



Derry City & Strabane
District Council

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DERRY CITY & STRABANE DISTRICT COUNCIL

LOCAL DEVELOPMENT PLAN (LDP) 2032



DRAFT PLAN STRATEGY

Evidence Base EVB 25: Development and Flooding, December 2019

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DERRY CITY AND STRABANE DISTRICT COUNCIL

LOCAL DEVELOPMENT PLAN (LDP) 2032



EVIDENCE BASE PAPER EVB 25: Development and Flooding

This Document is one in a series which comprises the evidence base that informs the preparation of the Derry City and Strabane District Local Development Plan (LDP 2032) Plan Strategy.

It builds upon the suite of thematic Topic Papers prepared and published alongside the LDP Preferred Options Paper (POP), which established the May 2017 baseline position and identified the key issues that needed to be addressed by the LDP.

This Flooding and Development Evidence Base paper updates the baseline POP position and sets out the evidence base that has informed the strategy, designations and policies within the draft LDP Plan Strategy. Evidence has been informed by feedback from public consultation, discussions with Elected Members, input from statutory consultees, stakeholder groups, from other Departments within the Council, liaison with adjoining Councils and through the iterative Sustainability Appraisal process.

The Evidence Base is published as a ‘supporting document’ in accordance with Article 15(a) of the Planning (LDP) Regulations (NI) 2015.

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1.0 Introduction to Paper

- 1.1 The information presented in this paper assists the Council in developing an informed and innovative approach to setting clearly defined aims and objectives in relation to Planning and Flood Risk in the District, as well as considering their implications for other developments and land uses.
- 1.2 This paper provides the evidence base information to assist the Council in considering how the LDP can facilitate development while considering flood risk over the plan period. This enables the Council to begin to:
- make informed planning decisions, particularly within the plan making context;
 - consider baseline information which informs planning policy making at local level; and
 - understand the link between national policy, regional policy and the development of other strategies such as the Inclusive Strategic Growth Plan 2017 – 2032 (SGP).
- 1.3 This paper covers drainage, rivers and flood risk and provides an assessment of how existing planning policies take account of the Regional Development Strategy (RDS), the Strategic Planning Policy Statement (SPPS), the Sustainability Appraisal themes and DCSDC objectives through the LDP objectives.

2.0 Legislative and Policy Context

- 2.1 Article 5 of the Planning Act (Northern Ireland) 2011 requires that the creation of planning policy as part of the Plan Strategy must be done with the objective of furthering sustainable development and in doing so, must take account of policies and guidance issued by OFMDFM, DOE and DRD¹, such as the Regional Development Strategy (RDS) 2035 and Strategic Planning Policy Statement (SPPS).
- 2.1 Section 25 of the Northern Ireland (Miscellaneous Provisions) Act 2006 requires that all NI government Departments and District Councils, in exercising their functions, act in a way they consider best calculated to contribute to the achievement of sustainable development.
- 2.2 The duty of Community Planning, introduced in April 2015, requires the Council to lead the process of creating a long-term vision for the social, environmental and economic well-being of the area and its citizens. The Local Government Act introduced a statutory link between the resultant Community Plan and the Council's Local Development Plan (LDP), in that the LDP must take account of the Community Plan in its preparation. Therefore, it provides the key context at the local Council level for the preparation of the LDP.
- 2.3 It is intended that the LDP is the spatial reflection of the Inclusive Strategic Growth Plan 2032 (SGP), our Community Plan, and that the two should work in tandem towards the same vision for the District and its communities and set the long-term social, economic and environmental objectives for an area.

National and European Obligations

- 2.4 **The EU “Floods Directive” (2007/60/EC)** came into force in November 2007 and aims to establish a framework that contributes to reducing the impact of flooding on communities and the environment. The Floods Directive precipitated **The Water Environment (Floods Directive) Regulations (Northern Ireland) 2009**.
- 2.5 Following its transposition into NI law the Directive required, under articles 4, 6 and 7 respectively, the undertaking of a preliminary flood risk assessment (PFRA), flood hazard and risk mapping, and the preparation of flood risk management plans (FRMP). All three are to be carried out on a cyclical basis (6 year cycles applies).
- 2.6 Flood risk and hazard maps were published under this directive in 2013, and have been updated since. The first PFRA was published in 2011 and the second in 2018 but was revised in 2019. The first FRMPs were produced in 2015. Consultation on a draft timetable for the preparation of the NI FRMP 2021 –

¹ OFMDFM, DOE and DRD were formerly central government departments. OFMDFM is now the Executive Office. DOE and DRD no longer exist but many of their responsibilities now rest with DfI.

