Justification Test.

Drogheda

Hierarchy	Regional Growth Centre
Area for Further Assessment under the CFRAM Programme	Yes

Map



Criteria 1	In line with the National Planning Framework, the Regional Spatial and Economic Strategy for the Eastern and Midland Region has, in its Settlement Hierarchy identified Drogheda as a Regional Growth Centre (RGC). It acknowledges it as a town with high level self-sustaining employment and services which act as regional economic drivers while playing a significant role for a wide catchment area. It supports significant population and economic growth in these centres, which is critical to the implementation of effective regional development. A key priority is to promote the continued sustainable and compact growth of Drogheda as a regional driver of city scale with a target population of 50,000 by 2031. It identifies a strategic development framework for the future growth of the town to allow it reach sufficient scale, to be a driver of regional growth and in recognition of its critical role in successful regional development. Drogheda as one of eight identified 'Areas for Further Assessment' was subject to the CFRAM programme, with associated Flood Zones A and B identified.
Criteria 2	**Site 1 and Site 2:** These lands are zoned 'New Residential' (A2), are vulnerable to fluvial and coastal flooding and in Flood Zones A and B. These lands are subject to a Masterplan which was prepared on foot of the 'North Drogheda Environs Local Area Plan'.

	A substantial portion of the overall North Drogheda Environs lands, including Sites 1 and 2, have extant planning permissions primarily for the provision of residential development. While Site 1 (Flood Zones A and B) is extensive in area a substantial portion of these lands are zoned Open Space in the Masterplan and identified as a Wetland Park (approximately 6.8ha). In addition to this there is a further area of approximately 15.8ha which is identified as a Wetland Area (reserved attenuation area), which encompasses a substantial remainder of the lands identified as vulnerable to flooding at this location. The Masterplan specifies that this Wetland Area shall not be developed until a detailed flood analysis is completed over an extended period of time (at least 5 years) and if the study finds that the area is necessary to be retained as part of the floodplain, then this Wetland Area will be added to the overall quantum of open space within the Masterplan lands. While Site 2 is less extensive in area than Site 1, it too has a portion of the lands zoned for Open Space within the Masterplan. The vast majority of the land vulnerable to fluvial flooding and outside of the Open Space has an extant planning permission. Residential development in the wider Drogheda area has tended to concentrate in the south of the town which has led to an imbalance of growth between north and south. The inclusion and identification of the Northern Environs lands will act as a counterbalance to the level of growth in the southern environs of Drogheda. It will ensure the town has the capacity to deliver the population and economic growth identified in both the NPF and RSES and consolidate the town's growth as an identified Regional Growth Centre. The Northern Environs lands are a fundamental part of the long term growth strategy of the town that will be developed over a number of development plans with the Council adopting a phased and managed approach to delivery. While both Sites 1 and 2 have extant planning permissions, any future applications for a change to these permissions or otherwise, will be subject to a site-specific Flood Risk Assessment. Herein, as the substantial portion of the 'New Residential' land is not identified as being vulnerable to flooding and is located within Flood Zone C, it is anticipated that flood risk mitigation measures will be designed to allow development of the wider site, as necessary. Development of the site will require a site-specific FRA which should consider the sequential approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009. **Site 3**: Refers to lands which are zoned 'New Residential' (A2), are vulnerable to fluvial flooding and are in Flood Zone B. As a substantial portion of these zoned lands are not identified as being vulnerable to flooding and are located within Flood Zone C, it is anticipated that flood risk mitigation measures will be designed to allow development of the wider site, as necessary. Development of the site will require a site-specific FRA which should consider the sequential approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009. **Site 4**: This refers to lands zoned 'General Employment' (E1) to provide for general enterprise and employment generating activities. The lands are vulnerable to fluvial and coastal flooding and are in Flood Zones A and B. Buildings associated with commercial and industrial uses are considered less vulnerable development in Flood Zone B. The lands are clearly brownfield lands with extant employment generating businesses and any development thereon will be infill in nature. **Infill Lands**: A Justification Test was not carried out on these lands as they are already developed. Further development on the lands will be of an infill/brownfield nature. Within areas of existing development, proposals for extensions and minor development shall be assessed with reference to Section 5.28 of the Planning System and Flood Risk Management Guidelines, in accordance with Policies IU 26-IU 35 of the LCDP.

	Any highly vulnerable or less vulnerable land uses affected by Flood Zone A or B should employ the sequential approach when considering the site layout and an appropriately detailed site-specific FRA must be submitted at development management stage. **Site 5**: These lands, zoned 'Regeneration' (D1), are affected by fluvial and coastal flooding and are in Flood Zones A and B. Within the Plan these lands are referred to as the 'Westgate Vision Area'. The substantive portion of the lands (east of the R132) fall into the core retail area of the town. These lands are characterised by a range of uses including retail, service, cultural, social and economic facilities. The lands to the west of the R132 display a more limited range of uses including residential and commercial facilities. Both sites lie within the Heritage Quarter of the town, which is characterised by historical buildings and areas. Evidence of dereliction, vacancy and under-utilisation of serviced urban lands characterises this site and illustrates how this portion of the town has lost its purpose and is underperforming. In response, the area is specifically earmarked as a regeneration area which offers potential for the town to deliver compact growth through the development of the vacant and under-utilised lands. The 'Westgate Vision' development strategy succeeded in securing funding under the Urban Regeneration and Development Fund (URDF). Implementation of the Vision and development of these lands will enable infill/brownfield development that might not otherwise occur. It will improve liveability, revitalise the area, encourage expansion of economic development, consolidate the town core, deliver compact, sequential and sustainable growth, build on existing assets and improve accessibility and transition to sustainable modes of transport. Collectively this will act as a catalyst for further development of the Town in line with its designation as Regional Growth Centre. These are clearly brownfield lands and any development thereon will be infill in nature. **Infill Lands**: A Justification Test was not carried out on these lands as they are already developed. Further development on the lands will be of an infill/brownfield nature. Within areas of existing development, proposals for extensions and minor development shall be assessed with reference to Section 5.28 of the Planning System and Flood Risk Management Guidelines, in accordance with Policies IU 26-IU 35 of the LCDP. Any highly vulnerable or less vulnerable land uses affected by Flood Zone A or B should employ the sequential approach when considering the site layout and an appropriately detailed site-specific FRA must be submitted at development management stage. **Site 6**: These lands are zoned 'Town or Village Centre' (B1), are vulnerable to fluvial and coastal flooding and in Flood Zones A and B. The lands fall into the core retail area of the town and at a functional level provide a range of retail, service, economic, residential and social facilities which are essential to the continued vitality and viability of the town centre. The site also lies within the Heritage Quarter which is characterised by many historical buildings and areas. Notwithstanding the primary location of these lands within the town centre, encased by existing and long established commercial development, the area is characterised by both vacancy, dereliction and under utilisation of serviced urban land and infrastructure. To strengthen, enhance and consolidate Drogheda's town core, deliver sequential and sustainable compact growth, and support the creation of vibrant communities, it is essential to realise the further development of these lands and to continue the sensitive renewal and enhancement of the Town Centre as a vibrant and attractive urban entity. This will simultaneously act as a catalyst for further development of the Town in line with its designation as a Regional Growth Centre. Compact forms of growth such as this will revitalise this area of the town, bring more life and footfall, contribute to the viability of services and public transport, increase housing supply in a serviced area and enable people to be closer to employment and recreational opportunities. These are clearly brownfield lands and any development thereon will be infill in nature. **Infill Lands**: A Justification Test was not carried out on these lands as they are already developed. Further development on the lands will be of an infill/brownfield nature.

	Within areas of existing development, proposals for extensions and minor development shall be assessed with reference to Section 5.28 of the Planning System and Flood Risk Management Guidelines, in accordance with Policies IU 26-IU 35 of the LCDP. Any highly vulnerable or less vulnerable land uses affected by Flood Zone A or B should employ the sequential approach when considering the site layout and an appropriately detailed site-specific FRA must be submitted at development management stage. **Site 7**: These lands are zoned 'Regeneration' (D1), affected by fluvial and coastal flooding and are in Flood Zones A and B. The lands are identified as the Northern Inner Quays and are characterised by a wide and varied range of existing uses including retail, service, commercial, storage, residential and port related activities (associated with Drogheda Port). There are pockets of dereliction, vacancy and under-utilisation of serviced urban lands within this site which illustrates how this portion of the town has lost its purpose and is underperforming. In response, the area is specifically earmarked as a location with regeneration potential for the town to deliver compact growth through the development of the vacant and under-utilised lands in an appropriate and sustainable manner. Regeneration of these lands will facilitate the creation of a new urban quarter on the northern banks of the Boyne, which will be helped if and when proposals for consolidation of Drogheda Port at the deepwater facility of Tom Roes Point and the construction of the PANCR are realised. Development of these brownfield lands will deliver economic, social and environmental benefits to the town. It will revitalise the general area creating an attractive and vibrant living space in the centre of the town, encourage expansion of economic development, consolidate the town, deliver compact, sequential and sustainable growth, build on existing assets and improve accessibility and transition to sustainable modes of transport. Collectively this will act as a catalyst for further development of the Town in line with its designation as Regional Growth Centre. These are clearly brownfield lands and any development thereon will be infill in nature. **Infill Lands**: A Justification Test was not carried out on these lands as they are already developed. Further development on the lands will be of an infill/brownfield nature. Within areas of existing development, proposals for extensions and minor development shall be assessed with reference to Section 5.28 of the Planning System and Flood Risk Management Guidelines, in accordance with Policies IU 26-IU 35 of the LCDP. Any highly vulnerable or less vulnerable land uses affected by Flood Zone A or B should employ the sequential approach when considering the site layout and an appropriately detailed site-specific FRA must be submitted at development management stage. **Site 8**: These lands are zoned 'Regeneration' (D1), affected by fluvial and coastal flooding and are in Flood Zones A and B. These lands are identified as the Southern Inner Quays. A disparate range of uses typify the site but as brownfield lands, they are characterised by a very high level of vacancy, dereliction and under-utilisation of serviced urban lands which illustrates how this area of the town has lost its purpose and is underperforming. In response, the area is specifically earmarked as a location with regeneration potential for the town to create a new urban quarter and deliver compact growth through the development of the vacant and under-utilised lands in an appropriate and sustainable manner. Regeneration will facilitate the creation of a new urban quarter on the southern banks of the Boyne. Development of these brownfield lands will deliver economic, social and environmental benefits to the town. It will revitalise the general area creating an attractive and vibrant living space in the centre of the town, encourage expansion of economic development, consolidate the town, deliver compact, sequential and sustainable growth, build on existing assets and improve accessibility and transition to sustainable modes of transport. Collectively this will act as a catalyst for further development of the Town in line with its designation as Regional Growth Centre. These are clearly brownfield lands and any development thereon will be infill in nature. **Infill Lands**: A Justification Test was not carried out on these lands as they are already developed. Further development on the lands will be of an infill/brownfield nature.

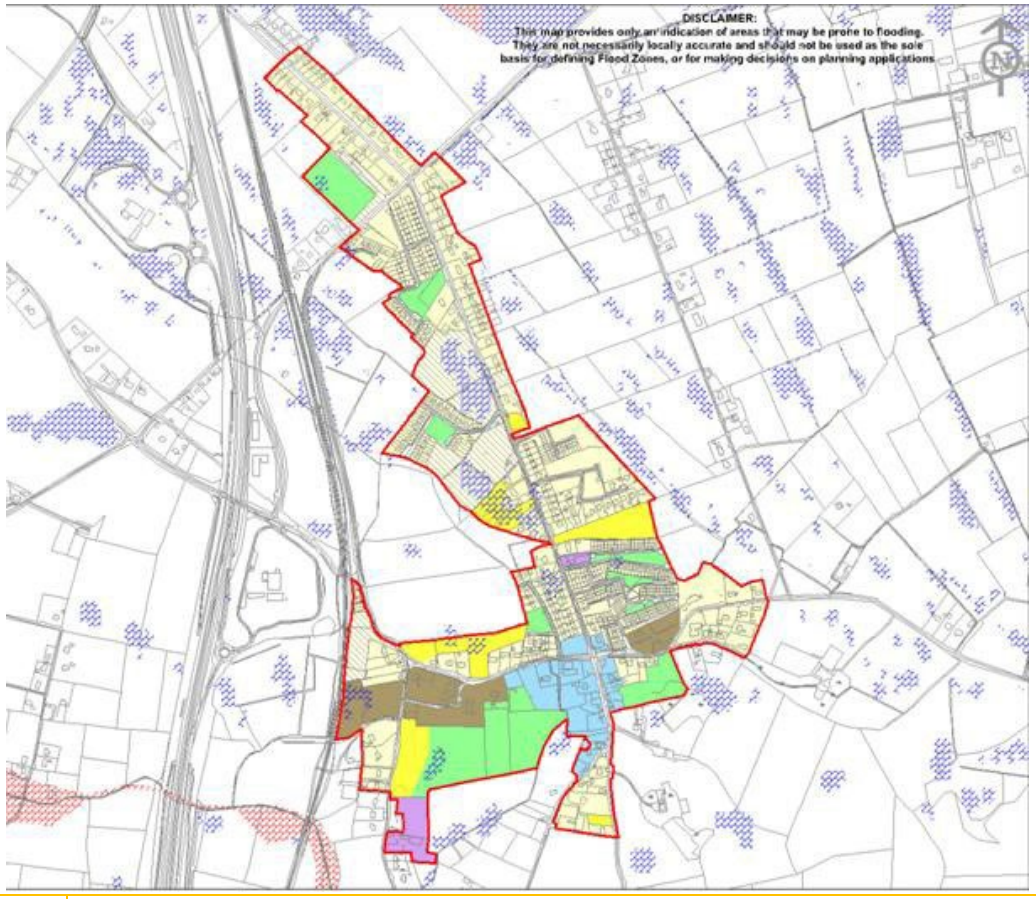
	Within areas of existing development, proposals for extensions and minor development shall be assessed with reference to Section 5.28 of the Planning System and Flood Risk Management Guidelines, in accordance with Policies IU 26-IU 35 of the LCDP. Any highly vulnerable or less vulnerable land uses affected by Flood Zone A or B should employ the sequential approach when considering the site layout and an appropriately detailed site-specific FRA must be submitted at development management stage. **Site 9**: These lands are zoned 'General Employment' (E1), to provide for general enterprise and employment generating activities. The lands are vulnerable to fluvial and coastal flooding and are in Flood Zones A and B. These lands are characterised by existing commercial and emergency services development. Flogas Ireland located on the eastern most boundary of the site is identified as an Upper Tier Seveso establishment wherein the advised consultation distance with the HSA is a 600m requirement. As a substantial portion of these zoned lands is not identified for potential flood risk and is located within Flood Zone C it is anticipated that flood risk mitigation measures could be designed to allow development of the wider site, as necessary. Development of the site will require a site-specific FRA which should consider the sequential approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009. **Site 10**: This refers to lands zoned 'General Employment' (E1) to provide for general enterprise and employment generating activities. The lands are vulnerable to fluvial and coastal flooding and are in Flood Zone A. These are clearly brownfield lands with extant employment generating businesses and any development thereon will be infill in nature. **Infill Lands**: A Justification Test was not carried out on these lands as they are already developed. Further development on the lands will be of an infill/brownfield nature. Within areas of existing development, proposals for extensions and minor development shall be assessed with reference to Section 5.28 of the Planning System and Flood Risk Management Guidelines, in accordance with Policies IU 26-IU 35 of the LCDP. Any highly vulnerable or less vulnerable land uses affected by Flood Zone A or B should employ the sequential approach when considering the site layout and an appropriately detailed site-specific FRA must be submitted at development management stage. **Site 11**: These lands are zoned 'Business and Technology' (E2), are vulnerable to fluvial and coastal flooding and are in Flood Zones A and B. There are existing buildings on the site and these are clearly brownfield lands. As a substantial portion of these zoned lands is not identified as being vulnerable to flooding and is located within Flood Zone C it is anticipated that flood risk mitigation measures will be designed to allow development of the wider site, as necessary. Development of the site will require a site-specific FRA which should consider the sequential approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009.
Criteria 3	A detailed site-specific FRA shall be submitted with any planning application to address flood risk, propose mitigation measures and assign appropriate development. A site-specific FRA should address the following: • A sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain. • Highly Vulnerable Development shall not be permitted in Flood Zone A or B. • Development in Flood Zone A should be either open space or water compatible. • FRA should address residual risk of culvert blockage (where applicable), increased flood extents under climate change scenarios and pluvial risk which should be aimed at setting finished floor levels. • Compensatory storage for development that results in a loss of floodplain within Flood Zone A must be provided on a level for level basis.

Conclusion	**Site 1** Justification Test satisfied. **Site 2** Justification Test satisfied. **Site 3** Justification Test satisfied. **Site 4** Justification Test satisfied. **Site 5** Justification Test satisfied. **Site 6** Justification Test satisfied. **Site 7** Justification Test satisfied. **Site 8** Justification Test satisfied. **Site 9** Justification Test satisfied. **Site 10** Justification Test satisfied. **Site 11** Justification Test satisfied. It is recommended that any proposals for future development on lands vulnerable to flooding and in Flood Zones A and B will be subject to a site-specific FRA to ensure that development is appropriate and satisfies Criteria 3 of the Justification Test.

Dromiskin

Hierarchy	Small Towns and Villages
Area for Further Assessment under the CFRAM Programme	No

Map



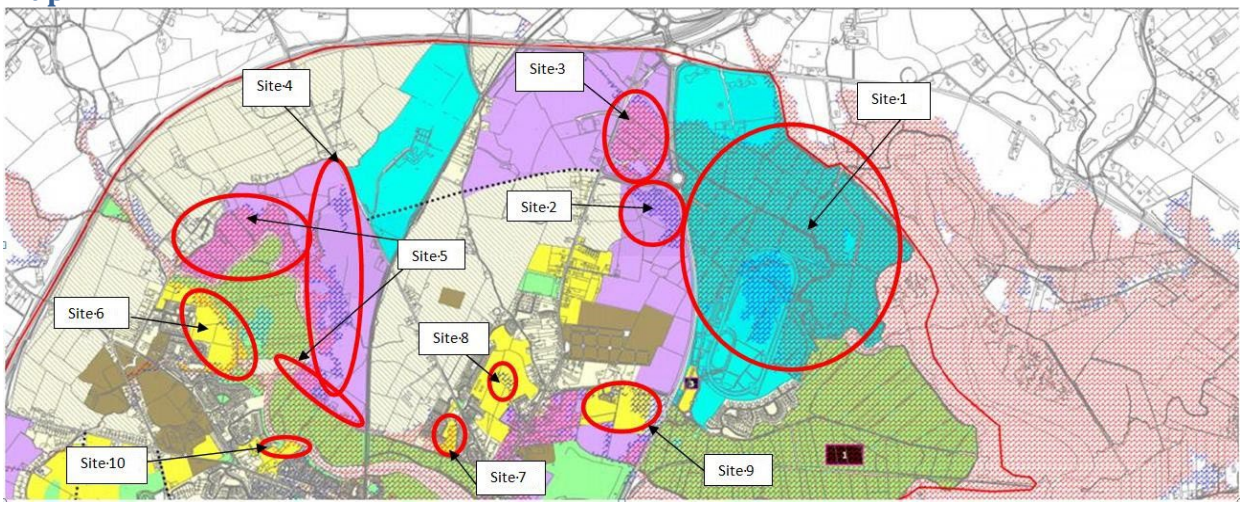
Criteria 1	Dromiskin in the Louth Settlement Strategy is identified as Level 4 'Small Towns and Villages'. The Core and Growth Strategies both focus on ensuring localised sustainable growth proportionate to the size of the settlement, prioritised on infill/brownfield sites with support for economic related development that strengthens the local employment base and reduces dependence on commuting. Dromiskin has a weak employment base with a dependence on outbound commuting. In support of these strategies, the corresponding Policy Objectives seek to facilitate balanced and proportionate population and economic growth to meet the needs of the residents of the settlements while creating vibrant rural communities through the promotion and targeting of sustainable development. The rejuvenation of vacant and underutilised lands for appropriate uses is also encouraged. The Preliminary Flood Risk Assessment (PFRA) mapping undertaken by the OPW (2011) identifies lands within Dromiskin development boundary at potential flood risk. The PFRA considered flooding from a number of sources including fluvial, pluvial, tidal and groundwater with associated Flood Zones A and B identified. It is acknowledged that the areas identified should be treated with caution due to the indicative nature of the PFRA mapping.
Criteria 2	In Dromiskin there are lands zoned 'Existing Residential' (A1), 'New Residential' (A2) and 'Community Facilities' (G1) indicated as being vulnerable to pluvial flooding in the PFRA. With the introduction of a new mapping layer to all settlements in County Louth specifically identifying pluvial flooding, the designation of Flood Zones in this regard will no longer be applicable. (See Section 10.3.1 and 10.3.2 of the Plan for explanation).

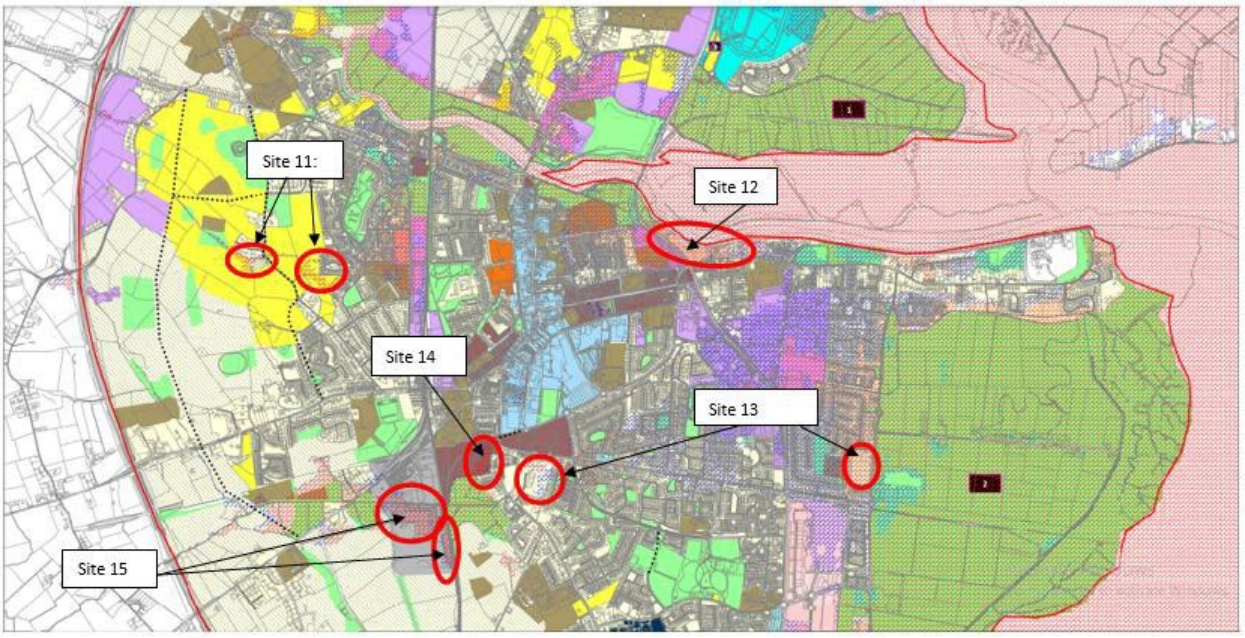
Criteria 3	No fluvial or coastal flooding
Conclusion	Given the indicative pluvial flood risk highlighted by the PFRA, any proposed development within Dromiskin Village should consider the management and disposal of surface water in compliance with SuDS principles and in line with approved policy objectives of the Development Plan.

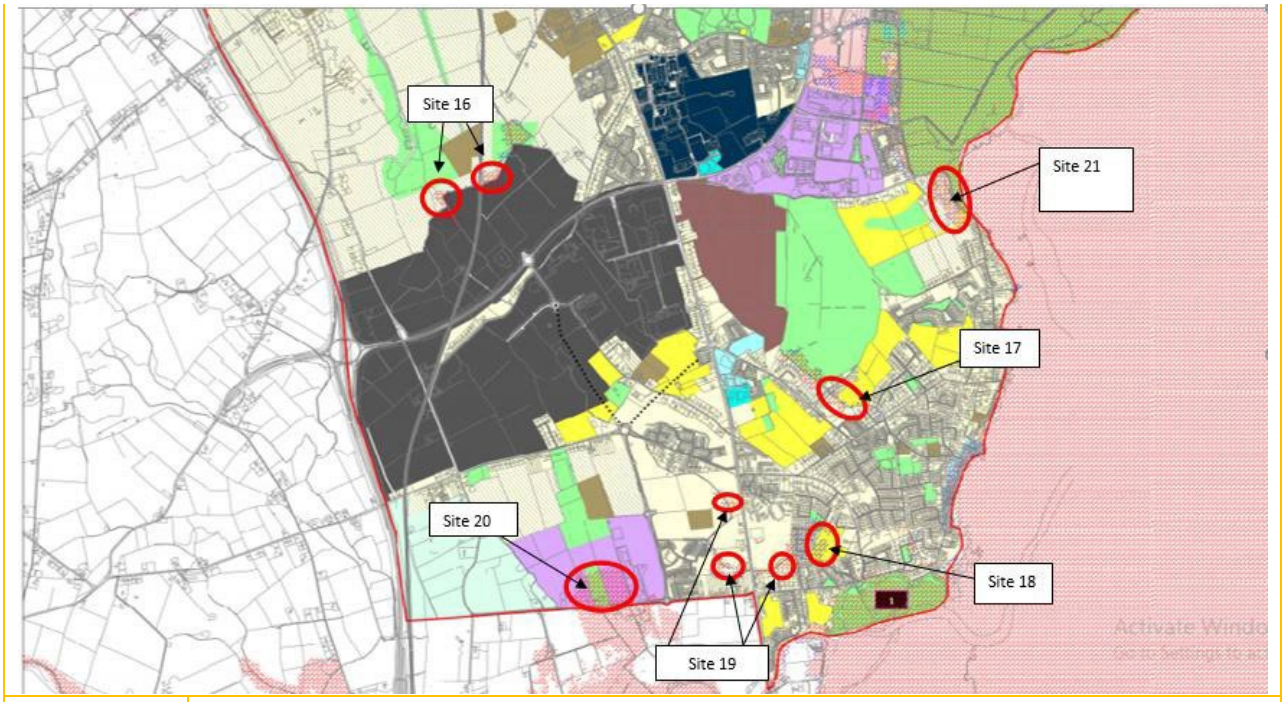
Dundalk

Hierarchy	Regional Growth Centre
Area for Further Assessment under the CFRAM Programme	Yes

Map







Criteria 1	In line with the National Planning Framework, the Regional Spatial and Economic Strategy for the Eastern and Midland Region has, in its Settlement Hierarchy identified Dundalk as a Regional Growth Centre (RGC). It acknowledges it as a town with high level self-sustaining employment and services which act as regional economic drivers while playing a significant role for a wide catchment area. It supports significant population and economic growth in these centres, which is critical to the implementation of effective regional development. A key priority is to promote the continued sustainable and compact growth of Dundalk as a regional driver of city scale with a target population of 50,000 by 2031. It identifies a strategic development framework for the future growth of the town to allow it reach sufficient scale, to be a driver of regional growth and in recognition of its critical role in successful regional development. Dundalk, as one of eight identified 'Areas for Further Assessment', was subject to the CFRAM programme with associated Flood Zones A and B identified.
Criteria 2	**Site 1**: These lands are zoned 'Tourism and Leisure' (I1) wherein a substantial portion of the lands are identified as vulnerable to fluvial and coastal flooding and are in Flood Zone A with a smaller portion (primarily located within the existing racetrack) in Flood Zone B. In terms of the uses which are generally permitted within this land use zoning category, these include for uses which fall primarily into the category of water compatible development or less vulnerable development which include for tourist attractions and amenities and development that contributes to the enjoyment of recreation and leisure activity. The Plan promotes tourism as a key economic pillar of the County's economy and major generator of employment supporting the provision of a significant increase in facilities and visitor attractions. As a portion of these zoned lands is not identified as being vulnerable to flooding and is located within Flood Zone C, it is anticipated that flood risk mitigation measures could be designed to allow development of the wider site, as necessary. Development of the site will require a site - specific FRA which should consider the sequential approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009.

Site 2: Refers to lands zoned 'General Employment' (E1) which are vulnerable to coastal flooding and are entirely in Flood Zone B. These lands (northern most section) were subject to an application for dumping and spreading of soil and stone waste for agricultural activities (Reg. Ref. No. 18/556).The application was accompanied by a site-specific FRA, deemed to adequately mitigate against flood risk and was granted planning permission by LCC.

Regarding the remainder of the lands, a substantial portion is not identified as being vulnerable to flooding and is located within Flood Zone C. It is anticipated that flood risk mitigation measures could be designed to allow development of the wider site, as necessary. Development of the site will require a site-specific FRA which should consider the sequential approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009.

Site 3: Rezone lands zoned 'General Employment' (E1) which are vulnerable to fluvial and coastal flooding and in Flood Zones A and B. The uses generally permitted within this land use category are not appropriate for Flood Zones A and B. It is considered that the application of the Justification Test is not appropriate on this occasion. Rezone these lands to Strategic Reserve.

Site 4: Refers to lands zoned 'General Employment' (E1) which are vulnerable to fluvial and coastal flooding and are in Flood Zones A and B. Planning permission for the development of these lands was granted permission by Louth County Council and subsequent extensions of duration under a series of applications.

Site 5: Rezone lands zoned 'General Employment' (E1) which are vulnerable to fluvial and coastal flooding and in Flood Zones A and B. The uses generally permitted within this land use category are not appropriate for Flood Zones A and B. It is considered that the application of the Justification Test is not appropriate on this occasion. Rezone these lands to 'Open Space' (H1), mirroring the open space lands to the south, which will provide for recreational and amenity along this length of the Castletown River.

Site 6: Rezone lands 'New Residential' (A2) which are vulnerable to fluvial and coastal flooding and in Flood Zones A and B, as the primary provision of residential development on these lands is not appropriate. Rezone the lands to 'Open Space' (H1) which will tie in with the existing open space along this stretch of the Castletown River.

Site 7: These lands are zoned 'New Residential' (A2) indicated as vulnerable to fluvial flooding, and in Flood Zone A. Planning permission was granted for the development of these lands under a series of planning applications Reg. Ref. No's. 18/707, 19/233 and 20/310. Each application was accompanied by a site-specific FRA, deemed to adequately mitigate against flood risk. Planning permission was granted for each application by LCC.

Site 8: Rezone lands 'New Residential' (A2) which are vulnerable to coastal flooding and in Flood Zone A, as the primary provision of residential development on these lands is not appropriate. Rezone the lands to 'Open Space' (H1)

Site 9: Rezone lands 'New Residential' (A2) which are vulnerable to coastal flooding and in Flood Zone B, as the primary provision of residential development on these lands is not appropriate. Rezone the lands to 'Open Space' (H1).

Site 10: Rezone lands 'New Residential' (A2) which are vulnerable to fluvial and coastal flooding and in Flood Zone A, as the primary provision of residential development on these lands is not appropriate. Rezone the lands to 'Open Space' (H1).

This open space will tie in with the open space to the east and west associated with Castleross and Saltown respectively.

Site 11: Rezone lands 'New Residential' (A2) which are vulnerable to fluvial and coastal flooding and in Flood Zone A, as the primary provision of residential development on these lands is not appropriate. Rezone the lands to 'Open Space' (H1).

	Site 12: The lands zoned 'Port Harbour Area' (C2), are vulnerable to fluvial and coastal flooding and are in Flood Zones A and B. The site is characterised by existing development which is commercial in nature associated with a working port alongside ancillary development which has evolved including retail, storage, warehousing etc. The zoning of these lands and supporting policy objectives (including the RSES) seek to provide for the consolidation of port activities in addition to realising new opportunities for development to maximize the strategic location of the lands in relation to the town centre. This area has been identified as a Regeneration Area in the anticipation that it will act as a stimulus for further development activities. Notwithstanding the existing activities on site, there are large areas currently vacant and therefore underutilised. Given the close proximity to the town centre, there is potential for these lands to be developed to complement the town centre, promote compact development and revitalise this part of the town. The lands are clearly brownfield lands and any development thereon will be infill in nature. **Infill Lands**: Lands within the 'Port Harbour Area' are characterised by existing buildings and structures with a range of varying uses. A Justification Test was not carried out on these lands as they are already developed. Further development on the lands will be of an infill/brownfield nature. Within areas of existing development, proposals for extensions and minor development shall be assessed with reference to Section 5.28 of the Planning System and Flood Risk Management Guidelines, in accordance with Policies IU 26-IU 35 of the LCDP. Any highly vulnerable or less vulnerable land uses affected by Flood Zone A or B should employ the sequential approach when considering the site layout and an appropriately detailed site-specific FRA must be submitted at development management stage. **Site 13**: This comprises two disparate parcels of land both of which are zoned 'Existing Residential' (A1). The site located on the Red Barns Road is vulnerable to coastal flooding and is in Flood Zone A. These lands are surrounded on all but one boundary by existing established in-depth residential development and presently represent under-utilisation of these lands within the established and built up area of Dundalk. The site off the Dublin Road (and west of Dunmore) is vulnerable to fluvial and coastal flooding and in Flood Zones A and B. These lands currently house existing residential development including standalone student accommodation and previous commercial development. The lands are brownfield and under-utilised. The development of both parcels of land will realise consolidation and deliver compact growth. Simultaneously, it will promote sequential and sustainable development of existing lands in an established built up area of the town. Compact forms of growth such as this can bring more life and footfall, contribute to the viability of services and public transport, increase housing supply in a serviced area and enable people to be closer to employment and recreational opportunities. Development of the Red Barns Road lands will require a site-specific FRA to adequately and satisfactorily mitigate against flood risk. As a substantial portion of the lands off the Dublin Road is not identified as being vulnerable to flooding and is located within Flood Zone C, it is anticipated that flood risk mitigation measures could be designed to allow development of the wider site, as necessary. Development of the site will require a site-specific FRA which should consider the sequential approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009. **Site 14**: These lands are zoned 'Mixed Use' (C1) to provide for commercial, business and supporting residential uses. The lands are vulnerable to fluvial and coastal flooding and are in Flood Zones A and B. These lands immediately adjoin the town centre and are essential to the expansion of the centre of the town. Given the location of these lands adjoining the town centre and surrounded by existing, and long established in-depth development, they represent under-utilisation of urban lands and infrastructure within the built up area of Dundalk.

The development of these lands will provide for consolidation of the core and deliver sustainable, compact growth. The primary provision of commercial and business uses on this site will revitalise this area of the town and contribute to the viability of services and public transport while enabling people to be closer to employment.

As a substantial portion of the 'Mixed Use' land is not identified as being vulnerable to flooding and is located within Flood Zone C, it is anticipated that flood risk mitigation measures could be designed to allow development of the wider site, as necessary. Development of the site will require a site-specific FRA which should consider the sequential approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009.

Site 15: This refers to lands zoned 'Transportation Development Hub' (J1) to provide for mixed use development commensurate with a transportation hub. The lands are vulnerable to fluvial and coastal flooding and are in Flood Zones A and B. These brownfield lands are historically connected and linked to the railway and its ancillary uses and are currently, primarily characterised by industrial/manufacturing development with a long established residential element along the Ardee Road boundary. The substantial lands vulnerable to flooding are currently developed.

As a substantial portion of the 'Transportation Development Hub' land is not identified as being vulnerable to flooding and is located within Flood Zone C, it is anticipated that flood risk mitigation measures could be designed to allow development of the wider site, as necessary. Development of the site will require a site-specific FRA which should consider the sequential approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009.

Site 16: This refers to land zoned 'Business and Technology', vulnerable to fluvial and coastal flooding and in Flood Zone A. The uses generally permitted within this land use category are not appropriate for Flood Zone A. It is considered that the application of the Justification Test is not appropriate on this occasion. Rezone these lands to 'Open Space'.

Site 17: Rezone lands 'New Residential' (A2) and 'Existing Residential' which are vulnerable to fluvial and coastal flooding and are in Flood Zone B, as the primary provision of residential development on these lands is not appropriate. Rezone the lands to 'Open Space' (H1).

Site 18: Rezone lands 'New Residential' (A2), vulnerable to coastal flooding and in Flood Zone B, as the primary provision of residential development on these lands is not appropriate. Rezone the lands to 'Open Space' (H1).

Site 19: These lands are zoned 'Existing Residential' (A1), are vulnerable to fluvial and coastal flooding and are in Flood Zones A and B. There are extant permissions on these lands with construction work currently ongoing within the overall sites. Any future applications for a change to these permissions will be subject to a site-specific FRA.

Herein, as the substantial portion of the 'Existing Residential' land is not identified as being vulnerable to flooding and is located within Flood Zone C, it is anticipated that flood risk mitigation measures could be designed to allow development of the wider site, as necessary. Development of the site will require a site-specific FRA which should consider the sequential approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009.

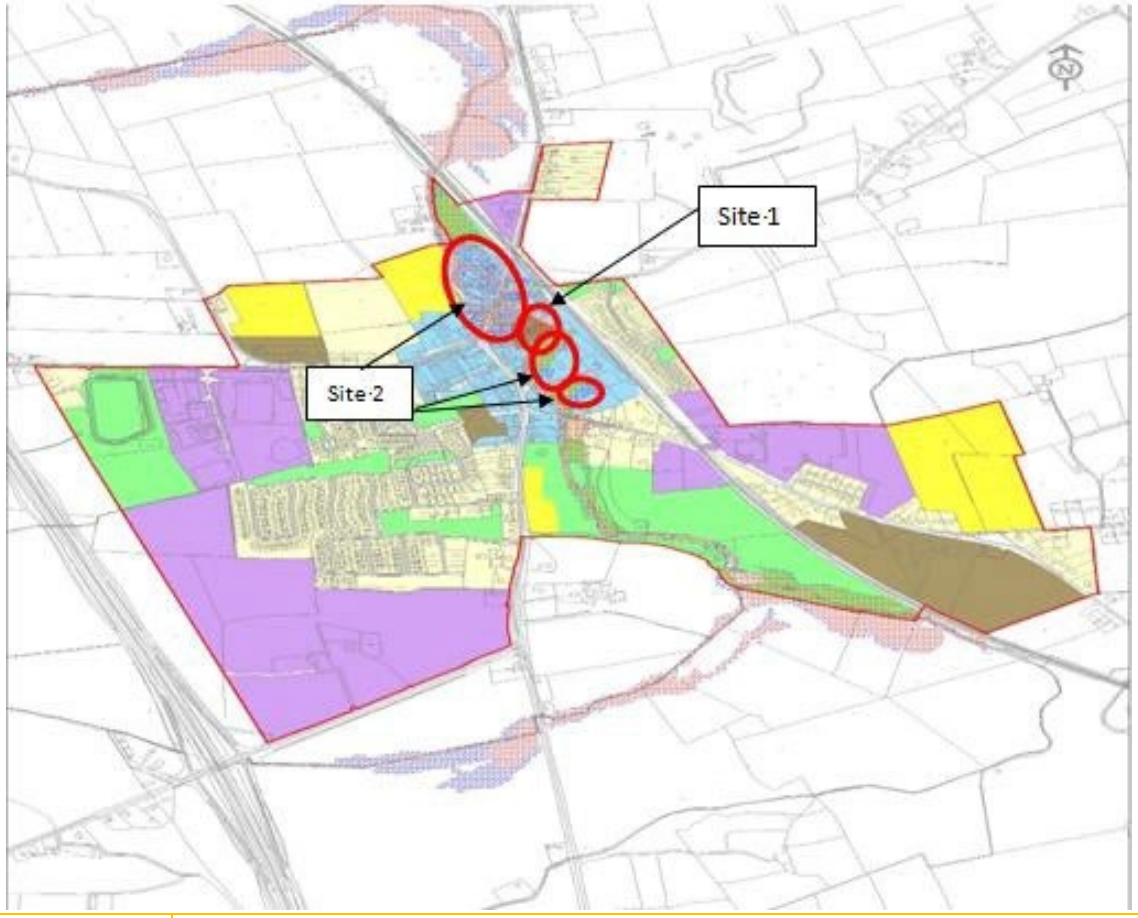
Site 20: These lands are zoned 'General Employment' (E1), are vulnerable to fluvial flooding and are in Flood Zone A. There is an established pattern of development at this location of existing industrial development and the subject lands represent the potential for an extension and consolidation of these uses at this location.

	As a substantial portion of the 'General Employment' land is not identified as being vulnerable to flooding and is located within Flood Zone C, it is anticipated that flood risk mitigation measures could be designed to allow development of the wider site, as necessary. Development of the site will require a site-specific FRA which should consider the sequential approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009. **Site 21**: There is an extant SHD permission on these lands zoned 'New Residential' and the lands affected by flooding refers to the location of the entrance to these lands.
Criteria 3	A detailed site-specific FRA shall be submitted with any planning application to address flood risk, propose mitigation measures and assign appropriate development. A site-specific FRA should address the following: • A sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain. • Highly Vulnerable Development shall not be permitted in Flood Zone A or B. • Development in Flood Zone A should be either open space or water compatible. • FRA should address residual risk of culvert blockage (where applicable), increased flood extents under climate change scenarios and pluvial risk which should be aimed at setting finished floor levels. • Compensatory storage for development that results in a loss of floodplain within Flood Zone A must be provided on a level for level basis.
Conclusion	**Site 1** Justification Test satisfied. **Site 2** Justification Test satisfied. **Site 3** Justification Test failed. Rezone to Strategic Reserve. **Site 4** Extant planning permission on this site. **Site 5** Justification Test failed. Rezone Open Space. **Site 6** Justification Test failed. Rezone Open Space. **Site 7** Extant planning permission on this site accompanied by a site-specific FRA. **Site 8** Justification Test failed. Rezone Open Space. **Site 9** Justification Test failed. Rezone Open Space. **Site 10** Justification Test failed. Rezone Open Space. **Site 11** Justification Test failed. Rezone Open Space. **Site 12** Justification Test satisfied. **Site 13** Justification Test satisfied. **Site 14** Justification Test satisfied. **Site 15** Justification Test satisfied. **Site 16** Justification Test failed. Rezone Open Space. **Site 17** Justification Test failed. Rezone Open Space. **Site 18** Justification Test failed. Rezone Open Space. **Site 19** Justification Test satisfied. **Site 20** Justification Test satisfied. **Site 21** Justification Test satisfied. It is recommended that any proposals for future development on lands vulnerable to flooding and in Flood Zones A and B will be subject to a site-specific FRA to ensure that development is appropriate and satisfies Criteria 3 of the Justification Test.

Dunleer

Hierarchy	Self Sustaining Growth Town
Area for Further Assessment under the CFRAM Programme	No. Dunleer Flood Risk Management Plan

Map



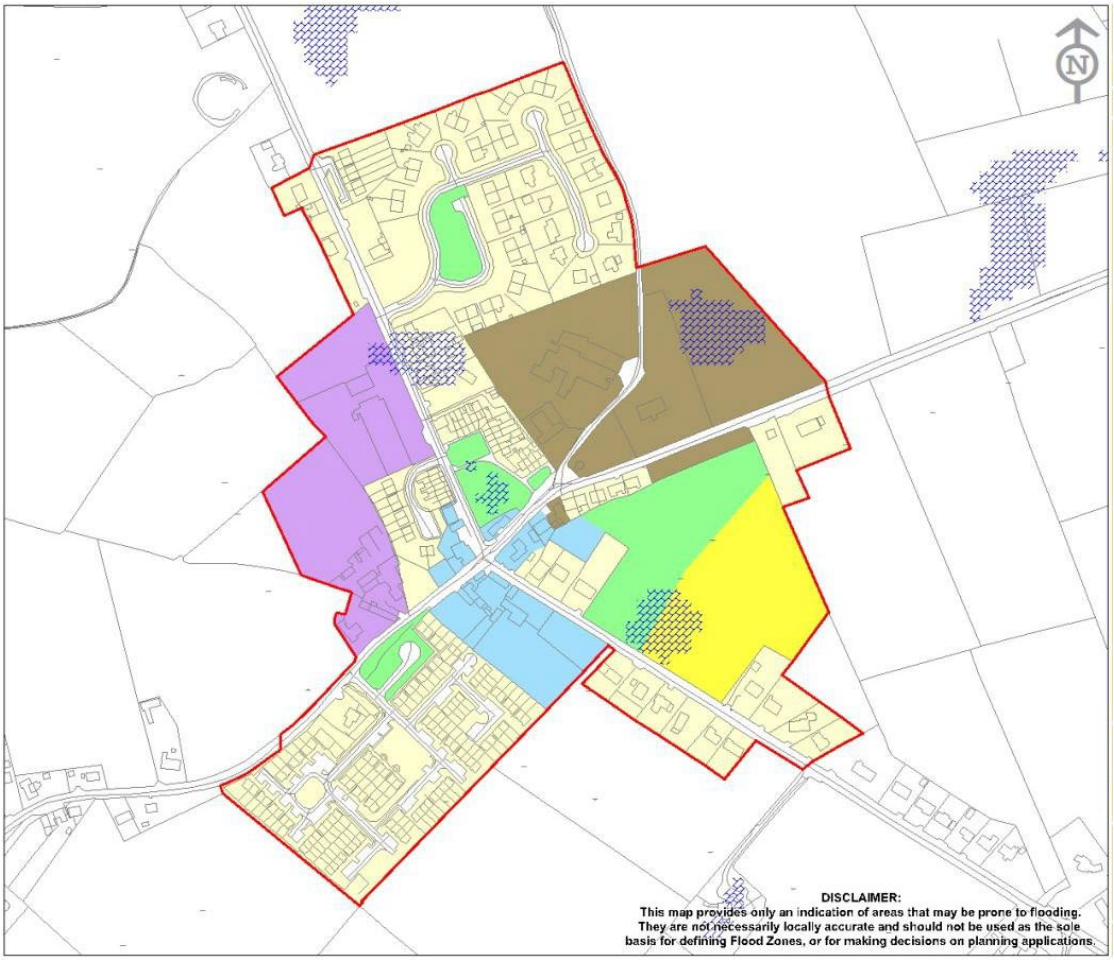
Criteria 1	The Louth County Development Plan Settlement Strategy identifies Dunleer as a 'Self-Sustaining Growth Town' in line with the criteria and informed by the principal elements of the RSES. Louth's growth strategy seeks to support Dunleer as a regionally important local driver providing a moderate level of jobs and services for the resident population and the surrounding catchments. In line with national and regional policy, growth will be both balanced and at sustainable levels with particular emphasis on infill and brownfield development, with commensurate delivery of employment and services and improving the quality of life for all in the town. The Plan in its policy objectives promotes the consolidation of vacant and/or under-utilised infill and brownfield lands, which will revitalise and reduce the vacancy in the town centre area and provide for town centre living. Economic and employment related development will be concentrated in the established employment areas of the town while future residential will promote connectivity and permeability to meet the residential needs of all members of the community. Dunleer has a strong employment sector, where there are more jobs than resident workers and with the highest Jobs: Workforce Ratio in the County. While Dunleer was not identified as an Area for Further Assessment there was a Dunleer Flood Risk Management Plan prepared.

Criteria 2	**Site 1**: The lands are zoned 'Community Facilities' the objective of which is to provide for and protect civic, religious, community, education, health care and social infrastructure. These lands are subject primarily to Flood Zone A interspersed with parcels subject to Flood Zone B. This site has a rich architectural and archaeological history and is home to both a Protected Structure (Dunleer Church of Ireland) and a series of protected National Monuments, contained within a Zone of Archaeological Potential, the policy objective of which is to protect both the structures and their setting. It is considered that due to the existing heritage elements on the site, that the future development of these lands may be somewhat constrained and infill in nature. **Site 2**: These lands zoned 'Town or Village Centre' are characterised by existing development, on brownfield sites, supporting a varying range of uses. Development within this site will therefore be infill in nature. Such infill development is essential to fully realise the implementation of the policy objectives which seek to support the role of Dunleer as a Self-Sustaining Growth Town, facilitating balanced population and economic growth to meet the needs of the residents of the town and its hinterland. Such infill development will consolidate the town core by strengthening the commercial and residential town centre sector whilst encouraging development which will contribute to its character and meet the needs of the community. Development of these lands will support the town centre as the priority location for new commercial and mixed use development thus promoting compact, sustainable development and reducing the need to travel by car. **Infill Lands**: Lands within the existing settlement and zoned 'Town or Village Centre', 'Community Facilities' and 'Existing Residential' are characterised by existing buildings and structures with a range of varying uses. A Justification Test was not carried out on these lands as they are already developed. Further development on the lands will be of an infill/brownfield nature. Within areas of existing development, proposals for extensions and minor development shall be assessed with reference to Section 5.28 of the Planning System and Flood Risk Management Guidelines, in accordance with Policies IU 26-IU 35 of the LCDP. Any highly vulnerable or less vulnerable land uses affected by Flood Zone A or B should employ the sequential approach when considering the site layout and an appropriately detailed site-specific FRA must be submitted at development management stage.
Criteria 3	A detailed site-specific FRA shall be submitted with any planning application to address flood risk, propose mitigation measures and assign appropriate development. A site-specific FRA should address the following: • A sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain. • Highly Vulnerable Development shall not be permitted in Flood Zone A or B. • Development in Flood Zone A should be either open space or water compatible. • FRA should address residual risk of culvert blockage (where applicable), increased flood extents under climate change scenarios and pluvial risk which should be aimed at setting finished floor levels. • Compensatory storage for development that results in a loss of floodplain within Flood Zone A must be provided on a level for level basis.
Conclusion	**Site 1** Justification Test satisfied. **Site 2** Justification test satisfied. It is recommended that any proposals for future development on lands vulnerable to flooding and in Flood Zones A and B will be subject to a site-specific FRA to ensure that development is appropriate and satisfies Criteria 3 of the Justification Test.