2027 closed in June 2019. Further detail on each of these documents can be found in section 3 of this evidence base.

- 2.7 **The Water Framework Directive (2000/060/EC)** established a new system for the protection and improvement of all water environments in the EU to ensure they are managed in a sensible and consistent manner. Each river basin must have a strategic management plan with specific objectives for the water bodies within the river basin, allowing a comprehensive programme of measures to be prepared.

The Draft Programme for Government Framework 2016 – 2021 (dPFG)

- 2.8 The dPFG is a high-level strategic document concerned with setting the overall strategic direction for the region. It identifies 14 outcomes it hopes to achieve in order to fulfill its stated purpose of improving wellbeing for all. Outcome 2: *Living and working sustainably - protecting the environment* relates to impacts on the natural environment that can result from economic growth and social progress and observes that flood mitigation, in the form of natural defences, is one of the services provided by the natural environment and one of the principal reasons it should be protected.
- 2.9 The dPFG sets out the role of the Executive, albeit in broad terms, in contributing to achieving the 14 outcomes identified. The Executive's role includes:
- Protecting the natural and built environment.
 - Reducing the local and global impact of our consumption and production.
 - Working with business to reduce energy and resource intensity.
 - Working with business to minimise its impact on the environment through intelligent regulation.
 - Supporting people to live more sustainably.
 - Working to increase respect for the environment.
- 2.10 The LDP contributes to achieving these outcomes by having regard to the dPFG in the formulation of its Plan Strategy policies.

The Draft Marine Plan for Northern Ireland

- 2.11 The Marine Plan for Northern Ireland is made up of two plans, one for the inshore region under the Marine Act and one for the offshore region under the Marine and Coastal Access Act 2009 (MCAA). The Marine Plan, therefore, combines the plans for both the inshore and offshore regions into one document and will be collectively known as the Marine Plan for Northern Ireland. The Marine Plan contains provisions relating to retained functions². A Marine Spatial

² Retained functions are matters which are not fully devolved to Northern Ireland and these are defined in section 60 in the Marine and Coastal Access Act 2009 (also section 12(1) of the Marine Act (Northern Ireland) 2013) and described more fully in Schedule 3 to the Northern Ireland Act 1998.

Plan for Ireland is also being prepared; when finalised and if relevant, it shall be taken into account for any flooding implications for this District.

- 2.12 The Marine Plan and other marine policy documents³ will inform and guide the regulation, management, use and protection of the Northern Ireland marine area. The Northern Ireland marine area is made up of an inshore and an offshore region, the boundaries of which can be found in the evidence base for Chapter 22 Coastal Development. The Marine Plan will support and complement other existing legislation, policies, plans and strategies.
- 2.13 One of the core policies of the Marine Plan relates to mitigating and adapting to climate change. For the marine and coastal area, the impacts of climate change include a loss of natural flood protection and risks to the natural environment, natural assets, people, communities and buildings. Sea level rise, in particular, and increased storm frequency and severity, is likely to put some parts of the Northern Ireland coast at greater risk of coastal change and flooding
- 2.14 Additionally, the Marine Plan makes provision for impacts on coastal processes i.e. sediment transport, coastal change (erosion and accretion), wave dynamics, current flows and inundation of the land by the sea (coastal flooding). Coastal processes are natural mechanisms that can sustain beaches and maintain healthy ecosystems. Natural features such as beaches, sand dunes and estuaries provide natural mitigation that can reduce the impacts of extreme weather events by providing space for floodwaters.
- 2.15 Natural defences notwithstanding, the Marine Plan highlights that DfI Rivers maintains 26kms of sea defences to protect low-lying coastal lands and infrastructure from flooding.