Knockbridge

Hierarchy	Small Towns and Villages
Area for Further Assessment under the CFRAM Programme	No

Map



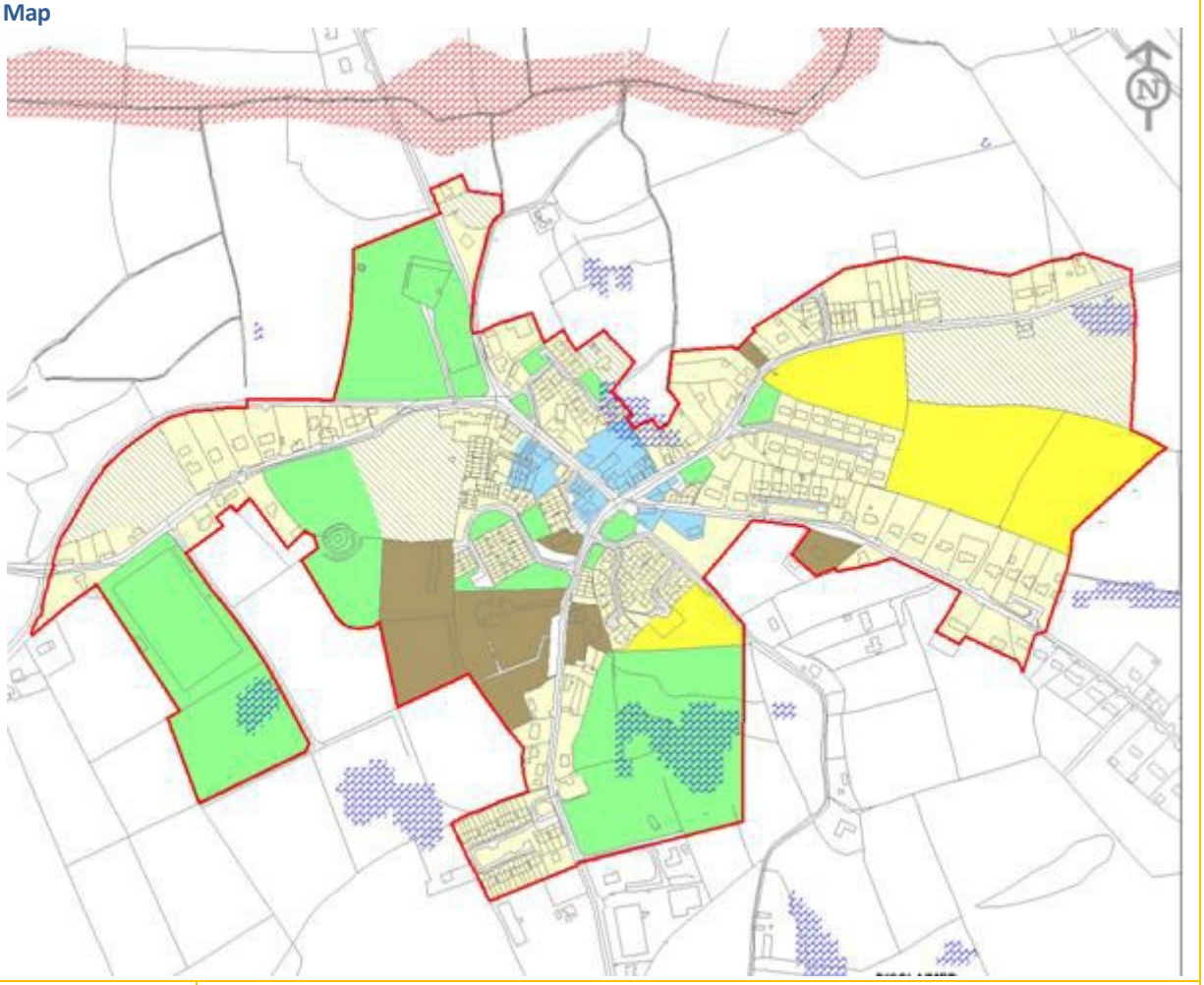
Criteria 1	Knockbridge in the Louth Settlement Strategy is identified as Level 4 'Small Towns and Villages'. The Core and Growth Strategies both focus on ensuring localised sustainable growth proportionate to the size of the settlement, prioritised on infill/brownfield sites with support for economic related development that strengthens the local employment base and reduces dependence on commuting. Knockbridge has a weak employment base with a dependence on outbound commuting. In support of these strategies, the corresponding Policy Objectives seek to facilitate balanced and proportionate population and economic growth to meet the needs of the residents of the settlements while creating vibrant rural communities through the promotion and targeting of sustainable development. The rejuvenation of vacant and underutilised lands for appropriate uses is also encouraged. The Preliminary Flood Risk Assessment (PFRA) mapping undertaken by the OPW (2011) identifies lands within Knockbridge development boundary at potential flood risk. The PFRA considered flooding from a number of sources including fluvial, pluvial, tidal and groundwater with associated Flood Zones A and B identified. It is acknowledged that the areas identified should be treated with caution due to the indicative nature of the PFRA mapping.

Criteria 2	In Knockbridge there are lands zoned 'Existing Residential' (A1), 'New Residential' (A2) and 'Community Facilities' (G1) indicated as being vulnerable to pluvial flooding in the PFRA. With the introduction of a new mapping layer to all settlements in County Louth specifically identifying pluvial flooding, the designation of Flood Zones in this regard will no longer be applicable. (See Section 10.3.1 and 10.3.2 of the Plan for explanation).
Criteria 3	No fluvial or coastal flooding.
Conclusion	Given the indicative pluvial flood risk highlighted by the PFRA, any proposed development within Knockbridge Village should consider the management and disposal of surface water in compliance with SuDS principles and in line with approved policy objectives of the Development Plan.

Louth Village

Hierarchy	Small Towns and Villages
Area for Further Assessment under the CFRAM Programme	No

Map



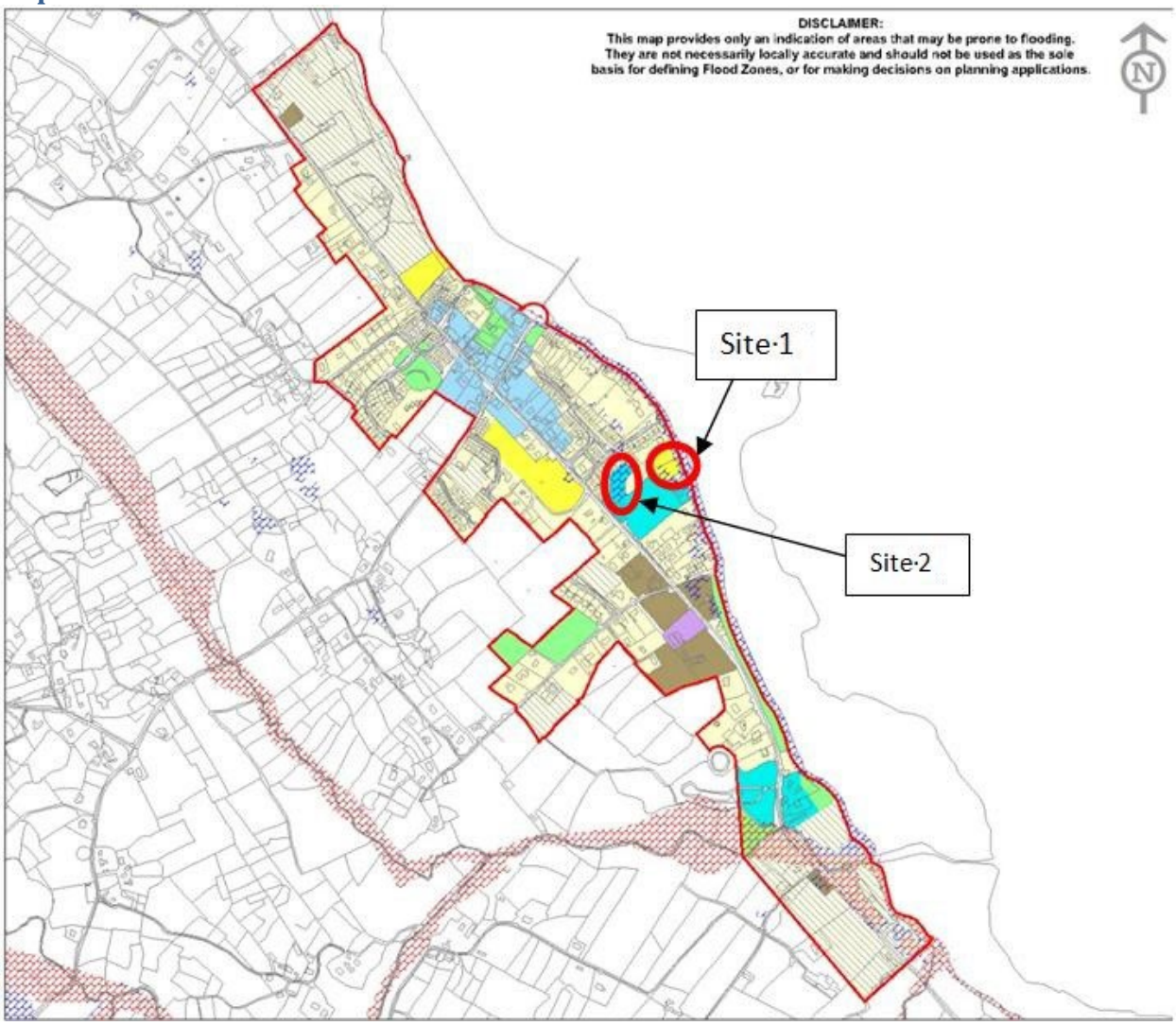
Criteria 1	Louth Village in the Louth Settlement Strategy is identified as Level 4 'Small Towns and Villages'. The Core and Growth Strategies both focus on ensuring localised sustainable growth proportionate to the size of the settlement, prioritised on infill/brownfield sites with support for economic related development that strengthens the local employment base and reduces dependence on commuting. Louth has a weak employment base with a dependence on outbound commuting. In support of these strategies, the corresponding Policy Objectives seek to facilitate balanced and proportionate population and economic growth to meet the needs of the residents of the settlements while creating vibrant rural communities through the promotion and targeting of sustainable development. The rejuvenation of vacant and underutilised lands for appropriate uses is also encouraged. The Preliminary Flood Risk Assessment (PFRA) mapping undertaken by the OPW (2011) identifies lands within Louth Village development boundary at potential flood risk. The PFRA considered flooding from a number of sources including fluvial, pluvial, tidal and groundwater with associated Flood Zones A and B identified. It is acknowledged that the areas identified should be treated with caution due to the indicative nature of the PFRA mapping.

Criteria 2	In Louth Village there are lands zoned 'Existing Residential' (A1) and 'Town or Village' (B1) indicated as being vulnerable to pluvial flooding in the PFRA. With the introduction of a new mapping layer to all settlements in County Louth specifically identifying pluvial flooding, the designation of Flood Zones in this regard will no longer be applicable. (See Section 10.3.1 and 10.3.2 of the Plan for explanation).
Criteria 3	No fluvial or coastal flooding
Conclusion	Given the indicative pluvial flood risk highlighted by the PFRA, any proposed development within Louth Village should consider the management and disposal of surface water in compliance with SuDS principles and in line with approved policy objectives of the Development Plan.

Omeath

Hierarchy	Small Towns and Villages
Area for Further Assessment under the CFRAM Programme	No

Map



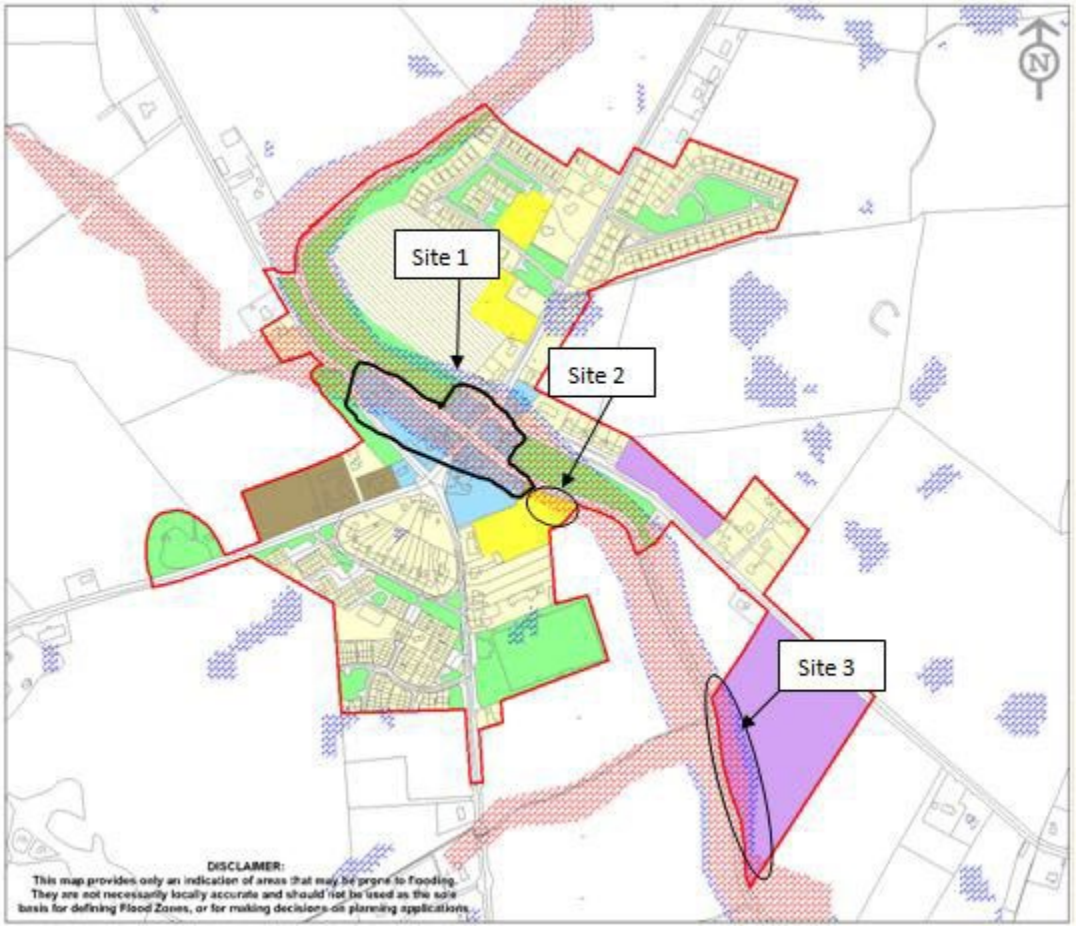
Criteria 1	Omeath in the Louth Settlement Strategy is identified as Level 4 'Small Towns and Villages'. The Core and Growth Strategies both focus on ensuring localised sustainable growth proportionate to the size of the settlement, prioritised on infill/brownfield sites with support for economic related development that strengthens the local employment base and reduces dependence on commuting. Omeath has a weak employment base with a dependence on outbound commuting. In support of these strategies, the corresponding Policy Objectives seek to facilitate balanced and proportionate population and economic growth to meet the needs of the residents of the settlements while creating vibrant rural communities through the promotion and targeting of sustainable development. The rejuvenation of vacant and underutilised lands for appropriate uses is also encouraged. The Preliminary Flood Risk Assessment (PFRA) mapping undertaken by the OPW (2011) identifies lands within Omeath development boundary at potential flood risk. The PFRA considered flooding from a number of sources including fluvial, pluvial, tidal and groundwater with associated Flood Zones A and B identified. It is acknowledged that the areas identified

	should be treated with caution due to the indicative nature of the PFRA mapping.
Criteria 2	**Site 1**: These lands are zoned 'New Residential' (A2) and affected by Flood Zone B. The PFRA identifies that a small portion of the site is vulnerable to coastal flooding. As the substantial portion of these zoned lands is not identified for potential flood risk and is located within Flood Zone C it is anticipated that flood risk mitigation measures could be designed to allow development of the wider site, as necessary. Development of the site will require a site-specific FRA which should consider the sequential approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009. **Site 2**: These lands zoned 'Tourism and Leisure' (I1) are subject to Flood Zone B. The uses permitted within this zoning objective fall into the category of less vulnerable development and as such are considered appropriate in terms of lands affected by Flood Zone B. The majority of these zoned lands is not identified for potential flood risk and is located within Flood Zone C. It is anticipated that flood risk mitigation measures could be designed to allow development of the wider site, as necessary. Development of the site will require a site-specific FRA which should consider the sequential approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009. **Infill Lands**: Lands within the existing settlement and zoned 'Existing Residential' (A1) and 'Community Facilities' (G1) are characterised by existing buildings and structures with a range of varying uses. A Justification Test was not carried out on these lands as they are already developed. Further development on the lands will be of an infill/brownfield nature. Within areas of existing development, proposals for extensions and minor development shall be assessed with reference to Section 5.28 of the Planning System and Flood Risk Management Guidelines, in accordance with Policies IU 26-IU 35 of the LCDP. Any highly vulnerable or less vulnerable land uses affected by Flood Zone A or B should employ the sequential approach when considering the site layout and an appropriately detailed site-specific FRA must be submitted at development management stage.
Criteria 3	A detailed site-specific FRA shall be submitted with any planning application to address flood risk, propose mitigation measures and assign appropriate development. A site-specific FRA should address the following: • A sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain. • Highly Vulnerable Development shall not be permitted in Flood Zone A or B. • Development in Flood Zone A should be either open space or water compatible. • FRA should address residual risk of culvert blockage (where applicable), increased flood extents under climate change scenarios and pluvial risk which should be aimed at setting finished floor levels. • Compensatory storage for development that results in a loss of floodplain within Flood Zone A must be provided on a level for level basis.
Conclusion	**Site 1** Justification Test satisfied. **Site 2** Justification Test satisfied. It is recommended that any proposals for future development on lands vulnerable to flooding and in Flood Zones A and B will be subject to a site-specific FRA to ensure that development is appropriate and satisfies Criteria 3 of the Justification Test.

Tallanstown

Hierarchy	Small Towns and Villages
Area for Further Assessment under the CFRAM Programme	No

Map



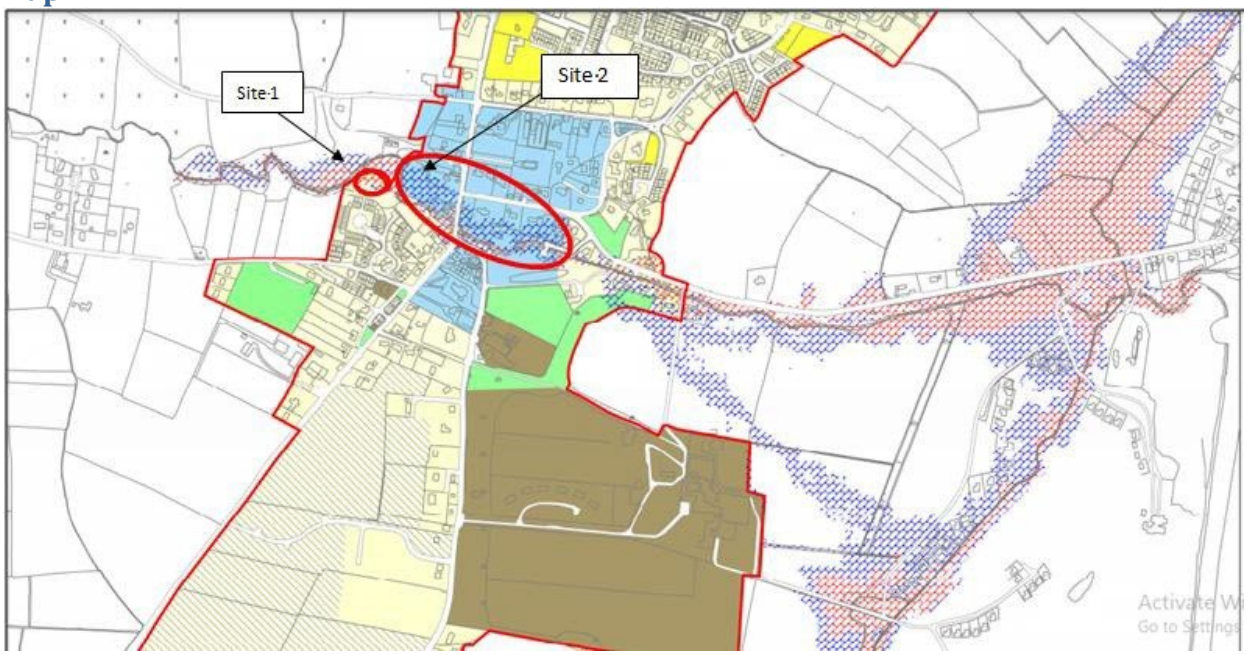
Criteria 1	Tallanstown in the Louth Settlement Strategy is identified as Level 4 'Small Towns and Villages'. The Core and Growth Strategies both focus on ensuring localised sustainable growth proportionate to the size of the settlement, prioritised on infill/brownfield sites with support for economic related development that strengthens the local employment base and reduces dependence on commuting. Tallanstown has a weak employment base with a dependence on outbound commuting. In support of these strategies, the corresponding Policy Objectives seek to facilitate balanced and proportionate population and economic growth to meet the needs of the residents of the settlements while creating vibrant rural communities through the promotion and targeting of sustainable development. The rejuvenation of vacant and underutilised lands for appropriate uses is also encouraged. The Preliminary Flood Risk Assessment (PFRA) mapping undertaken by the OPW (2011) identifies lands within Tallanstown development boundary at potential flood risk. The PFRA considered flooding from a number of sources including fluvial, pluvial, tidal and groundwater with associated Flood Zones A and B identified. It is acknowledged that the areas identified should be treated with caution due to the indicative nature of the PFRA mapping.
Criteria 2	**Site 1**: These lands zoned 'Town or Village Centre' are indicated as vulnerable to fluvial flooding and primarily in Flood Zone A with smaller strips in Flood Zone B. Site 1 is characterised by existing development, primarily on brownfield sites, supporting a varying range of uses. Development within this site will therefore support the consolidation of the commercial centre.

	It will be infill in nature ensuring compact, localised and balanced sustainable growth prioritised on infill/brownfield sites with support for economic related development. It will also support the creation of a vibrant community and encourage the rejuvenation of vacant and underutilised lands for appropriate purposes. **Site 2**: These lands are zoned 'New Residential' (A2) and are indicated as vulnerable to fluvial flooding. A portion of the lands are in Flood Zone A. As the substantial portion of these zoned lands is not identified for potential flood risk and is located within Flood Zone C it is anticipated that flood risk mitigation measures could be designed to allow development of the wider site, as necessary. Development of the site will require a site-specific FRA which should consider the Sequential Approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009. **Site 3**: Refers to lands zoned for 'General Employment' (E1) and indicated as vulnerable to fluvial flooding. A portion of the lands are in Flood Zones A and B. As the substantial portion of these zoned lands is not identified for potential flood risk and is located within Flood Zone C it is anticipated that flood risk mitigation measures could be designed to allow development of the wider site, as necessary. Development of the site will require a site-specific FRA which should consider the sequential approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009. **Infill Lands**: Lands within the existing settlement and zoned 'Town or Village' (B1) and 'Existing Residential' (A1) are characterised by existing buildings and structures with a range of varying uses. A Justification Test was not carried out on these lands as they are already developed. Further development on the lands will be of an infill/brownfield nature. Within areas of existing development, proposals for extensions and minor development shall be assessed with reference to Section 5.28 of the Planning System and Flood Risk Management Guidelines, in accordance with Policies IU 26-IU 35 of the LCDP. Any highly vulnerable or less vulnerable land uses affected by Flood Zone A or B should employ the sequential approach when considering the site layout and an appropriately detailed site-specific FRA must be submitted at development management stage.
Criteria 3	A detailed site-specific FRA shall be submitted with any planning application to address flood risk, propose mitigation measures and assign appropriate development. A site-specific FRA should address the following: • A sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain. • Highly Vulnerable Development shall not be permitted in Flood Zone A or B. • Development in Flood Zone A should be either open space or water compatible. • FRA should address residual risk of culvert blockage (where applicable), increased flood extents under climate change scenarios and pluvial risk which should be aimed at setting finished floor levels. • Compensatory storage for development that results in a loss of floodplain within Flood Zone A must be provided on a level for level basis.
Conclusion	**Site 1** Justification Test satisfied. **Site 2** Justification Test satisfied. **Site 3**: Justification Test satisfied. It is recommended that any proposals for future development on lands vulnerable to flooding and in Flood Zones A and B will be subject to a site-specific FRA to ensure that development is appropriate and satisfies Criteria 3 of the Justification Test.

Termonfeckin

Hierarchy	Self Sustaining Town
Area for Further Assessment under the CFRAM Programme	Yes

Map



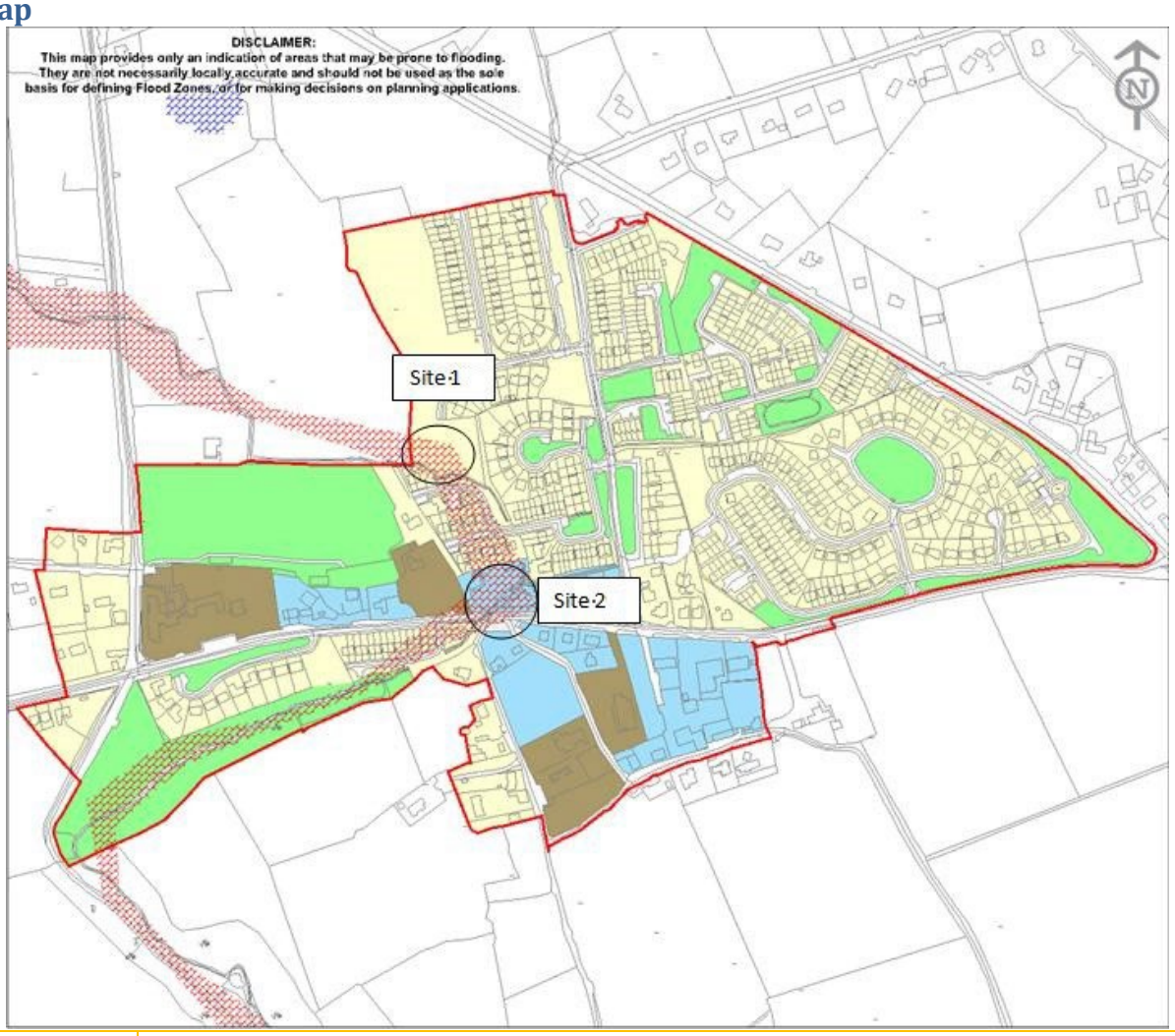
Criteria 1	Termonfeckin in the Settlement Strategy of the LCDP is identified as a 'Self-Sustaining Town'. The Core and Growth Strategies both focus on driving investment in services, employment growth and infrastructure while balancing housing delivery, including consolidation of the core areas and delivery of compact growth. In support of these strategies the corresponding Policy Objectives seek to facilitate balanced and proportionate population and economic growth to meet the needs of the residents of the settlements while creating vibrant rural communities through the promotion and targeting of sustainable development. The rejuvenation of vacant and underutilised lands for appropriate uses is also encouraged. Termonfeckin is a settlement characterised by a weak employment base. Termonfeckin, as one of eight identified 'Areas for Further Assessment', was subject to the CFRAM programme with associated Flood Zones A and B identified.
Criteria 2	**Site 1**: Rezone lands zoned 'Existing Residential' (A1) south of the Ballywater River which are in Flood Zones A and B, as the primary provision of residential development on these lands is not compatible. These lands are to be rezoned as 'Open Space' (H1). **Site 2**: These lands zoned 'Town or Village Centre' are characterised by existing development, primarily on brownfield sites, supporting a varying range of uses. Development within this site will therefore be infill in nature. Such infill development is essential to fully realise the implementation of the policy objectives which seek to consolidate and strengthen the commercial and residential town centre and encourage development which will contribute to its character and meet the needs of the community. It is also necessary to support the role of Termonfeckin as a local service and employment destination, where the town centre is the priority location for new commercial and mixed use development thus promoting compact, sustainable development and reducing the need to travel by car. **Infill Lands**: Lands within the existing settlement and zoned 'Town or Village Centre' (B1) and 'Existing Residential' (A1) are characterised by existing buildings and structures with a range of varying uses. A Justification Test was not carried out on these lands as they are already developed. Further development on the lands will be of an infill/brownfield nature.

	Within areas of existing development, proposals for extensions and minor development shall be assessed with reference to Section 5.28 of the Planning System and Flood Risk Management Guidelines, in accordance with Policies IU 26-IU 35 of the LCDP. Any highly vulnerable or less vulnerable land uses affected by Flood Zone A or B should employ the sequential approach when considering the site layout and an appropriately detailed site-specific FRA must be submitted at development management stage.
Criteria 3	A detailed site-specific FRA shall be submitted with any planning application to address flood risk, propose mitigation measures and assign appropriate development. A site-specific FRA should address the following: • A sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain. • Highly Vulnerable Development shall not be permitted in Flood Zone A or B. • Development in Flood Zone A should be either open space or water compatible. • FRA should address residual risk of culvert blockage (where applicable), increased flood extents under climate change scenarios and pluvial risk which should be aimed at setting finished floor levels. • Compensatory storage for development that results in a loss of floodplain within Flood Zone A must be provided on a level for level basis.
Conclusion	**Site 1:** Justification Test failed. Rezone lands to Open Space. **Site 2:** Justification Test satisfied. It is recommended that any proposals for future development on lands vulnerable to flooding and in Flood Zones A and B will be subject to a site-specific FRA to ensure that development is appropriate and satisfies Criteria 3 of the Justification Test.

Tullyallen

Hierarchy	Self Sustaining Town
Area for Further Assessment under the CFRAM Programme	No

Map



Criteria 1	Tullyallen in the Settlement Strategy of the LCDP is identified as a 'Self-Sustaining Town'. The Core and Growth Strategies both focus on driving investment in services, employment growth and infrastructure while balancing housing delivery, including consolidation of the core areas and delivery of compact growth. In support of these strategies, the corresponding Policy Objectives seek to facilitate balanced and proportionate population and economic growth to meet the needs of the residents of the settlements while creating vibrant rural communities through the promotion and targeting of sustainable development. The rejuvenation of vacant and underutilised lands for appropriate uses is also encouraged. Tullyallen is a settlement characterised by a weak employment base. The Preliminary Flood Risk Assessment (PFRA) mapping undertaken by the OPW (2011) identifies lands within the Tullyallen development boundary at potential flood risk. The PFRA considered flooding from a number of sources including fluvial, pluvial, tidal and groundwater with associated Flood Zones A and B identified. It is acknowledged that the areas identified should be treated with caution due to the indicative nature of the PFRA mapping.
Criteria 2	**Site 1**: These lands are zoned 'Existing Residential' (A1) with portions vulnerable to fluvial flooding with lands in Flood Zone A. To date, a portion of the lands remain undeveloped, vacant and underutilised.

	As the substantial portion of these zoned lands is not identified for potential flood risk and is located within Flood Zone C it is anticipated that flood risk mitigation measures could be designed to allow development of the wider site, as necessary. Development of the site will require a site-specific FRA which should consider the sequential approach within the site, allocating vulnerable and less vulnerable development to Flood Zone C and restricting the type of development to that which is 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines 2009. **Site 2:** These lands are zoned 'Town or Village Centre' (B1), with portions indicated as being vulnerable to fluvial flooding with lands in Flood Zone A. They are characterised by existing development, primarily on brownfield sites, supporting a varying range of uses. Development within this site will therefore be infill in nature. Such infill development is essential to fully realise the implementation of the policy objectives which seek to consolidate and strengthen the commercial and residential town centre and encourage development which will contribute to its character and meet the needs of the community. It is also necessary to support the role of Tullyallen as a local service and employment destination, where the town centre is the priority location for new commercial and mixed use development thus promoting compact, sustainable development and reducing the need to travel by car. **Infill Lands**: Lands within the existing settlement and zoned 'Town or Village Centre' (B1), 'Existing Residential' (R1) or 'Community Facilities' (G1) are characterised by existing buildings and structures with a range of varying uses. A Justification Test was not carried out on these lands as they are already developed. Further development on the lands will be of an infill/brownfield nature. Within areas of existing development, proposals for extensions and minor development shall be assessed with reference to Section 5.28 of the Planning System and Flood Risk Management Guidelines, in accordance with Policies IU 26-IU 35 of the LCDP. Any highly vulnerable or less vulnerable land uses affected by Flood Zone A or B should employ the sequential approach when considering the site layout and an appropriately detailed site-specific FRA must be submitted at development management stage.
Criteria 3	A detailed site-specific FRA shall be submitted with any planning application to address flood risk, propose mitigation measures and assign appropriate development. A site-specific FRA should address the following: • A sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain. • Highly Vulnerable Development shall not be permitted in Flood Zone A or B. • Development in Flood Zone A should be either open space or water compatible. • FRA should address residual risk of culvert blockage (where applicable), increased flood extents under climate change scenarios and pluvial risk which should be aimed at setting finished floor levels. • Compensatory storage for development that results in a loss of floodplain within Flood Zone A must be provided on a level for level basis.
Conclusion	**Site 1** Justification Test satisfied. **Site 2** Justification Test satisfied. It is recommended that any proposals for future development on lands vulnerable to flooding and in Flood Zones A and B will be subject to a site-specific FRA to ensure that development is appropriate and satisfies Criteria 3 of the Justification Test.

APPENDIX 2

STRATEGIC FLOOD RISK ASSESSMENT (SFRA)

NOTE: This Strategic Flood Risk Assessment was carried out as part of the Dundalk Local Area Plan 2025-2031 and was incorporated into the SFRA for the CDP as part of Variation 3 to the County Development Plan 2021-2027.

STRATEGIC FLOOD RISK ASSESSMENT

FOR THE

DUNDALK LOCAL AREA PLAN
2025-2031

for: Louth County Council

Comhairle Contae Lú
Louth County Council

by: CAAS Ltd.

APRIL 2025

Louth County Council, County Hall, Millennium Centre, Dundalk, County Louth.
CAAS Ltd., 1st Floor, 24-26 Ormond Quay Upper, Dublin.

Table of Contents

Section 1 Introduction and Policy Background

1.1 Introduction

Louth County Council has prepared a Local Area Plan (LAP) for Dundalk under the Planning and Development Act 2000 (as amended). The Plan sets out an overall strategy for the proper planning and sustainable development of the town over the years 2025-2031.

This Strategic Flood Risk Assessment (SFRA) document has been prepared alongside the LAP taking into account *The Planning System and Flood Risk Management - Guidelines for Planning Authorities* (Department of the Environment, Heritage and Local Government and Office of Public Works, 2009) and Department of the Environment, Community and Local Government Circular PL 2/2014.

1.2 The Local Area Plan

LAPs are required to be consistent with the policy objectives of the County Development Plan and its Core Strategy, as well as the National Planning Framework and Regional Spatial Economic Strategies.

The LAP should be read in conjunction with the Louth County Development Plan 2021-2027 (as varied), which sets out the overarching development strategy for the County. Where conflicting policy objectives arise between the County Development Plan and the LAP, the policy objectives of the relevant County Development Plan shall take precedence.

The general development management standards, zoning matrix/descriptions and policies and objectives in the County Development Plan (including provisions relating to flood risk management and drainage) can be applied to the Plan area, while additional policy objectives that are specific to Dundalk are included in the LAP.

In addition, land use zoning contained within the Plan has been informed by the SFRA process and associated delineation of flood risk zones. The detailed Plan preparation process undertaken by the Planning Department combined with specialist input from the SFRA process facilitated zoning that helps to avoid inappropriate development being permitted in areas of high flood risk.

1.3 Flood Risk and its Relevance as an Issue to the Plan

Flooding is an environmental phenomenon and can pose a risk to human health as well as causing economic and social effects. Some of the effects of flooding are identified on Table 1.

Certain lands within the Plan area have the potential to be vulnerable to flooding and this vulnerability could be exacerbated by changes in both the occurrence of severe rainfall events and associated flooding. Local conditions such as low-lying lands and slow surface water drainage can increase the risk of flooding.

Table 1 Potential effects that may occur as a result of flooding

Tangible Effects	Intangible Human and Other Effects
Damage to buildings (houses)	Loss of life
Damage to contents of buildings	Physical injury
Damage to new infrastructure e.g. roads	Increased stress
Loss of income	Physical and psychological trauma
Disruption of flow of employees to work causing knock on effects	Increase in flood related suicide
Enhanced rate of property deterioration and decay	Increase in ill health
Long term rot and damp	Homelessness
	Loss of uninsured possessions

1.4 Flood Risk Management Policy

1.4.1 EU Floods Directive

The European Directive 2007/60/EC on the assessment and management of flood risk aims to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. The Directive applies to inland waters as well as all coastal waters across the whole territory of the EU. The Directive requires Member States to:

- Carry out a preliminary assessment by 2011 in order to identify the river basins and associated coastal areas where potential significant flood risk exists (preliminary mapping was prepared and a list of Areas for Further Assessment finalised in 2012).
- Prepare flood extent maps for the identified areas (finalised in 2016 for inclusion in Flood Risk Management Plans – see below).
- Prepare flood risk management plans focused on prevention, protection and preparedness. These plans are to include measures to reduce the probability of flooding and its potential consequences. These Plans were adopted in 2018.

Implementation of the EU Floods Directive is required to be coordinated with the requirements of the EU Water Framework Directive and the current National River Basin Management Plan.

1.4.2 National Flood Policy

Historically, flood risk management focused on land drainage for the benefit of agricultural improvement. With increasing urbanisation, the Arterial Drainage Act, 1945, was amended in 1995 to permit the Office of Public Works (OPW) to implement localised flood relief schemes to provide flood protection for cities, towns and villages.

In line with changing national and international paradigms on how to manage flood risk most effectively and efficiently, a review of national flood policy was undertaken in 2003-2004. The review was undertaken by an Inter-Departmental Review Group, led by the Minister of State at the Department of Finance with special responsibility for the OPW. The Review Group prepared a report that was put to Government, and subsequently approved and published in September 2004 (Report of the Flood Policy Review Group, OPW, 2004).

The scope of the review included a review of the roles and responsibilities of the different bodies with responsibilities for managing flood risk, and to set a new policy for flood risk management in Ireland into the future. The adopted policy was accompanied by many specific recommendations, including:

- Focus on managing flood risk, rather than relying only flood on protection measures aimed at reducing flooding;
- Taking a catchment-based approach to assess and manage risks within the whole-catchment context; and
- Being proactive in assessing and managing flood risks, including the preparation of flood maps and flood risk management plans.

1.4.3 National CFRAM Programme

The national Catchment Flood Risk Assessment and Management (CFRAM) programme commenced in Ireland in 2011. The CFRAM Programme is intended to deliver on core components of the National Flood Policy, adopted in 2004, and on the requirements of the EU Floods Directive. The Programme has been implemented through CFRAM studies that have been undertaken for each of the river basin districts in Ireland.

The CFRAM Programme comprises three phases as follows:

- The Preliminary Flood Risk Assessment[1] (PFRA) mapping exercise, which was completed in 2012;
- The CFRAM Studies and parallel activities, with Flood Risk Management Plans finalised in 2018; and
- Implementation and Review.

The Programme provides for three main consultative stages as follows:

- Consultation for the PFRA mapping that was adopted in 2012;
- Consultation for Flood Extent mapping, that was finalised in 2016 for inclusion in Flood Risk Management Plans; and
- Consultation for Flood Risk Management Plans, that were adopted in 2018.

The OPW is the lead agency for flood risk management in Ireland. The coordination and implementation of Government policy on the management of flood risk in Ireland is part of its responsibility. The European Communities (Assessment and Management of Flood Risks) Regulations 2010 (S.I. No. 122) identifies the Commissioners of Public Works as the 'competent authority' with overall responsibility for implementation of the Floods Directive 2007/60/EC. The OPW is the principal agency involved in the preparation of CFRAM Studies.

1.4.4 Flood Risk Management Guidelines

1.4.4.1 Introduction

In 2009, the OPW and the then Department of the Environment and Local Government (DEHLG) published Guidelines on flood risk management for planning authorities entitled *The Planning System and Flood Risk Management - Guidelines for Planning Authorities*. The Guidelines introduce mechanisms for the incorporation of flood risk identification, assessment and management into the planning process. Implementation of the Guidelines is intended to be achieved through actions at the national, regional, local authority and site-specific levels. Planning authorities and An Bord Pleanála are required to have regard to the Guidelines in carrying out their functions under the Planning Acts.

The core objectives of the Guidelines are to:

- Avoid inappropriate development in areas at risk of flooding;
- Avoid new developments increasing flood risk elsewhere, including that which may arise from surface water run-off;
- 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; and
- 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.

[1] The PFRAs identified areas at risk of significant flooding and includes maps showing areas deemed to be at risk. The areas deemed to be most significant risk, where the flood risk that is of particular concern nationally, are identified as Areas for Further Assessment (AFAs). Dundalk was identified as an AFA. The OPW has undertaken a detailed assessment on the extent and degree of fluvial flood risk for various areas in County Louth, including these AFAs, producing Flood Extent Mapping.

1.4.4.2 Principles of Flood Risk Management

The key principles of flood risk management set out in the flood Guidelines are to:

- Avoid development that will be at risk of flooding or that will increase the flooding risk elsewhere, where possible;
- Substitute less vulnerable uses, where avoidance is not possible; and
- Mitigate and manage the risk, where avoidance and substitution are not possible.

The Guidelines follow the principle that development should not be permitted in flood risk areas, particularly floodplains, except where there are no alternative and appropriate sites available in lower risk areas that are consistent with the objectives of proper planning and sustainable development.

Development in areas that have the highest flood risk should be avoided and/or only considered in exceptional circumstances (through a prescribed *Justification Test*) if adequate land or sites are not available in areas that have lower flood risk. Most types of development would be considered inappropriate in areas that have the highest flood risk. Only water-compatible development such as docks and marinas, dockside activities that require a waterside location, amenity open space, outdoor sports and recreation and essential transport infrastructure that cannot be located elsewhere would be considered appropriate in these areas.

1.4.4.3 Stages of SFRA

The Flood Risk Management Guidelines recommend a staged approach to flood risk assessment that covers both the likelihood of flooding and the potential consequences. The stages of appraisal and assessment are:

> **Stage 1 Flood risk identification** – to identify whether there may be any flooding or surface water management issues related to either the area of Regional Spatial and Economic Strategies, Development Plans and LAP's or a proposed development site that may warrant further investigation at the appropriate lower-level plan or planning application levels.
>
> **Stage 2 Initial flood risk assessment** – to confirm sources of flooding that may affect a Plan area or proposed development site, to appraise the adequacy of existing information and to scope the extent of the risk of flooding which may involve preparing flood zone maps. Where hydraulic models exist the potential impact of a development on flooding elsewhere and of the scope of possible mitigation measures can be assessed. In addition, the requirements of the detailed assessment are scoped.
>
> **Stage 3 Detailed flood risk assessment** – to assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk to a proposed or existing development or land to be zoned, of its potential impact on flood risk elsewhere and of the effectiveness of any proposed mitigation measures.

1.4.4.4 Flood Zones

Flood risk is an expression of the combination of the flood probability or likelihood and the magnitude of the potential consequences of the flood event. It is normally expressed in terms of the following relationship:

Flood risk = Likelihood of flooding x Consequences of flooding

Likelihood of flooding is normally defined as the percentage probability of a flood of a given magnitude or severity occurring or being exceeded in any given year. For example, a 1% Annual Exceedance Probability (AEP) indicates the severity of a flood that is expected to be exceeded on average once in 100 years, i.e. it has a 1 in 100 (1%) chance of occurring in any one year.

Consequences of flooding depend on the hazards associated with the flooding (e.g. depth of water, speed of flow, rate of onset, duration, wave-action effects, water quality) and the vulnerability of people, property and the environment potentially affected by a flood (e.g. the age profile of the population, the type of development and the presence and reliability of mitigation measures).

Flood zones are geographical areas within which the likelihood of flooding is in a particular range and they are a key tool in flood risk management within the planning process as well as in flood warning and emergency planning.

There are three types of flood zones defined for the purposes of the Flood Guidelines:

- **Flood Zone A** – where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding);
- **Flood Zone B** – where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding); and
- **Flood Zone C** – where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all other areas that are not in zones A or B.

A summary of the requirements of the Flood Guidelines for land uses across each of the above flood zones is provided at Appendix I.

1.5 Emerging Information and Disclaimer

It is important to note that compliance with the requirements of the Flood Risk Management Guidelines is currently based on emerging and best available data at the time of preparing the assessment, including Flood Risk Management Plans, which will be updated on a cyclical basis.

Following adoption of the Plan, information in relation to flood risk may be altered in light of future data and analysis, by, for example, the OPW, or future flood events. As a result, all landowners and developers are advised that Louth County Council and their agents can accept no responsibility for losses or damages arising due to assessments of the vulnerability to flooding of lands, uses and developments. Owners, users and developers are advised to take all reasonable measures to assess the vulnerability to flooding of lands and buildings (including basements) in which they have an interest prior to making planning or development decisions.

Any future SFRAs for the Plan area or for the County will integrate other new and emerging data.

Section 2 Stage 1 SFRA - Flood Risk Identification

2.1 Introduction

Stage 1 SFRA (flood risk identification) has been undertaken in order to identify whether there may be any flooding or surface water management issues within or adjacent to zoned lands and consequently whether Stage 2 SFRA (flood risk assessment) should be proceeded to. It is reproduced in part this document.

Dundalk is located within the Neagh Bann River Basin for which the "Flood Risk Management Plan for the Neagh Bann River Basin (UOM06)" has been prepared. Stage 1 SFRA is based on existing information on flood risk indicators based on historical evidence and computational models. A selection of key indicators is mapped for Dundalk in Appendix II.

2.2 Drainage, Defences and Early Warning Systems

With regard to areas benefitting from drainage and defences (flood relief scheme works), there are various measures that have been implemented in County Louth that will contribute towards flood risk management. These include the culverting of various streams and rivers in many urban areas and embankments.

There are no known defended areas with a National CFRAM confirmed 10% Annual Exceedance Probability (AEP) Standard of Protection that have been identified by the Council or the SFRA process. There are informal structures likely to provide levels of defence in places; however, these have not been designed by modern engineering methods and their effectiveness has not been confirmed. Following the completion of the Dundalk Flood Relief Scheme the Council will consider the inclusion of a register of key flood risk infrastructure in future land use plans for the town.

There are a number of Drainage Districts Channels occurring across the Plan area. 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. 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.

There are also Drainage Districts Embankments (walls of soil or sods that were erected to prevent flood water or high tides from entering land; drains and sluices or pumps were also provided to take away rainwater that fell behind the embankments) occurring along the Fane River in the south of the Plan area.

Benefited land, land that was drained as part of the Drainage District measures, are also identified within the Plan area.

The 2018 Flood Risk Management Plan (FRMP) for the Neagh Bann River Basin (UOM06) identifies various general measures applicable to the catchment under "Measures Applicable for all Areas"[2].

The FRMP identifies the following existing measures for the Neagh Bann catchment in particular: Maintenance of Arterial Drainage Schemes[3]; and Maintenance of Drainage Districts[4].

For Dundalk/ Blackrock South specifically, the FRMP identifies that the progression of a Flood Relief Scheme for Dundalk and Blackrock South is underway: "The proposed Dundalk and Blackrock South Flood Relief Scheme may include a series of hard defences, including flood embankments and walls, rock armour coastal protection, demountable barriers, road raising, a sluice gate and tanking of two properties, and channel conveyance improvements. The defences would be required along with improvement of channel conveyance on the Blackrock River and Dundalk Blackwater River, along with Storage on the Castletown River. These proposed measures are expected to provide protection to the 0.5% coastal events and the 1% AEP fluvial flood event." Updates on the current status of the Scheme are available from the project website https://www.floodinfo.ie/frs/en/dundalk/home/.

The provision of flood protection measures can significantly reduce flood risk. However, the Ministerial Guidelines require that the presence of flood protection structures should be ignored in determining flood zones. This is because of risks relating to failure and severe flood events that exceed design capacity (the risk of severe events is exacerbated with climate change). Notwithstanding this, new development can proceed in areas that are at elevated levels of flood risk subject to the Justification Test provided for by the Guidelines being passed, which takes into account proposals to manage flood risk, such as the development of defences. Although insurance can be challenging to attain in these instances.

As provided for by the Louth County Development Plan 2021-2027 (as varied), it is a Council Policy Objective:

- To ensure that no development including clearing or storage of materials takes place within a minimum distance of 10m measured from each bank of any river, stream or watercourse (IU 25); and
- To consult with the Office of Public Works (OPW) in relation to proposed developments in the vicinity of drainage channels and rivers for which the OPW are responsible (IU 34).

Met Éireann currently issues flood warnings for County Louth. Met Éireann, in collaboration with the OPW, is currently engaged in the establishment of a National Flood Forecasting and Warnings Service to forecast for fluvial and coastal flood events.

2.3 Other Flood Studies

Other Flood Studies considered in the preparation of this assessment include:

- Previous SFRAs in County Louth;
- Flood Risk Management Plan (Neagh Bann Basin), 2018;
- Regional Flood Risk Assessment for the Northern and Western Regional Spatial and Economic Strategy, 2020; and
- Emerging findings of the Dundalk Flood Relief Scheme Project, 2024.

[2] Under the headings of:
- Prevention: Sustainable Planning and Development Management
- Prevention: Sustainable Urban Drainage Systems
- Prevention: Voluntary Home Relocation
- Prevention: Adaptation Planning
- Prevention: Land Use Management and Natural Flood Risk Management
- Protection: Maintenance of Channels Not Part of a Scheme
- Preparedness: Promotion of Individual and Community Resilience
- Preparedness: Flood Forecasting and Warning
- Preparedness: Emergency Response Planning
- Preparedness: Individual Property Protection
- Preparedness: Flood-Related Data Collection

[3] The OPW has a statutory duty under the Arterial Drainage Act, 1945, and the Amendment of the Act, 1995, to maintain the Arterial Drainage and Flood Relief Schemes constructed by it under those Acts.

[4] The statutory duty of maintenance for 4,600 km of river channel benefiting from Drainage District Schemes rests with the relevant Local Authorities.

2.4 Flood Risk Indicators

Indicators of flood risk that are based on historical flooding events are identified and described on Table 2. Indicators of flood risk that are based on computational models – predictive flood risk indicators – are identified and described on Table 3. A selection of the historical and predictive flood risk indicators that were considered by the SFRA are mapped at settlement level for Dundalk in Appendix II.

Table 2 Historical Flood Risk Indicators

Information Source	Description	Strategic Limitations
Recorded Flood Events from the OPW	A flood event is the occurrence of recorded flooding at a given location on a given date. The flood event is derived from different types of information (reports, photographs etc.).	This dataset only provides a spot location
Recurring Flood Events	A flood event that has occurred more than once at a certain area is named a recurring flood event.	This dataset only provides a spot location
OPW Flood Extent	A flood extent is an inundated area as recorded at a certain moment in time. This layer of information includes floods recorded in 1999/2000 and 1954.	Coverage limited
Alluvium Soils	Mineral alluvial soil mapping is indicative of recurrent or significant fluvial flooding at some point in the past and was generated by Teagasc with co-operation of the Forest Service, EPA and GSI. This project was completed May 2006.	Drainage may have changed significantly since these soils were deposited.
Benefitting lands (OPW)	Benefitting lands mapping is a dataset identifying land that might benefit from the implementation of Arterial (Major) Drainage Schemes (under the Arterial Drainage Act 1945) and indicating areas of land estimated or reported to be subject to flooding or poor drainage.	Identifies broad areas - low resolution for flood risk management
Drainage Districts (OPW)	This drainage scheme mapping dataset was prepared on behalf of the Drainage Districts (Local Authorities with statutory responsibility for maintenance under the Arterial Drainage Act, 1925). These maps identify land that might benefit from the implementation of Arterial (Major) Drainage Schemes and indicate areas of land subject to flooding or poor drainage.	Identifies large broad areas - very low resolution for flood risk management
Land Commission (OPW)	This dataset indicates areas of land defended to some degree against flooding that were formerly the responsibility of the Land Commission.	Identifies broad areas - low resolution for flood risk management

Table 3 Predictive Flood Risk Indicators

Information Source	Description	Strategic Limitations
CFRAM Study, Flood Extent Mapping, 2016	Following the undertaking of the PFRA, the OPW, through its engineering consultants and working with local authorities and other stakeholders, conducted extensive engineering assessments to better understand and detail the actual risk from flooding for areas that were at highest levels of risk. This was the subject of public consultation. The outcome of that work includes Predicted Flood Extent maps that were finalised in 2016. For fluvial flood levels, calibration and verification of the models make use of the best available data including hydrometric records, photographs, videos, press articles and anecdotal information.	Spatial spread is limited, including to the areas that are considered to be at most risk of flooding.
National Indicative Fluvial Mapping (NIFM) 2021	The PFRA indicative flood maps have now been superseded by the NIFM published in 2021. The OPW NIFM project has produced second generation indicative fluvial flood spatial data that are of a higher quality and accuracy to those produced for the first cycle PFRA. This project has covered 27,000 km of river reaches, separated into 37 drainage areas, consisting of 509 sub-catchments. Data has been produced for catchments greater than $5km^2$ in areas for which flood maps were not produced under the National CFRAM Programme and should be read in this context.	Does not cover smaller sized catchments less than $5km^2$.

Information Source	Description	Strategic Limitations
National Coastal Flood Hazard Mapping 2021	The OPW's National Coastal Flood Hazard Mapping, completed in 2021, provides updated national scale coastal flood extent and depth maps. Maps were produced for the 50% (equivalent to a one in two-year event), 20%, 10%, 5%, 2%, 1%, 0.5% and 0.1% (equivalent to a one in 1000-year event) Annual Exceedance Probabilities for the present-day scenario and for future climate change scenarios, which represent increases in sea level.	Although widely accepted methods have been used to prepare the maps, there is a range of inherent uncertainties within the process of preparing the flood extent and depth maps. These include: • Uncertainties in the estimated extreme water levels: This can arise due to uncertainties in topographic and other survey data, meteorological data, assumptions and / or approximations in the hydraulic / hydrodynamic models in representing physical reality, assumptions in the hydraulic / hydrodynamic modelling, datum conversions, etc. • Uncertainties in the flood extents and depths: This can arise due to uncertainties in the estimated extreme water levels, topographic and other survey data, assumptions and / or approximations in the way that flooding spreads over a floodplain, etc. Due to the various sources of potential inaccuracies in the flood extent and depth maps, a quantitative assessment of their accuracy has not been carried out. A qualitative assessment of the maps was carried out as part of the quality control process. The flood extent and depth maps are therefore suitable for the assessment of flood risk at a strategic scale only, and should not be used to assess the flood hazard and risk associated with individual properties or point locations, or to replace a detailed flood risk assessment. The potential for inaccuracy should be recognised if these flood maps are to be used for any purpose.

Information Source	Description	Strategic Limitations
Emerging findings of the Dundalk Flood Relief Scheme Project, 2024	The 2016 Neagh Bann CFRAM Study model, developed during the national CFRAM programme, was reviewed with relevance to the Dundalk Flood Relief Scheme. The 2016 model has been expanded and refined to provide new flood extent and flood depth mapping for Dundalk and Blackrock. The following considerations were employed to refine and improve the CFRAM model: • Updated hydrological assessment of the scheme area; • New and more accurate topographical and threshold surveys; • Additional CCTV surveys of significant culverts and sewers; • Expansion of the model reflecting new infrastructure, changes to existing infrastructure and changes to watercourses since CFRAM; • A more refined model mesh size to improve accuracy of the model outputs; • A more conservative joint probability assessment of fluvial and coastal flooding; and • Sensitivity analysis to support the understanding of any uncertainties or assumptions associated with the model input parameters.	Does not cover Fane sub-catchment in the south of the Plan area.
Predictive groundwater flood mapping	The predictive groundwater flood map presents the probabilistic flood extents for locations of recurrent karst groundwater flooding. It consists of a series of stacked polygons at each site representing the flood extent for specific AEP's mapping floods that are expected to occur every 10, 100 and 1000 years (AEP of 0.1, 0.01, and 0.001 respectively). The map is focussed primarily (but not entirely) on flooding at seasonally inundated wetlands known as turloughs. Sites were chosen for inclusion in the predictive map based on existing turlough databases as well as manual interpretation of Synthetic Aperture Radar (SAR) imagery. The mapping process tied together the observed and SAR-derived hydrograph data, hydrological modelling, stochastic weather generation and extreme value analysis to generate predictive groundwater flood maps for over 400 qualifying sites.	Not all turloughs are included in the predictive map as some sites could not be successfully monitored with SAR and/or modelled.

2.5 Conclusion

The information detailed above indicates elevated levels of flood risk in various locations across the town; therefore, a Stage 2 SFRA was proceeded to.

Section 3 Stage 2 SFRA - Flood Risk Assessment

3.1 Introduction

Stage 2 SFRA (flood risk assessment) has been undertaken in order to:

- Confirm the sources of flooding that may affect zoned and adjacent areas;
- Appraise the adequacy of existing information as identified by the Stage 1 SFRA; and
- Scope the extent of the risk of flooding through the preparation of flood zone maps.

3.2 Findings and Adequacy of Existing Information and Delineation of Flood Zones

Desk and in-field studies were undertaken taking into account the following factors:

- Predictive indicators, including the emerging findings of the Dundalk Flood Relief Scheme Project;
- Historical indicators of flood risk;
- Documented Council knowledge of lands;
- The potential source and direction of flood paths from rivers and streams;
- Vegetation indicative of flood risk; and
- The locations of topographic/built features that coincide with the flood indicator related boundaries/topographical survey.

Within the annual exceedance probabilities specified by the Flood Guidelines for Flood Zones A and B, there are elevated levels of flood risk at certain areas in Dundalk, as shown in Appendix II.

3.3 Flood Risk Zone Mapping

Flood Risk Zone maps have been produced taking into account the findings of the Stage 1 and Stage 2 SFRA desk and in field studies as identified above[5].

The Flood Risk Zone map for Dundalk is provided in Appendix II and identifies Flood Zone A (darker blue) and Flood Zone B[6] (lighter blue). All other areas fall within Flood Zone C. As per the Guidelines, the flood zones are as follow:

- **Flood Zone A** – where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding);
- **Flood Zone B** – where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding); and
- **Flood Zone C** – where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all other areas that are not in zones A or B.

[5] Including taking into account predictive and historical indicators of flood risk, documented Council knowledge of lands, Council Engineer review and input into indicators and flood zones (local knowledge), the potential source and direction of flood paths from rivers and streams, vegetation indicative of flood risk and the locations of topographic/built features that coincide with the flood indicator related boundaries/topographical survey.

[6] As identified by the Guidelines, in rivers with a well-defined floodplain or where the coastal plain is well defined at its rear, the limits of Zones A and B will virtually coincide. Zone B will only be significantly different in spatial extent from Zone A where there is extensive land with a gentle gradient away from the river or the sea.

3.4 Sensitivity to Climate Change

'The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009' recommends that a precautionary approach to climate change is adopted due to the level of uncertainty involved in the potential effects. In this regard, the Guidelines recommend:

- Recognising that significant changes in the flood extent may result from an increase in rainfall or tide events and accordingly adopting a cautious approach to zoning land in these potential transitional areas;
- Ensuring that the levels of structures designed to protect against flooding such as flood defences[7], land raising or raised floor levels are sufficient to cope with the effects of climate change over the lifetime of the development they are designed to protect (normally 85-100 years); and
- Ensuring that structures to protect against flooding and the development protected are capable of adaptation to the effects of climate change when there is more certainty about the effects and still time for such adaptation to be effective.

The CFRAM Programme include maps for two potential future scenarios taking account of different degrees of climate impact, the Mid-Range Future Scenario (more likely to occur over the coming decades) and the High End Future Scenario (less likely to occur over the coming decades). Furthermore, the National Coastal Flood Hazard Mapping 2021 provides updated national scale coastal flood extent and depth maps for the present-day scenario and for various future scenario maps, representing projected future scenarios for the end of century (c. 2100).

A selection of Future Scenario Mapping is provided under Appendix II of this SFRA report, including mapping that shows the land uses that have been provided for in areas identified as being at risk under future climate scenarios. In compliance with the Guidelines, the Flood Zones identified by the SFRA are defined on the basis of current flood risk.

The Guidelines state that:

> "A precautionary approach should be applied, where necessary, to reflect uncertainties in flooding datasets and risk assessment techniques and the ability to predict the future climate and performance of existing flood defences. Development should be designed with careful consideration to possible future changes in flood risk, including the effects of climate change and / or coastal erosion so that future occupants are not subject to unacceptable risks."

As per **Policy Objective INF 20,** with respect to climate change, Flood Risk Assessments shall apply the precautionary approach recommended in the Guidelines and shall consider climate change impacts and adaptation measures, including details of structural and non-structural flood risk management measures, such as those relating to floor levels, internal layout, flood-resistant construction, flood-resilient construction, emergency response planning and access and egress during flood events. The Local Area Plan SFRA datasets and the most up to date CFRAM Programme climate scenario mapping, together with the allowances to be provided for future flood risk management provided in the OPW's (2019) Flood Risk Management Climate Change Sectoral Adaptation Plan and the guidance on potential future scenarios contained therein, should be consulted by prospective applicants for developments in this regard and will be made available to lower-tier Development Management processes in the Council.

[7] Defended areas are highly sensitive to climate change as the likelihood of defence failure and resulting flooding increases.

3.5 Sustainable Drainage Systems and Surface Water Guidance and Strategy

As provided for by measures integrated into both the existing, already in force, Louth County Development Plan and the Local Area Plan (including the measures reproduced at Section 4 of this report), new developments will be required to incorporate the requirement for Sustainable Urban Drainage Systems (SuDS) where appropriate. In combination, these provisions contribute towards a sustainable drainage strategy for the Plan area.

It is likely that some or all of the following SuDS techniques will be applicable to key development sites[8] within Dundalk, including to manage surface water run-off:

- Rainwater harvesting
- Green roofs
- Infiltration systems
- Proprietary treatment systems
- Filter strips
- Filter drains
- Swales
- Bioretention systems
- Trees
- Pervious pavements
- Attenuation storage tanks
- Detention basins
- Ponds and wetlands

Each land use zoning objective, including those for opportunity sites, allows for a range of possible uses and the Local Area Plan, and associated County Development Plan, allow for a range of scales, heights, densities configurations/layouts and designs. The application of different SuDS techniques will be dependent on a combination of the site's characteristics and the development (when known) being considered.

Because of the infinite range of land use types and associated developments and designs that could occur on sites within the Plan area under this type of Plan[9], the guidance from this SFRA is to consider the full range of SUDs available, taking into account the recommendations and information provided above and below. On key development/opportunity sites, in particular, integrated and area-based provision of SuDS and green infrastructure may be appropriate in order to avoid reliance on individual site by site solutions.

Some sites, such as those for which guidance is provided for below, will pose particular challenges for SuDS. The best practice manuals cited at the end of this sub-section should be considered in determining solutions at these and other development sites.

At sites with high groundwater levels:

- Infiltration techniques may be particularly challenging and shallow infiltration basins or permeable pavements, may be most appropriate.
- Storage and conveyance systems need to be kept above maximum groundwater levels and membranes of appropriate robustness should be used to line any tanks
- Locating storage tanks or lined sub-base systems below the maximum likely groundwater level can cause result in flotation and structural risks

[8] Including Key Development Areas (Mount Avenue Area; Raynoldstown Village; St. Nicholas Quarter; The Long Walk Quarter; Park Street/Francis Street and St Patrick's Church; and Dundalk Port), Character Areas (St. Nicholas Quarter; Park Street/Francis Street and St. Patrick's Church; Seatown; The Station Quarter; and The Marshes) and Key Locations for Economic Investment and Employment Generating Uses (Town Centre; Dundalk North Business Park, Armagh Road; Lands at the Ballymacscanlon Roundabout; Lands opposite Dundalk Racecourse; and Coe's Road Industrial Estate; Brewery Business Park and adjoining Employment Lands; and Mullagharlin Area)

[9] Refer to Louth County Development Plan Section 13.21 Land Use Zoning Objectives for the wide range of land uses possible at sites zoned with single land use zoning objectives.

At sites that are steeply sloping:

- Effective utilisation of SuDS storage capacity should be considered, which can benefit from aligning with contours of roads and other structures, where these sites are terraced. Terraced car-parking areas can allow for storage of water through pervious pavements. Basins on terraces can provide open space. The runoff catchment on these sites can also be divided into smaller sub catchments.
- Velocities in swales and basins due to the steep slope can be managed by using check dams in swales or in storage layers, such as below permeable pavements.
- The possibility of infiltrating water resurfacing downslope or to increase pressure on downslope structures, such as walls, causing them to fail should be considered.

At sites that are very flat:

- On very flat sites, it is often not possible to construct piped drainage systems with sufficient falls to achieve minimum self-cleansing velocities. The solution can involve the use of shallow SuDS components such as swales, pervious pavements or high-capacity linear drainage channels, often dividing the site into small sub-catchments and providing local combined storage and conveyance components.
- A slight fall on any subgrade exposed to water is preferred in order to avoid ponding of water and reduction in strength in the soil due to waterlogging. If this is not possible then reduction in strength should be taken into account in the structural design of tanks or pervious pavements.
- Pumping should be a last resort and only allowable in situations where guaranteed maintenance of the pumps can be ensured.

At sites that include areas of floodplain:

- Notwithstanding that all storage volume should normally be provided within the development footprint, outside of the floodplain, SuDs on floodplains can be effective in managing routine rainfall/treatment for frequent events.
- SuDs should be selected and designed taking account of the likely high groundwater table and vulnerability to erosion during periods of high flows/water levels and SuDS should not reduce floodplain storage or conveyance.
- Conveyance routes should limit grading and the creation of surface features that could either reduce floodplain capacity or be washed out in a flood.
- Surface discharge from SuDS should be dispersed with point discharges minimised or eliminated.
- All SuDS within or crossing a floodplain should take full consideration of the likely influence of river water levels on the design performance. Combined probability assessments may be required.
- Siltation and subsequent clearance after a flood event has subsided should also be taken into account in the design.

SuDS are effective technologies, which aim to reduce flood risk, improve water quality and enhance biodiversity and amenity.

The systems should aim to mimic the natural drainage of the application site to minimise the effect of a development on flooding and pollution of existing waterways. SuDS include devices such as swales, permeable pavements, filter drains, storage ponds, constructed wetlands, soakways and green roofs. The integration of nature-based solutions, such as amenity areas, ecological corridors and attenuation ponds, into public and private development initiatives, is applicable within the provisions of the Plan and should be encouraged. Applications for development should take into account, as appropriate, the Department of Housing, Local Government and Heritage's (2022) "Nature-based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas - Water Sensitive Urban Design - Best Practice Interim Guidance Document".

In some exceptional cases, and at the discretion of the Council, where it is demonstrated that SuDS devices are not feasible, approval may be given to install underground attenuation tanks or enlarged pipes in conjunction with other devices to achieve the required water quality. Such alternative measures will only be considered as a last resort. Proposals for surface water attenuation systems should include maintenance proposals and procedures.

Urban developments, both within developments and within the public realm, should seek to minimise and limit the extent of hard surfacing and paving and require the use of sustainable drainage techniques for new development or for extensions to existing developments, in order to reduce the potential impact of existing and predicted flood risk. Development proposals should be accompanied by a comprehensive SuDS assessment that addresses run-off rate, run-off quality and its impact on the existing habitat and water quality.

For larger sites (i.e. multiple dwellings or commercial units) master planning should ensure that existing flow routes are maintained, through the use of green infrastructure. In addition, where multiple individual proposals are being made SUDS should be integrated where appropriate and relevant.

All proposed development, should consider the impact of surface water flood risks on drainage design e.g. in the form of a section within the flood risk assessment (for sites in Flood Zone A or B) or part of a surface water management plan.

Pluvial flood risk is likely to be present in local areas, however; it is not taken into account in the delineation of flood zones. Furthermore, PFRA indicative pluvial maps (2012) are not considered to be reliable for the purposes of zoning or decision-making. Particular attention should be given to development in low-lying areas which may act as natural ponds for collection of run-off. The drainage design should ensure no increase in flood risk to the site, or the downstream catchment. Where possible, and particularly in areas of new development, floor levels should be at an appropriate height above adjacent roads and hard standing areas to reduce the consequences of any localised flooding. Where this is not possible, an alternative design appropriate to the location may be prepared.

Further to the above, proposals for development should consider the Construction Industry Research and Information Association (CIRIA) SuDS Manual 2015 and any future update of this guidance and Greater Dublin Strategic Drainage Study documents in designing SUDS solutions, including the New Development Policy, the Final Strategy Report, the Code of Practice and "Irish SuDS: guidance on applying the GDSDS surface water drainage criteria".

Section 4 Flood and Drainage Provisions

4.1 Introduction

In order to comply with *The Planning System and Flood Risk Management - Guidelines for Planning Authorities* (Department of the Environment, Heritage and Local Government and Office of Public Works, 2009) and Department of the Environment, Community and Local Government Circular (*PL 2/2014*) and in order to contribute towards flood risk management within the Plan area, the measures below have been integrated into the Dundalk Local Area Plan and the existing, already in force, Louth County Development Plan 2021-2027 (as varied).

4.2 Land Use Zoning

That Flood Zones identified by the SFRA were used in line with the requirements provided for by the Flood Guidelines for land uses in Flood Zones A and B.

4.3 Integration of flood risk management provisions into the Louth County Development Plan

Provisions relating to flood risk management have already been integrated into the Louth County Development Plan 2021-2027 (as varied). These are detailed on Table 4.

Table 4 County Development Plan Provisions relating to Flood Risk Management

Provision
Section 10.2.5 Sustainable urban drainage systems and Surface Water **IU 19** To require the use of Sustainable Drainage Systems to minimise and limit the extent of hard surfacing and paving and require the use of SuDS measures be incorporated in all new development (including extensions to existing developments). All development proposals shall be accompanied by a comprehensive SuDS assessment including run-off quantity, run off quality and impacts on habitat and water quality. **IU 20** To require all development proposals meet the design criteria, (adjusted to reflect local conditions), and material designs contained in the Greater Dublin Strategic Drainage Study (GDSDS) and demonstrate how runoff is captured as close to source as possible with subsequent slow release to the drainage system and watercourse. **IU 21** To seek to avoid the discharge of additional surface water to combined sewers and promote Sustainable Urban Drainage Systems (SuDS) and solutions to maximise the capacity of towns with combined drainage systems. **IU 22** To ensure all new development incorporates appropriate measures to protect existing water bodies, through appropriate treatment of runoff. In particular, discharges from car parks shall be appropriately treated so as to remove pollutant materials. **IU 23** To ensure all new developments provide for separated drainage systems. **IU 24** To encourage particularly in buildings of increased height the provision of green roofs and green walls as an integrated part of Sustainable Drainage Systems (SuDS) and which provide benefits for biodiversity, wherever possible. **Section 10.3 Flood Risk Management** **IU 25** To ensure that no development including clearing or storage of materials takes place within a minimum distance of 10m measured from each bank of any river, stream or watercourse. **IU 26** To reduce the risk of new development being affected by possible future flooding by: • Avoiding development in areas at risk of flooding and • Where development in floodplains cannot be avoided, taking a sequential approach to flood risk management based on avoidance, reduction and adaptation to the risk.

Provision
IU 27 To ensure all proposals for development falling within Flood Zones A or B are consistent with the "The Planning System and Flood Risk Management – Guidelines for Planning Authorities" 2009. Proposals for development identified as being vulnerable to flooding must be supported by a site specific Flood Risk Assessment and demonstrate to the satisfaction of the Planning Authority that the development and its infrastructure will avoid significant risks of flooding and not exacerbate flooding elsewhere. In Flood Zone C, where the probability of flooding is low (less than 0.1%), site-specific Flood Risk Assessment may be required and the developer should satisfy themselves that the probability of flooding is appropriate to the development being proposed. The County Plan SFRA datasets and the most up to date CFRAM Programme climate scenario mapping should be consulted by prospective applicants for developments in this regard and will be made available to lower-tier Development Management processes in the Council. Applications for development in flood vulnerable zones, including those at risk under the OPW's Mid-Range Future Scenario, shall provide details of structural and non-structural risk management measures, such as those relating to floor levels, internal layout, flood-resilient construction, emergency response planning and access and egress during flood events. **IU 28** Where a site specific Flood Risk Assessment demonstrates that there are significant residual flood risks to a proposed development or its occupiers in conflict with "The Planning System and Flood Risk Management – Guidelines for Planning Authorities" 2009, planning permission will normally not be granted unless the requirements of Section 5.28 'Assessment of minor proposals in areas of flood risk' can be satisfied. **IU 29** To implement the Flood Risk Management Measures as detailed in the Neagh Bann Flood Risk Management Plan, the Eastern Flood Risk Management Plan and the Dunleer Flood Risk Management Plan, ensuring that proposals for development support and do not impede the progression of these measures. Louth County Council will, in partnership with the Office of Public Works (OPW) deliver the following Flood Relief Schemes: • Dundalk, Blackrock and Ardee; • Drogheda and Baltray; and • Carlingford and Greenore. **IU 30** To work with the Office for Public Works in the development and implementation of catchment-based strategies for the management of flood risk – including those relating to storage and conveyance. **IU 31** To contribute towards the improvement and/or restoration of the natural flood risk management functions of flood plains subject to compliance with the environmental legislation and availability of resources. **IU 32** To ensure each flood risk management activity is examined to determine actions required to embed and provide for effective climate change adaptation as set out in the OPW Climate Change Sectoral Adaptation Plan Flood Risk Management applicable at the time. **IU 33** Where a portion of a site is at risk of flooding, the lands at risk will be subject to the sequential approach to ensure first and foremost that new development is directed towards lands at low risk of flooding; and to restrict the type of development to that 'appropriate' to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines. **IU 34** To consult with the Office of Public Works (OPW) in relation to proposed developments in the vicinity of drainage channels and rivers for which the OPW are responsible. **IU 35** To consult with the Office of Public Works (OPW) in relation to proposed developments which include the construction, replacement or alteration of a bridge or culvert and to require that the developers obtain consent from the OPW under Section 50 of the EU (Assessment and Management of Flood Risks) Regulations 2010 and Section 50 of the Arterial Drainage Act 1945, where appropriate.

4.4 Integration of flood risk management provisions into the Local Area Plan

Further to the measures relating to land use zoning integrated into the LAP (see Section 4.2 above) and those already in force through the Louth County Development Plan 2021-2027 (as varied) (see Section 4.3 above), a number of other measures relating to flood risk and drainage have been integrated into the Local Area Plan as detailed on Table 5. In combination, these provisions contribute towards a sustainable drainage strategy for the Plan area (see also Section 3.5 of this document).

Table 5 Local Area Plan Provisions relating to Flood Risk Management

Provision
9.4 Surface Water Management and Sustainable Urban Drainage System (SuDS) **INF 7** To require the use of sustainable drainage systems to minimise and limit the extent of hard surfacing and paving and require the use of SuDS measures be incorporated in all new development (including extensions to existing developments). All development proposals shall be accompanied by a comprehensive SuDS assessment including run-off quantity, run off quality and impacts on habitat and water quality and should have particular regard to nature-based solutions and section 3.5 of the accompanying Strategic Flood Risk Assessment in Volume 4, 'Sustainable Urban Drainage Systems and Surface Water Guidance and Strategy'.[10] **INF 8** To require that all development proposals meet the design criteria, (adjusted to reflect local conditions), and material designs contained in the Greater Dublin Strategic Drainage Study (GDSDS) and demonstrate how runoff is captured as close to source as possible with subsequent slow release to the drainage system and watercourse. **INF 9** To seek to avoid the discharge of additional surface water to combined sewers and promote Sustainable Urban Drainage Systems (SuDS) and solutions to maximise the capacity of Dundalk's combined drainage system. **INF 10** To ensure all new developments provide for separated drainage systems. **INF 11** To promote rainwater harvesting and grey water use in all developments and in particular for larger developments, as an alternative to attenuation. **INF 12** To encourage in all buildings, and particular in buildings of increased height, the provision of green roofs and green walls as an integrated part of Sustainable Drainage Systems (SuDS), wherever possible. **INF 13** To encourage the use of Nature based Sustainable Urban Drainage System (NbSUDS), when feasible, where streetscape enhancement programmes or resurfacing programmes are planned. **9.6 Flood Risk Management** **INF 17** To support the progression of the Dundalk and Blackrock Flood Relief Scheme and the delivery of associated infrastructure critical to the implementation of the Scheme; and to prohibit development that could prejudice the future delivery of the Scheme. **INF 18** To work closely with the OPW, property owners and other stakeholders in the progression and delivery of the Dundalk and Blackrock Flood Relief Scheme.

[10] Because of the infinite range of land use types and associated developments and designs that could occur on sites under this Plan, the full range of SuDS available should be considered, taking into account the recommendations and information provided in Section 3.5 of the SFRA report.

Provision
INF 19 To require all proposals for development falling within or adjacent to an identified flood zone(s) to submit a site-specific flood Risk Assessment, based on the most up to date information available, that demonstrates that the proposal identifies all sources of flood risk to and from the proposed development, can adequately manage and mitigate any flood risk arising from the development including details of any structural and non-structural risk management measures (e.g. floor levels, flood-resilient construction etc.), and will not exacerbate flood risk elsewhere[11,12]. **INF 20** With respect to climate change, Flood Risk Assessments shall apply the precautionary approach recommended in the Guidelines and shall consider climate change impacts and adaptation measures, including details of structural and non-structural flood risk management measures, such as those relating to floor levels, internal layout, flood-resistant construction, flood-resilient construction, emergency response planning and access and egress during flood events. The Local Area Plan SFRA datasets and the most up to date CFRAM Programme climate scenario mapping, together with the allowances to be provided for future flood risk management provided in the OPW's (2019) Flood Risk Management Climate Change Sectoral Adaptation Plan and the guidance on potential future scenarios contained therein, should be consulted by

[11] More information on requirements in relation to Structural and Non-Structural Risk Management Measures are provided in a footnote to this Policy Objective at Table 5 of the accompanying SFRA report in Volume 4.

[12] Applications for development in flood vulnerable zones shall provide details of structural and non-structural risk management measures to include, but not be limited to specifications of the following:

Floor Levels

In areas of limited flood depth, the specification of the threshold and floor levels of new structures shall be raised above expected flood levels to reduce the risk of flood losses to a building, by raising floor heights within the building structure using a suspended floor arrangement or raised internal concrete platforms.

When designing an extension or modification to an existing building, an appropriate flood risk reduction measure shall be specified to ensure the threshold levels into the building are above the design flood level. However, care must also be taken to ensure access for all is provided in compliance with Part M of the Building Regulations.

Where threshold levels cannot be raised to the street for streetscape, conservation or other reasons, the design shall specify a mixing of uses vertically in buildings - with less vulnerable uses located at ground floor level, along with other measures for dealing with residual flood risk.

Internal Layout

Internal layout of internal space shall be designed and specified to reduce the impact of flooding [for example, living accommodation, essential services, storage space for provisions and equipment shall be designed to be located above the predicted flood level]. In addition, designs and specifications shall ensure that, wherever reasonably practicable, the siting of living accommodation (particularly sleeping areas) shall be above flood level.

With the exception of single storey extensions to existing properties, new single storey accommodation shall not be deemed appropriate where predicted flood levels are above design floor levels. In all cases, specifications for safe access, refuge and evacuation shall be incorporated into the design of the development.

Flood-Resistant Construction

Developments in flood vulnerable zones shall specify the use of flood-resistant construction aimed at preventing water from entering buildings - to mitigate the damage floodwater caused to buildings.

Developments shall specify the use of flood resistant construction prepared using specialist technical input to the design and specification of the external building envelope – with measures to resist hydrostatic pressure (commonly referred to as "tanking") specified for the outside of the building fabric.

The design of the flood resistant construction shall specify the need to protect the main entry points for floodwater into buildings - including doors and windows (including gaps in sealant around frames), vents, air-bricks and gaps around conduits or pipes passing through external building fabric.

The design of the flood resistant construction shall also specify the need to protect against flood water entry through sanitary appliances as a result of backflow through the drainage system.

Flood-Resilient Construction

Developments in flood vulnerable zones that are at risk of occasional inundation shall incorporate design and specification for flood resilient construction which accepts that floodwater will enter buildings and provides for this in the design and specification of internal building services and finishes. These measures limit damage caused by floodwater and allow relatively quick recovery.

This can be achieved by specifying wall and floor materials such as ceramic tiling that can be cleaned and dried relatively easily, provided that the substrate materials (e.g. blockwork) are also resilient. Electrics, appliances and kitchen fittings shall also be specified to be raised above floor level, and one-way valves shall be incorporated into drainage pipes.

Emergency Response Planning

In addition to considering physical design issues for developments in flood vulnerable zones, the developer shall specify that the planning of new development also takes account of the need for effective emergency response planning for flood events in areas of new development.

Applications for developments in flood vulnerable zones shall provide details that the following measures will be put in place and maintained:

- Provision of flood warnings, evacuation plans and ensuring public awareness of flood risks to people where they live and work;
- Coordination of responses and discussion with relevant emergency services i.e. Local Authorities, Fire and Rescue, Civil Defence and An Garda Siochána through the SFRA; and
- Awareness of risks and evacuation procedures and the need for family flood plans.

Access and Egress During Flood Events

Applications for developments in flood vulnerable zones shall include details of arrangements for access and egress during flood events. Such details shall specify that: flood escape routes have been kept to publicly accessible land; such routes will have signage and other flood awareness measures in place, to inform local communities what to do in case of flooding; and this information will be provided in a welcome pack to new occupants.

Further Information

Further and more detailed guidance and advice can be found at http://www.flooding.ie and in the Building Regulations.

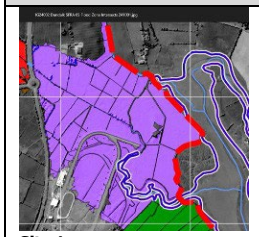
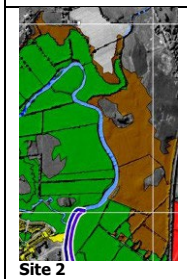
Provision
prospective applicants for developments in this regard and will be made available to lower-tier Development Management processes in the Council. **INF 21** Uses under all zoning objectives (apart from where the Justification Test outlined in the Flood Risk Management Guidelines has been passed or where the uses comprise minor development in existing developed areas, as outlined in Section 5.28 of the Guidelines as amended by Circular PL 2/2014) shall be limited to water-compatible uses in Flood Zone A, and less vulnerable or water-compatible uses in Flood Zone B[13]. Detailed, site-specific Flood Risk Assessment will be required in these areas. This limitation shall take primacy over any other provision relating to these land use zoning objectives. The Justification Test has been passed for the following Land Use Zonings: • Lands east of Bellews Bridge Road and north of Castletown Road, zoned A1 Existing Residential and A2 New Residential Phase 1 (Site 10 on SFRA Report Table 6 "Justification Tests"); • Dundalk Central Map 1, zoned A1 Existing Residential, B2 Neighbourhood Centre, B4 District Centre, C1 Mixed Use, E1 General Employment and G1 Community Facilities (Site 11 on SFRA Report Table 6 "Justification Tests"); • Dundalk Central Map 2, zoned A1 Existing Residential, B1 Town Centre, C1 Mixed Use, C2 Port Harbour Area, E1 General Employment, and G1 Community Facilities (Site 12 on SFRA Report Table 6 "Justification Tests"); • Lands built out north of Castletown River, zoned A1 Existing Residential and E1 General Employment (Site 13 on SFRA Report Table 6 "Justification Tests"); • Lands along the Point Road, zoned A1 Existing Residential (Site 14 on SFRA Report Table 6 "Justification Tests"); • Main Street, Blackrock, zoned B1 Town Centre (Site 17 on SFRA Report Table 6 'Justification Tests'); and • Lands west of Hill Street Bridge, zoned C1 Mixed Use (Site 18 on SFRA Report Table 6 'Justification Tests'). **Section 3.4.2 Spot Objective H - Lands west of Hill Street Bridge** Any development within the Flood Zone in this location shall be restricted to the provision of a vehicular and active travel access and service roads and ancillary infrastructure and other 'less Vulnerable development' as set out in Table 3.1 of 'The Planning System and Flood Risk Management Guidelines' (2009). **Section 9.6.2 Benefitting Lands** New developments proposed on lands benefitting from drainage district measures shall preserve access for maintenance. Applications for development on land identified as benefiting land may be prone to flooding, and as such site- specific flood risk assessments may be required in these areas.

4.5 Justification Tests

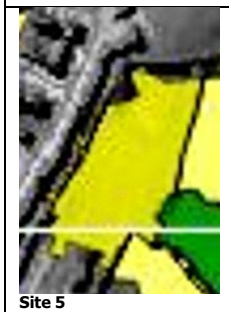
In order to meet the objectives of proper planning and sustainable development various uses are provided for in Flood Zones A and B. These uses have been subject to Justification Tests, as required by the Flood Guidelines, informed by the Council, which examine such proposals against various criteria - as detailed on Table 4.

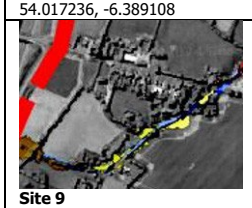
[13] Any amendments to extant permissions in Flood Zones A or B that have commenced development and construction is ongoing will be considered on a case-by-case basis and will require an updated site-specific flood risk assessment to be carried out.

Table 6 Justification Tests

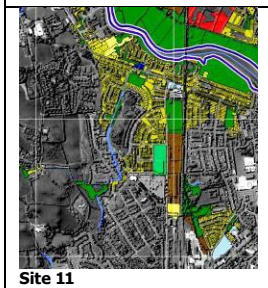
Site	Zoning in Draft Plan	Flood Zone	Justification Test (Fails, if one of the following fails; all must be passed for the test to be passed)						Overall Justification Test Result (Fail or Pass)
			Settlement targeted for growth under the NPF, RSES and/or CDP?	Is the zoning of the lands required to achieve the proper planning and sustainable development of the settlement and in particular has the required sub-criteria been satisfied[14]?				Has flood risk assessment to an appropriate level of detail been carried out as part of the SEA as part of the 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 impact elsewhere?	
				(i) – see footnote	(ii) – see footnote	(iii) – see footnote	(iv) – see footnote	(v) – see footnote	
 **Site 1** Dundalk Racecourse 54°01'25.5"N 6°22'49.2"W	D1 Tourism	A and B	Yes	No	No	No	No	No	A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.	The land use zoning at this site failed the Justification Test. Subsequently, the meaning of the zoning was altered by the integration of Policy Objective INF 21 into the Plan, which limits future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 "shall take primacy over any other provision relating to these land use zoning objectives".
 **Site 2** Lands to west of Armagh Road at Sportsman hall 54.026721, -6.411582	E1 General Employment	A and B	Yes	No	No	No	No	No	A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.	The land use zoning at this site failed the Justification Test. Subsequently, the meaning of the zoning was altered by the integration of Policy Objective INF 21 into the Plan, which limits future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 "shall take primacy over any other provision relating to these land use zoning objectives".
 **Site 3** Lands to east of Armagh Road adjacent Lios Dubh 54.020940, -6.404004	A2 New Residential Phase 1	B	Yes	No	No	No	No	No	A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.	The land use zoning at this site failed the Justification Test. Subsequently, the meaning of the zoning was altered by the integration of Policy Objective INF 21 into the Plan, which limits future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 "shall take primacy over any other provision relating to these land use zoning objectives".

[14] (i) Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement; (ii) Comprises significant previously developed and/or under-utilised lands; (iii) Is within or adjoining the core of an established or designated urban settlement; (iv) Will be essential in achieving compact and sustainable urban growth; and (v) 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.

 **Site 4** Lands to the east of Armagh road and west of Doylesfort Road 54.019138, -6.400323	A2 New Residential Phase 1	B	Yes	No	No	No	Yes – this is an infill site	No	A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.	The land use zoning at this site failed the Justification Test. however as part of a planning application on these lands (24/60321) a Site Specific Flood Risk Assessment was carried out which sets out a series of mitigating measures to demonstrate flood risk to the site can be adequately managed. Furthermore, Policy Objective INF 21 from the Plan would limit future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 "shall take primacy over any other provision relating to these land use zoning objectives".
 **Site 5** Lands north of Lismullen Grove	A1 Existing Residential	B	Yes	No	No	No	Yes – this is an infill site	No	A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.	The land use zoning at this site failed the Justification Test. Subsequently, the meaning of the zoning was altered by the integration of Policy Objective INF 21 into the Plan, which limits future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 "shall take primacy over any other provision relating to these land use zoning objectives".
 **Site 6** Lands south of the Castletown Road	G1 Community Facilities and A1 Existing Residential	A and B	Yes	No	No	No	No	No	A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.	The land use zoning at this site failed the Justification Test. Subsequently, the meaning of the zoning was altered by the integration of Policy Objective INF 21 into the Plan, which limits future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 "shall take primacy over any other provision relating to these land use zoning objectives".

 **Site 7** Racecourse Meadows, south of Racecourse Road. 54.017236, -6.389108	A2 New Residential Phase 1	A and B	Yes	No	No	No	No	No	A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.	The land use zoning at this site failed the Justification Test. However, there is an extant permission for a residential development on these lands that is currently under construction. Any future amendments or development on these lands will be subject to a site-specific flood risk assessment. Furthermore, Policy Objective INF 21 from the Plan would limit future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 "shall take primacy over any other provision relating to these land use zoning objectives".[15]
 **Site 8** Lands on the Racecourse at the junction with inner relief road 54.017236, -6.389108	A2 New Residential Phase 1	A and B	Yes	No	No	No	No	No	A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.	The land use zoning at this site failed the Justification Test. Subsequently, the meaning of the zoning was altered by the integration of Policy Objective INF 21 into the Plan, which limits future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 "shall take primacy over any other provision relating to these land use zoning objectives".
 **Site 9** Lands west of Greyacre Road between M1 54.015323, -6.442884	E1 General Employment and A2 New Residential Phase 1	A and B	Yes	No	No	No	No	No	A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.	The land use zoning at this site failed the Justification Test. Subsequently, the meaning of the zoning was altered by the integration of Policy Objective INF 21 into the Plan, which limits future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 "shall take primacy over any other provision relating to these land use zoning objectives".

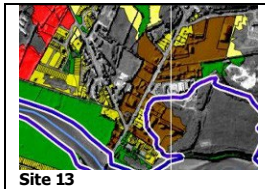
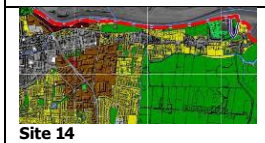
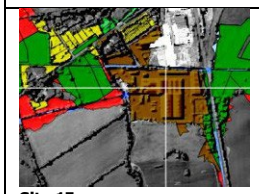
[15] With respect to Site 7, when preparing future land use plans for the town, the Council will consider substituting a land use zoning appropriate to the level of flood risk at this location, should the development in the area not go ahead or planning lapses with no permission to renew it.

 **Site 10** Lands east of Bellews Bridge Road and north of Castletown Road 54.015771, -6.420011	A1 Existing Residential and A2 New Residential Phase 1	A and B	Yes	Yes	Yes	Yes	Yes these are infill lands	Yes	A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures as detailed in the footnote associated with Table 5 in this Report[16]. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.	Pass
 **Site 11** Dundalk Central Map 1	A1 Existing Residential, B2 Neighbourhood Centre, B4 District Centre, C1 Mixed Use, E1 General Employment and G1 Community Facilities	A and B	Yes	Yes	Yes	Yes	Yes	Yes	A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures as detailed in the footnote associated with Table 5 in this Report [17]. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.	Pass
 **Site 12** Dundalk Central Map 2	A1 Existing Residential, B1 Town Centre, C1 Mixed Use, C2 Port Harbour Area, E1 General Employment, and G1 Community Facilities.	A and B	Yes	Yes	Yes	Yes	Yes	Yes	A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures as detailed in the footnote associated with Table 5 in this Report [18]. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.	Pass

[16] Potentially applicable flood risk management related provisions will include:
- County Development Plan Provisions relating to Flood Risk Management: IU 19, 20, IU 21, IU 22, IU 23, IU 24, IU 25, IU 26, IU 27, IU 28, IU 29, IU 30, IU 31, IU 32, IU 33, IU 34 and IU 35.
- Local Area Plan Provisions relating to Flood Risk Management: INF 7, INF 8, INF 9, INF 10, INF 11, INF 12, INF 13, INF 17, INF 18, INF 19 and INF 20.

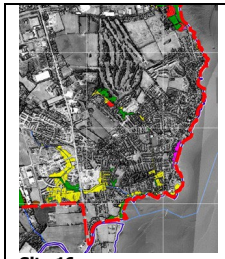
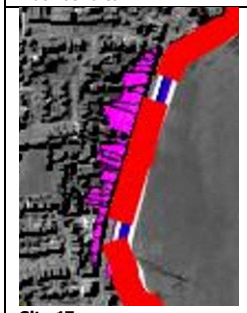
[17] Potentially applicable flood risk management related provisions will include:
- County Development Plan Provisions relating to Flood Risk Management: IU 19, 20, IU 21, IU 22, IU 23, IU 24, IU 25, IU 26, IU 27, IU 28, IU 29, IU 30, IU 31, IU 32, IU 33, IU 34 and IU 35.
- Local Area Plan Provisions relating to Flood Risk Management: INF 7, INF 8, INF 9, INF 10, INF 11, INF 12, INF 13, INF 17, INF 18, INF 19 and INF 20.

[18] Potentially applicable flood risk management related provisions will include:
- County Development Plan Provisions relating to Flood Risk Management: IU 19, 20, IU 21, IU 22, IU 23, IU 24, IU 25, IU 26, IU 27, IU 28, IU 29, IU 30, IU 31, IU 32, IU 33, IU 34 and IU 35.
- Local Area Plan Provisions relating to Flood Risk Management: INF 7, INF 8, INF 9, INF 10, INF 11, INF 12, INF 13, INF 17, INF 18, INF 19 and INF 20.

 **Site 13** Lands built out north of Castletown River	A1 Existing Residential and E1 General Employment	A and B	Yes	Yes	Yes	Yes	Yes	Yes	A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures as detailed in the footnote associated with Table 5 in this Report [19]. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.	Pass
 **Site 14** Lands along the Point Road and eitherside of N2	A1 Existing Residential, E1 general Employment and J2 Public Infrastructure B5 Retail, Leisure and Recreation G1 Community uses.	A and B	Yes	Yes	Yes	Yes	Yes	Yes	A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures as detailed in the footnote associated with Table 5 in this Report [20]. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.	Pass
 **Site 15** Brewery Business Park and Ardee Road 53.990870, -6.410978	E1 General Employment, A1 Existing Residential	A and B	Yes	Yes	Yes	Yes	Yes	No	A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.	The land use zoning at this site failed the Justification Test. Subsequently, the meaning of the zoning was altered by the integration of Policy Objective INF 21 into the Plan, which limits future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 "shall take primacy over any other provision relating to these land use zoning objectives".

[19] Potentially applicable flood risk management related provisions will include:
- County Development Plan Provisions relating to Flood Risk Management: IU 19, 20, IU 21, IU 22, IU 23, IU 24, IU 25, IU 26, IU 27, IU 28, IU 29, IU 30, IU 31, IU 32, IU 33, IU 34 and IU 35.
- Local Area Plan Provisions relating to Flood Risk Management: INF 7, INF 8, INF 9, INF 10, INF 11, INF 12, INF 13, INF 17, INF 18, INF 19 and INF 20.

[20] Potentially applicable flood risk management related provisions will include:
- County Development Plan Provisions relating to Flood Risk Management: IU 19, 20, IU 21, IU 22, IU 23, IU 24, IU 25, IU 26, IU 27, IU 28, IU 29, IU 30, IU 31, IU 32, IU 33, IU 34 and IU 35.
- Local Area Plan Provisions relating to Flood Risk Management: INF 7, INF 8, INF 9, INF 10, INF 11, INF 12, INF 13, INF 17, INF 18, INF 19 and INF 20.

 **Site 16** Blackrock area	A1 Existing Residential B1 Town or Village Centre	A and B	Yes	No	No	No	No	No	A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.	The land use zoning at this site failed the Justification Test. Subsequently, the meaning of the zoning was altered by the integration of Policy Objective INF 21 into the Plan, which limits future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 "shall take primacy over any other provision relating to these land use zoning objectives".
 **Site 17 Blackrock Central**	B1 Town or Village Centre	A and B	Yes	Yes	Yes	Yes	Yes	Yes	A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures as detailed in the footnote associated with Table 5 in this Report [21]. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.	Pass
 **Site 18:** Lands adjacent to Hill Street Bridge	C1 Mixed Use Zoning	A and B	Yes	Yes	Yes	Yes	Yes	Yes	A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures as detailed in the footnote associated with Table 5 in this Report [22]. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.	Pass

[21] Potentially applicable flood risk management related provisions will include:
- County Development Plan Provisions relating to Flood Risk Management: IU 19, 20, IU 21, IU 22, IU 23, IU 24, IU 26, IU 27, IU 28, IU 29, IU 30, IU 31, IU 32 and IU 33.
- Local Area Plan Provisions relating to Flood Risk Management: INF 7, INF 8, INF 9, INF 10, INF 11, INF 12, INF 13, INF 17, INF 18, INF 19 and INF 20.

[22] Potentially applicable flood risk management related provisions will include:
- County Development Plan Provisions relating to Flood Risk Management: IU 19, 20, IU 21, IU 22, IU 23, IU 24, IU 26, IU 27, IU 28, IU 29, IU 30, IU 31, IU 32, IU 33 and IU 35.
- Local Area Plan Provisions relating to Flood Risk Management: INF 7, INF 8, INF 9, INF 10, INF 11, INF 12, INF 13, INF 17, INF 18, INF 19 and INF 20.

Section 5 Conclusion

Louth County Council has prepared and adopted a Local Area Plan (LAP) for Dundalk under the Planning and Development Act 2000 (as amended). The Plan sets out an overall strategy for the proper planning and sustainable development over the years 2025-2031.

The LAP should be read in conjunction with the Louth County Development Plan 2021-2027 (as varied), which sets out the overarching development strategy for the County. Where conflicting policy objectives arise between the County Development Plan and the LAP, the policy objectives of the relevant County Development Plan shall take precedence.

The general development management standards, zoning descriptions and policies and objectives in the County Development Plan (including provisions relating to flood risk management and drainage) apply to the Plan area, while additional policy objectives that are specific to Dundalk are included in the LAP.

In addition, land use zoning contained within the Plan has been informed by the SFRA process and associated delineation of flood risk zones. The detailed Plan preparation process undertaken by the Planning Department combined with specialist input from the SFRA process facilitated zoning that helps to avoid inappropriate development being permitted in areas of high flood risk.

Appendix I: Summary of the requirements of the Flood Guidelines for land uses in Flood Zones

Requirements relating to land uses in Flood Zones as set out in the Department of Environment, Heritage and Local Government (DEHLG) and Office of Public Works (OPW) 2009 Flood Guidelines (including at Chapter 3 Principles and Key Mechanisms and Chapter 5 Flooding and Development Management) and Departmental Circular PL2/2014 should be adhered to.

- The Sequential Approach, including the Justification test -

The key principles of the Guidelines' risk-based sequential approach (see Figure 1) are:

- Avoid development in areas at risk of flooding. If this is not possible, consider substituting a land use that is less vulnerable to flooding. Only when both avoidance and substitution cannot take place should consideration be given to mitigation and management of risks.

- Inappropriate types of development that would create unacceptable risks from flooding should not be planned for or permitted.

- Exceptions to the restriction of development due to potential flood risks are provided for through the use of a Justification Test, where the planning need and the sustainable management of flood risk to an acceptable level must be demonstrated.

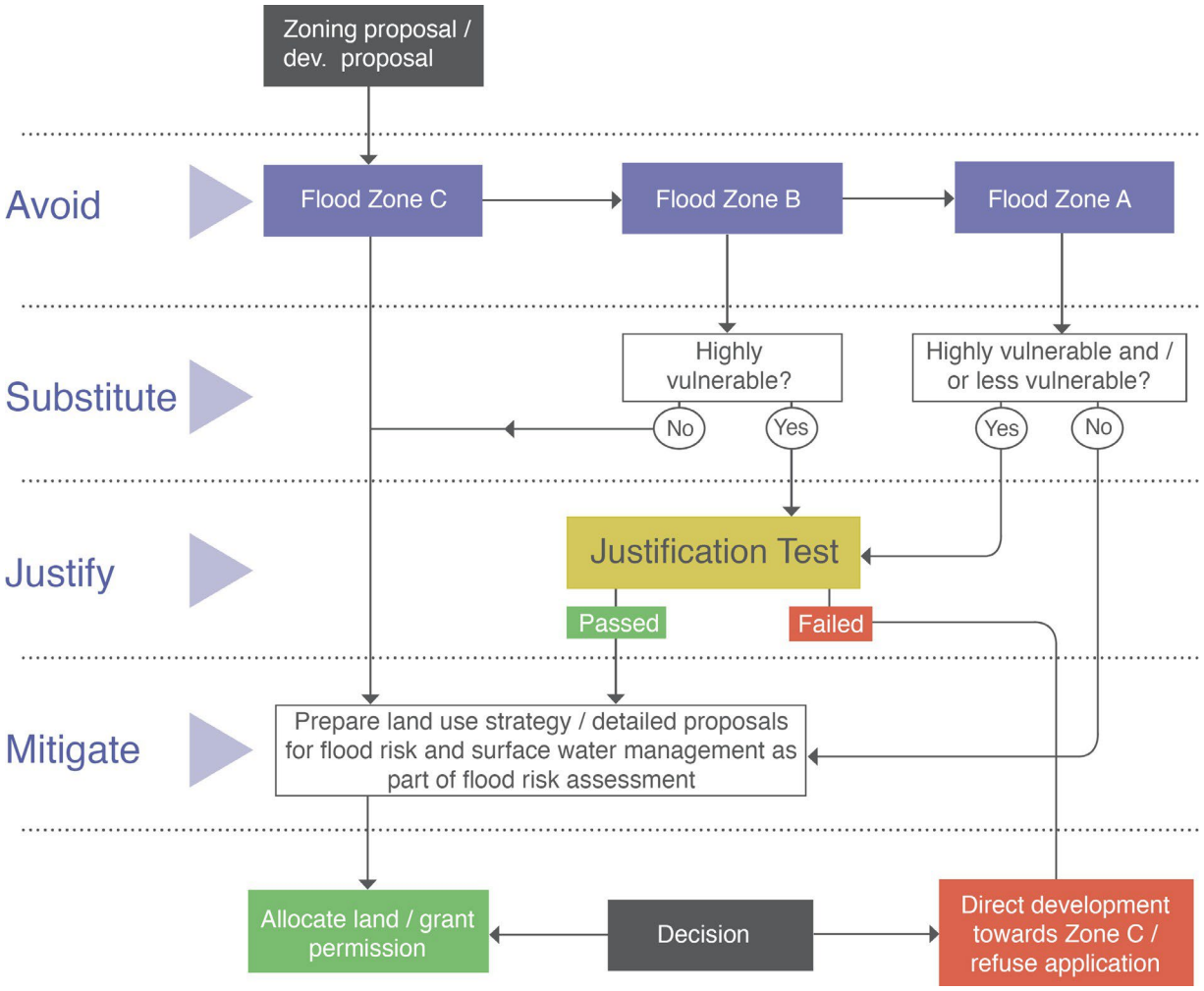


Figure 1 Sequential Approach Process[23]

In summary, the **planning implications** for each of the flood zones are:

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

[23] Flood Zone C covers all areas outside of Zones A and B

would need to meet the normal range of other proper planning and sustainable development considerations.

Table 7 overleaf classifies the vulnerability of different types of development while Table 8 identifies the appropriateness of development belonging to each vulnerability class within each of the flood zones as well as identifying what instances in which the Justification Test should be undertaken. Inappropriate development that does not meet the criteria of the Justification Test should not be considered at the plan-making stage or approved within the development management process.

Table 7 Classification of vulnerability of different types of development

Vulnerability class	Land uses and types of development which include*:
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; and 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 (SEVESO sites, IPPC sites, etc.) in the event of flooding.
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; and 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; and 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 on their own merits	

Table 8 Vulnerability Classes and Flood Zones

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

The **Justification Test** which is referred to as part of the Sequential Approach is an assessment of whether a development proposal within an area at risk of flooding meets specific criteria for proper planning and sustainable development and demonstrates that it will not be subject to unacceptable risk nor increase flood risk elsewhere. The Justification Test should be applied only where development is within flood risk areas that would be defined as inappropriate under the screening test of the sequential risk based approach outlined above. This Justification Test is shown below.

Where, as part of the preparation and adoption or variation and amendment of a development/local area plan[1], a planning authority is considering the future development of areas in an urban settlement that are at moderate or high risk of flooding, for uses or development vulnerable to flooding that would generally be inappropriate as set out in Table 3.2, all of the following criteria must be satisfied:

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:

(i) Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement[2];

(ii) Comprises significant previously developed and/or under-utilised lands;

(iii) Is within or adjoining the core[3] of an established or designated urban settlement;

(iv) Will be essential in achieving compact and sustainable urban growth; and

(v) 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.[4]

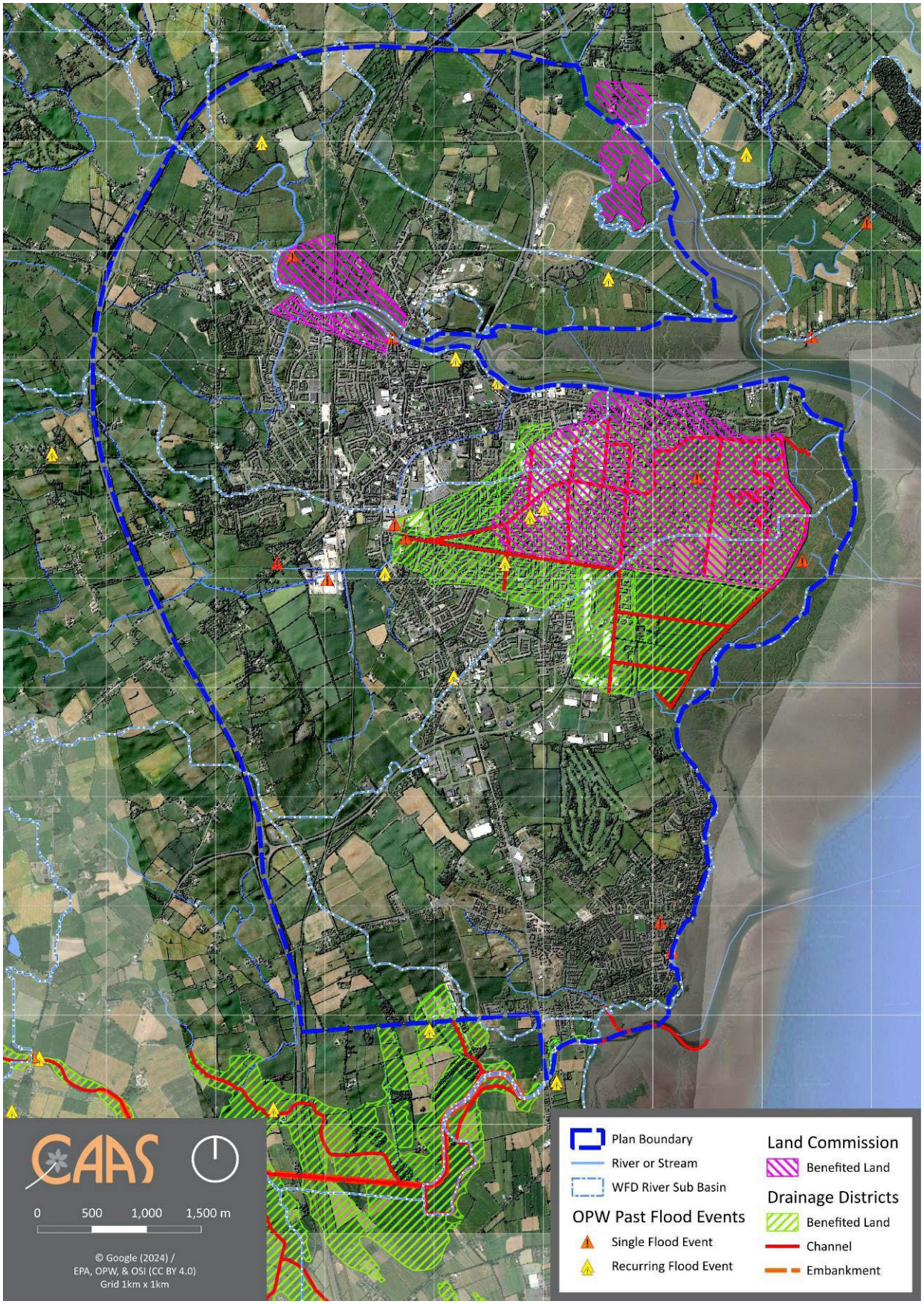
3 A flood risk assessment to an appropriate level of detail has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process, which demonstrates that flood risk to the development can be adequately managed and the use or development of the lands 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.

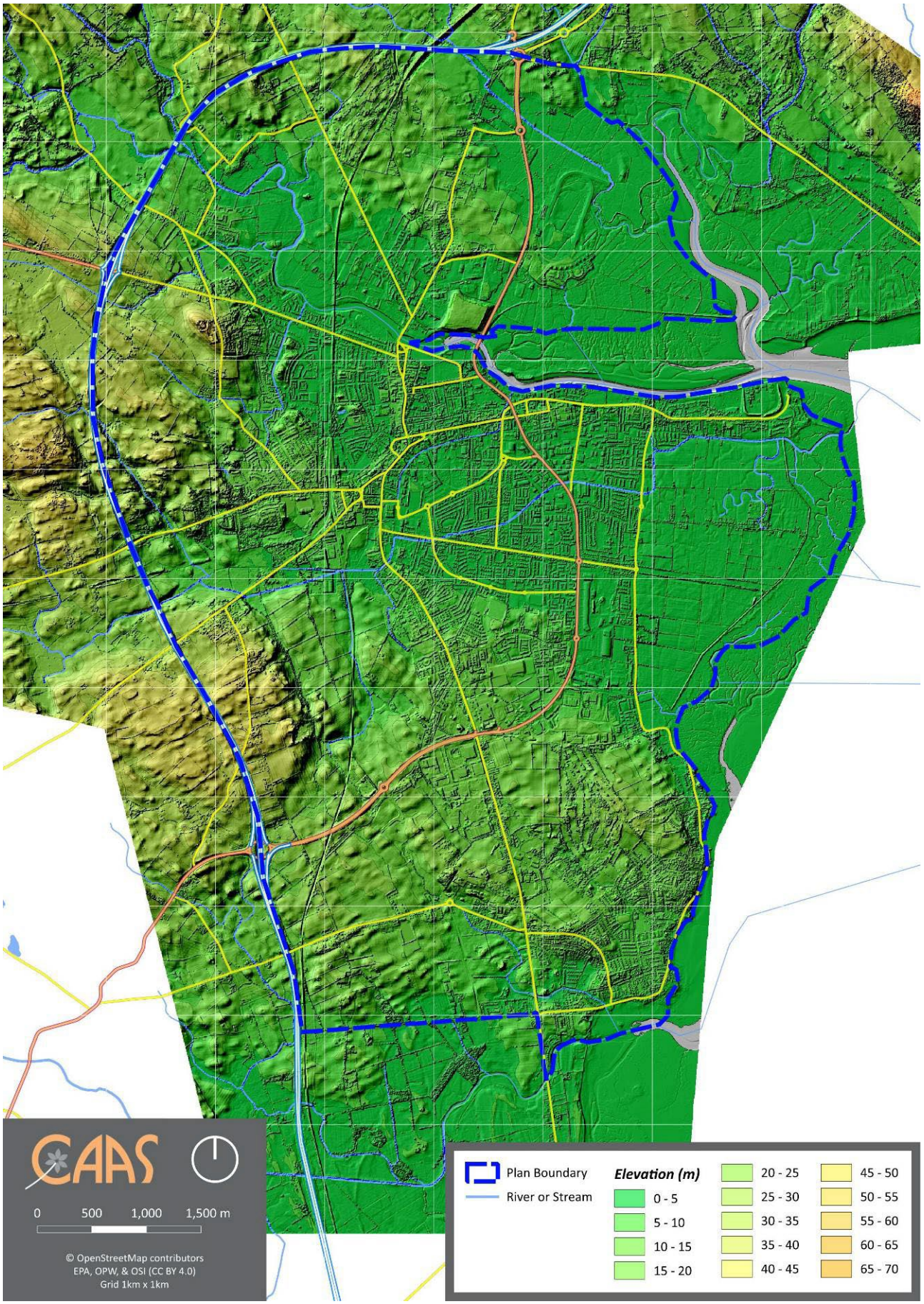
Figure 2 Justification Test[24]

[24] Footnotes: [1] Including Strategic Development Zones and Section 25 Schemes in the area of the Dublin Docklands Development Authority [2]In the case of Gateway planning authorities, where a number of strategic growth centres have been identified within the overall area of the authority, the Justification Test may be applied for vulnerable development within each centre. [3] See definition of the core of an urban settlement in Glossary of Terms. [4] This criterion may be set aside where section 4.27b applies.

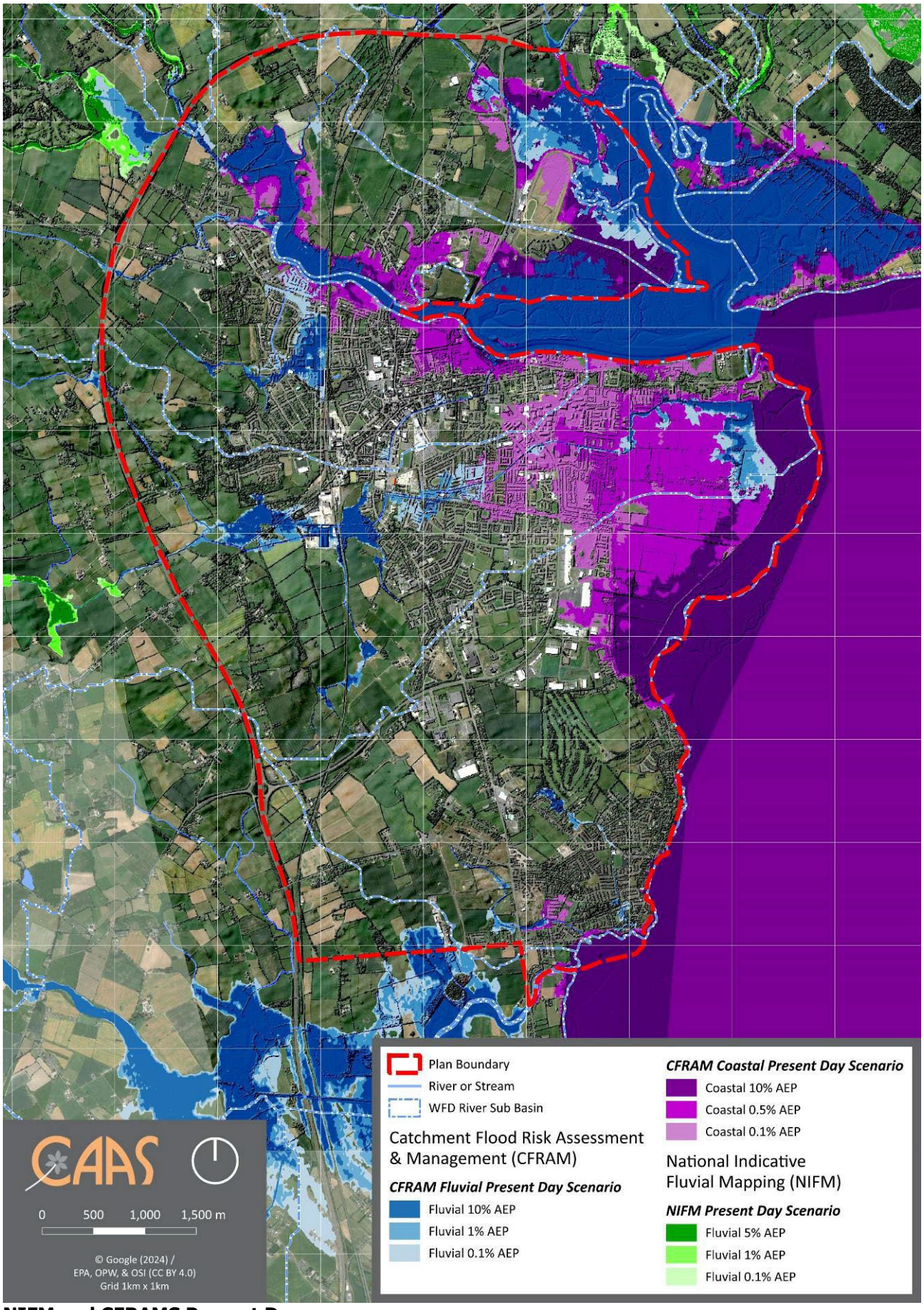
Appendix II: Selection of Flood Risk Indicator Mapping and Flood Zone Mapping



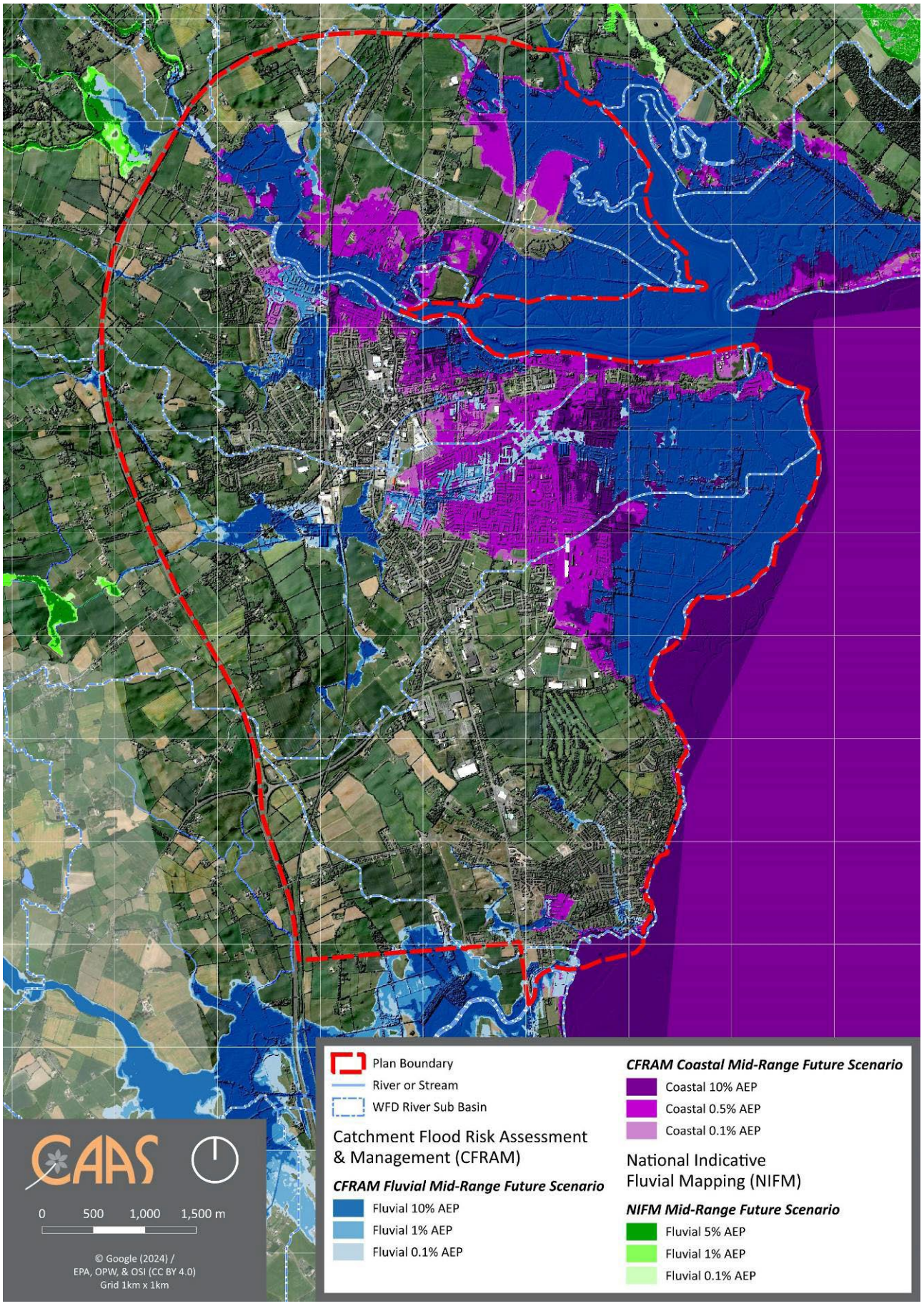
Historical Indicators


CAAS
0
500
1,000
1,500 m
© OpenStreetMap contributors
EPA, OPW, & OSI (CC BY 4.0)
Grid 1km x 1km
Plan Boundary
River or Stream
Elevation (m)
0 - 5
5 - 10
10 - 15
15 - 20
20 - 25
25 - 30
30 - 35
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70

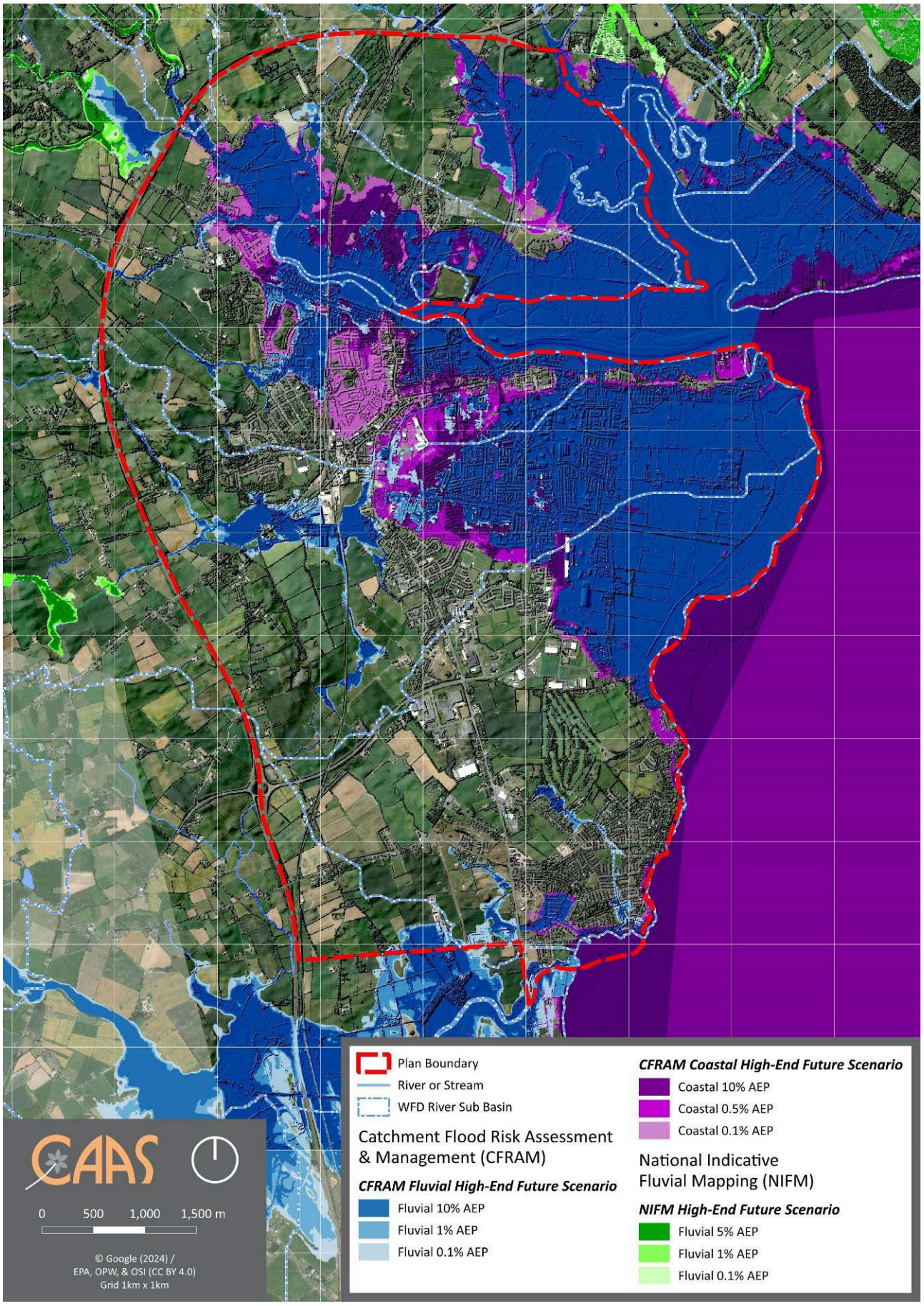
Topography



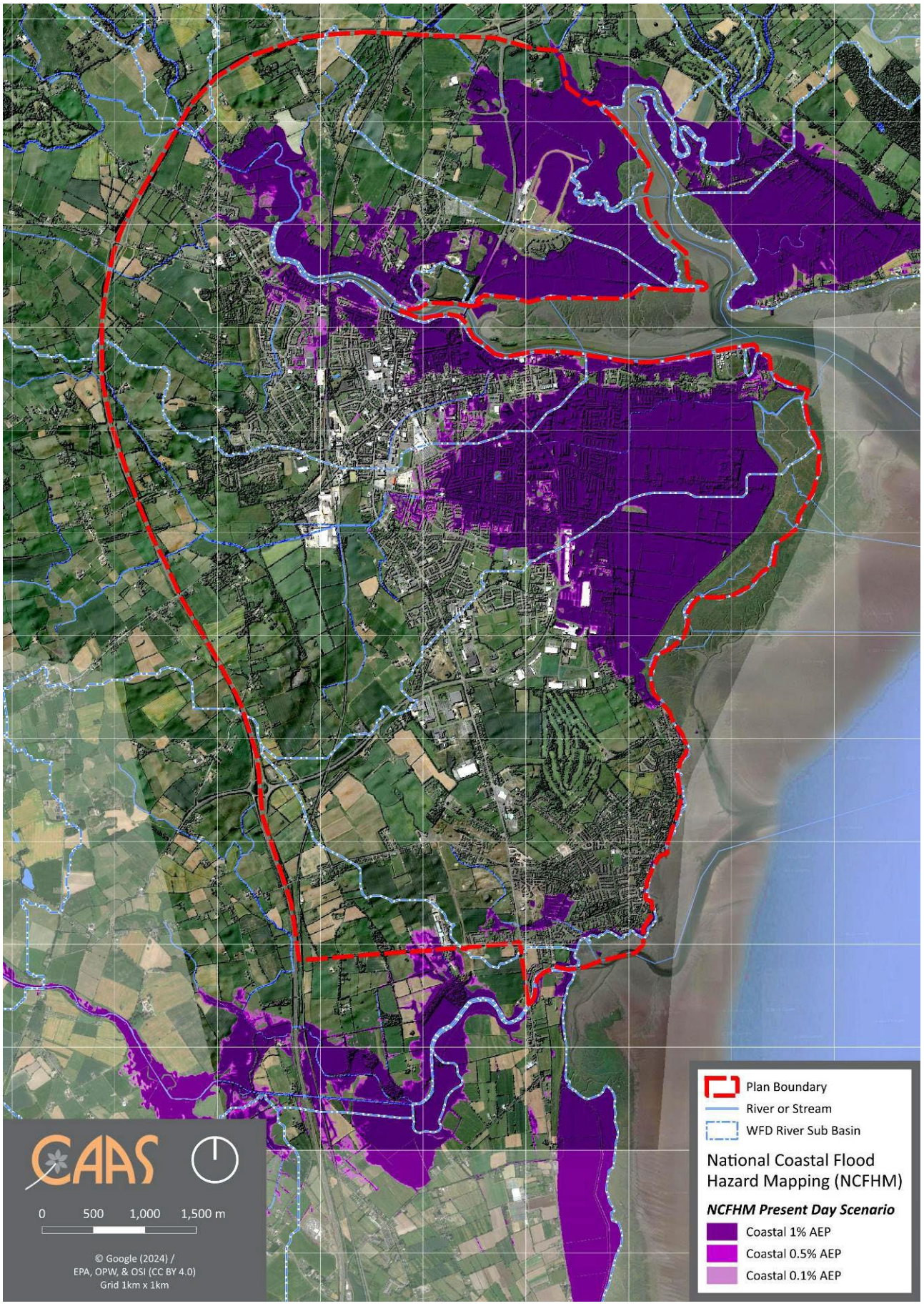
NIFM and CFRAMS Present Day



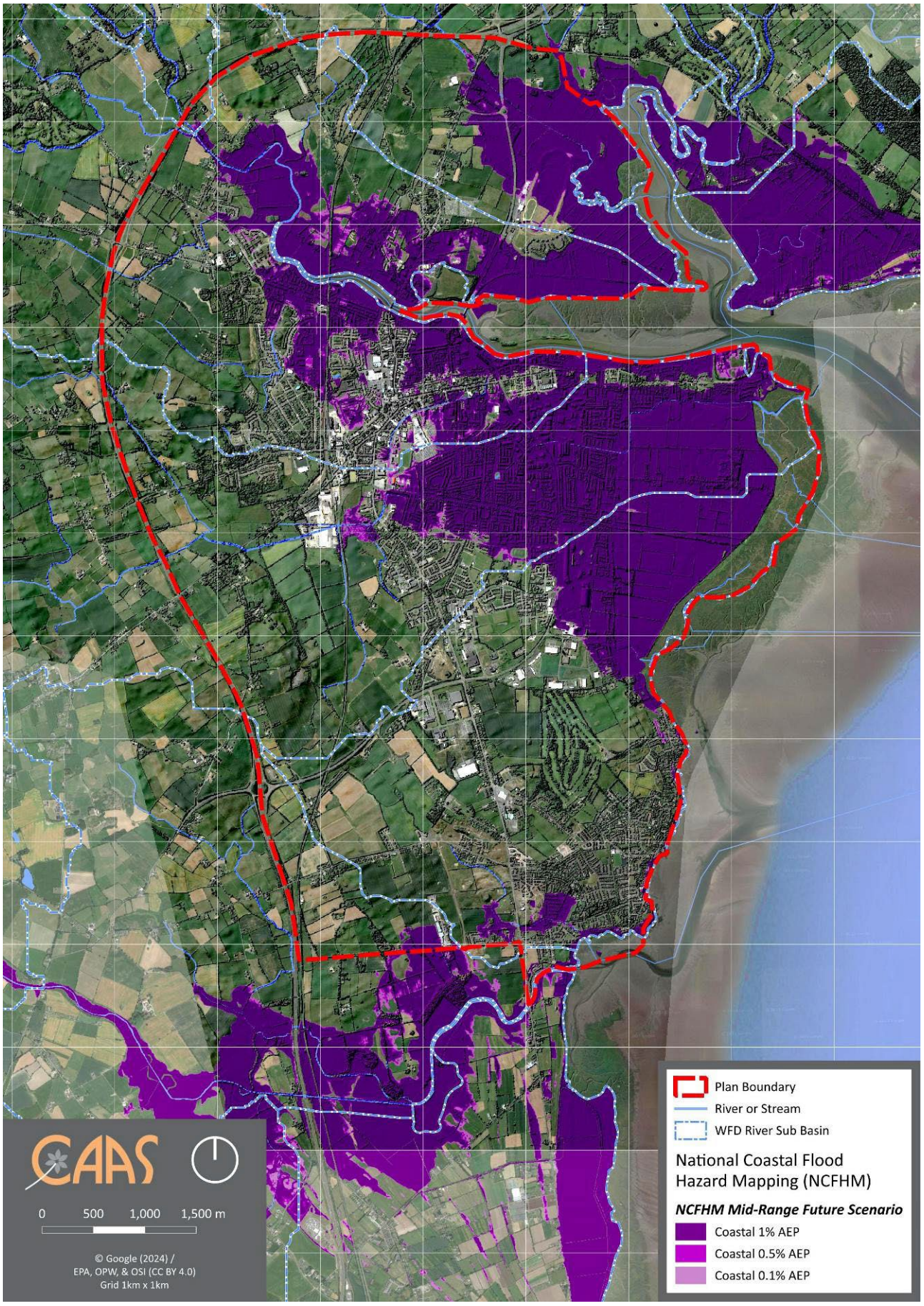
NIFM and CFRAMS Mid-Range



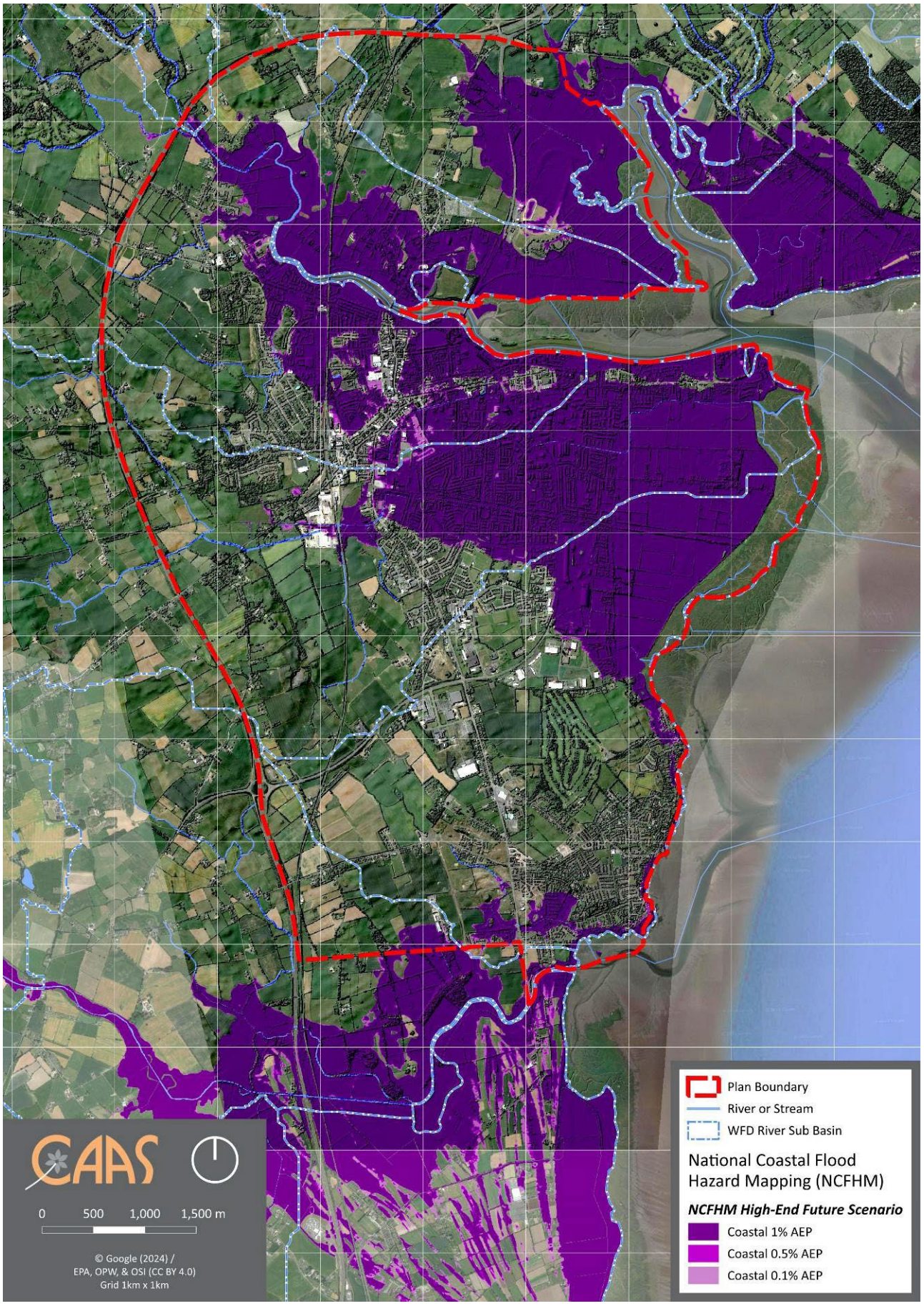
NIFM and CFRAMS High End



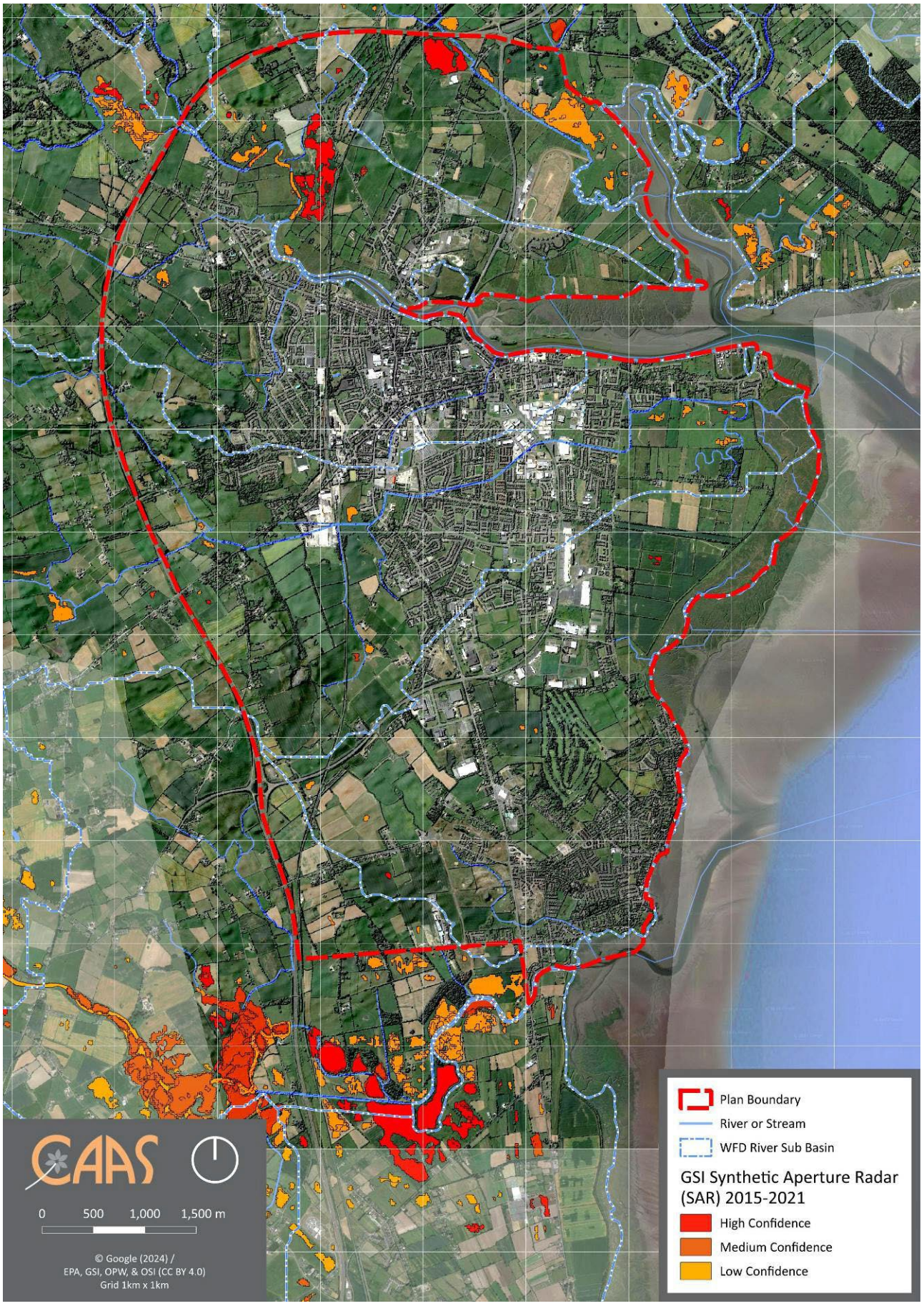
NCHFM Present Day



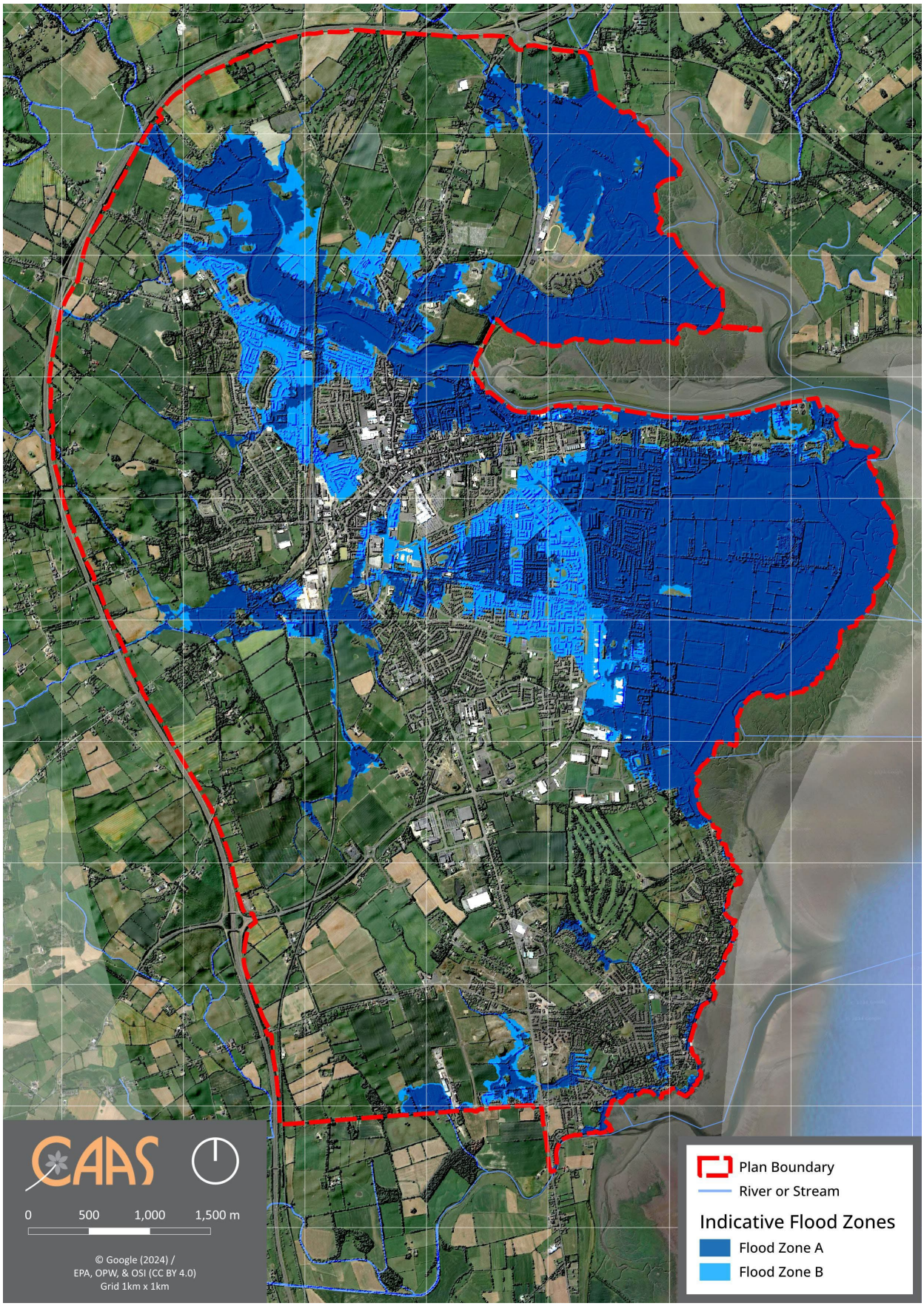
NCHFM Mid-Range



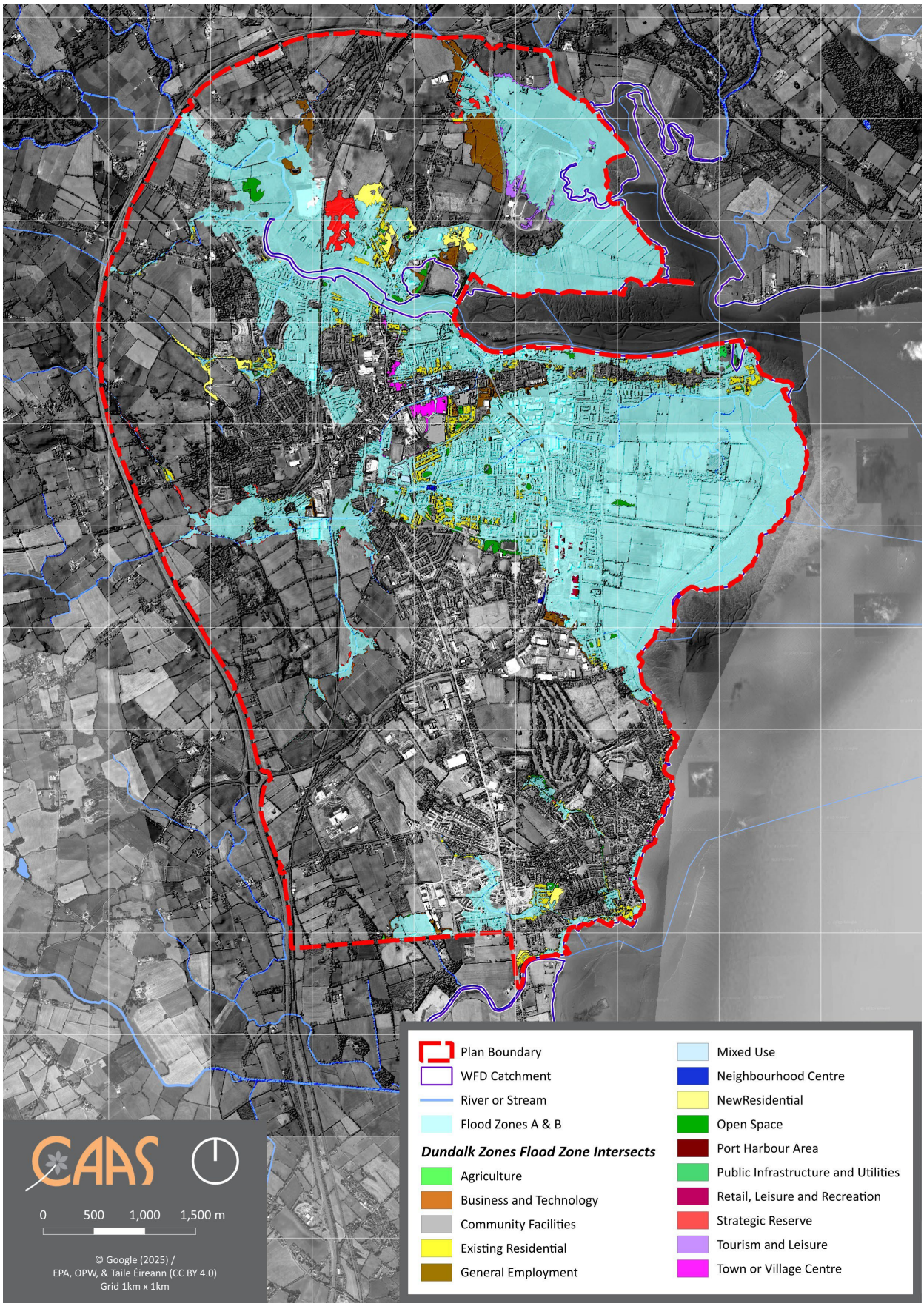
NCHFM High End



Predictive Groundwater Flood Mapping

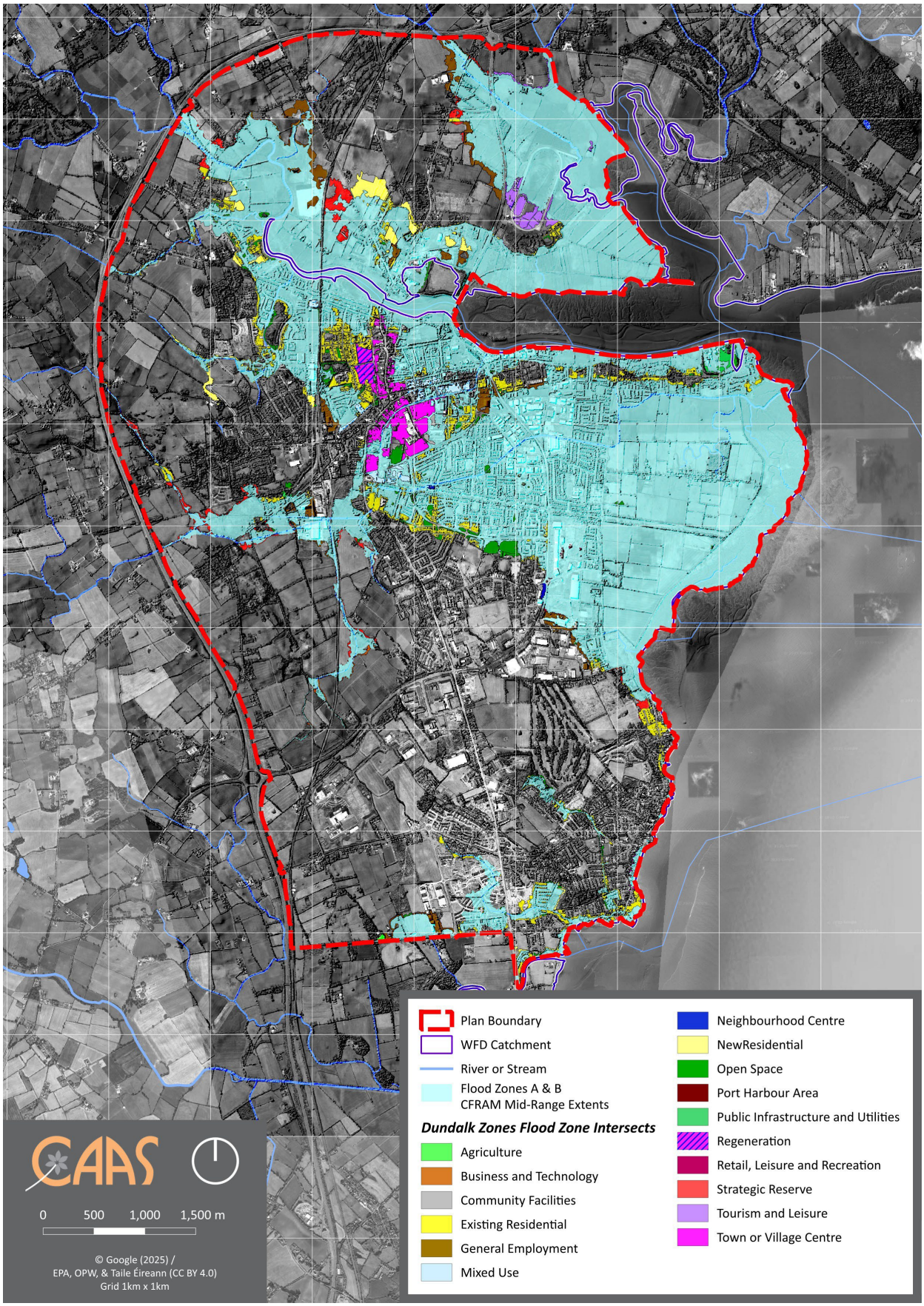


Flood Zones A and B



Flood Risk Overlaps with Land Use Zoning – Mid Range Future Climate Scenario[25]

[25] This map shows the combined Present Day Flood Zones A and B in light blue and the various land use zonings in areas adjacent to the combined Present Day Flood Zones A and B that are additionally identified as being at elevated risk under the Mid-Range Future Climate Scenario Mapping.



Flood Risk Overlaps with Land Use Zoning – High End Future Climate Scenario[26]

[26] This map shows the combined Mid-Range Future Climate Scenario Mapping of Flood Zones A and B in light blue and the various land use zonings in areas adjacent to the combined Mid-Range Future Climate Scenario Mapping of Flood Zones A and B that are additionally identified as being at elevated risk under the High-End Future Climate Scenario Mapping.