The Water and Sewerage Services Act (Northern Ireland) 2016

- 2.16 The Water and Sewerage Services Act (Northern Ireland) 2016 requires any person proposing to connect a sewer or a lateral drain to a public sewer to obtain written approval on the basis of a mandatory sewer adoption agreement. This will be subject to conditions relating to quality standards, adoption and security.
- 2.17 Clause 4 of the Act provides a definition of sustainable drainage systems for dealing with surface water from premises and provides the power to adopt specified SuDS structures. It places a requirement for SuDS to be considered and constructed where appropriate and for NI Water to refuse surface water connections to a public sewer.
- 2.18 The approval for surface water run-off from development will be under the responsibility of the watercourse management section of the Department of Infrastructure. With the exception of tidal estuaries and coastal waters, green

³ Marine policy documents include the UK Marine Policy Statement and any Marine Plan produced by a Marine Plan Authority

field run-off should be considered as a normal starting point for design of development surface water drainage systems.

- 2.19 NI Water will accept the design standards based on the CIRIA SuDS Manual C753 published in November 2015. It covers the planning, design, construction and maintenance of Sustainable Drainage Systems (SuDS) to assist with their effective implementation within both new and existing developments.

Sustainable Water – A Long Term Strategy for Northern Ireland

- 2.20 This Strategy presents an overarching approach to help facilitate implementation of a range of initiatives aimed at delivering the long-term vision to have a sustainable water sector in Northern Ireland. The document was published on 25th March 2016 and has been endorsed by the NI Executive. One of the key principles of the document is ‘Principle 4 – Flood Risk Management’. Principle 4 recognises that eliminating flooding is not a realistic objective. The SPPS concurs, advising that it is a natural process which cannot entirely be prevented. It is important, however, that flooding is sustainably managed to help protect social, economic and environmental development.
- 2.21 Part 3 of the document – ‘Flood Risk Management and Drainage’, makes a number of recommendations to be considered when local development plans are being produced. Key aims in the Strategy are:
- Deliver Sustainable Flood Resilient Development
 - Manage the Catchment to Reduce Flood Risk
 - Provide Sustainable Integrated Drainage in Rural and Urban Areas
 - Improve Flood Resistance and Resilience in high Flood Risk Areas
 - Be Prepared for Extreme Weather Events

Regional Planning Policy

- 2.22 The regional policy context is provided by the Regional Development Strategy (RDS) 2035 which presents regional guidance (RG) under three sustainable development themes - economy, society and environment.

This section sets out the policy objectives in relation to flood risk and drainage.

Regional Development Strategy (RDS) 2035

- 2.23 The key policy aims of the RDS 2035 regarding water and sewerage are:
- Policy RG8 of the RDS 2035 emphasises the need for mitigating the risk of flooding by avoiding those areas known to be at risk. This position is reflected in the Housing Evaluation Framework (Table 3.2 of RDS) with the

Environmental Capacity test including assessment of potential flood risk areas to guide the allocation of land for housing growth.

- Encourage sustainable surface water management. This will involve the encouragement of initiatives such as Sustainable Drainage Systems (SuDS) in significant development proposals. SuDS endeavour to use natural systems with low environmental impact (such as trans-evaporation) to dispose of dirty water and surface water in order to reduce the amount of water being released back into watercourses.
 - Policy RG12 of the RDS 2035 promotes a more sustainable approach to the provision of water and sewerage services and flood risk management. Increased population, change in household formation and climate change continue to put pressure on our water resources and drainage systems which may lead to discrepancies in water demand and availability as well as potential impacting on water quality.
 - Policy RG1 of the RDS 2035 states that when allocating land for economic growth and employment, areas which are at risk of flooding should be avoided.
- 2.24 The RDS is complemented by Planning Policy Statements (PPSs) which set out the Department's planning policies for each specific type of development. However, following the transfer of most planning functions to local authorities, including plan-making, and the introduction of the two tier planning system in 2015, these PPSs will eventually be replaced by the adopted plan strategy (PS) of a new council-prepared development plan.
- 2.25 The Strategic Planning Policy Statement (SPPS), published September 2015, outlines the transitional arrangements which apply during this process. It also provides regional policy provisions which support, clarify and, in some instances, update the provisions of the PPSs. The SPPS does not introduce any significant changes to PPS 15 (Revised) Planning and Flood Risk. The position in terms of each of the PPSs and the SPPS are summarised within the relevant subject area below.

Strategic Planning Policy Statement (SPPS)

- 2.26 The SPPS explains the Local Development Plan and Development Management system requirements and consolidates the existing suite of strategic subject planning policies into a single document. In preparing the LDP draft Plan Strategy (dPS), the Council must take account of the SPPS.
- 2.27 The SPPS contains objectives in respect of flood risk as well as setting out regional strategic policy for councils to consider. It also sets out implementation measures for the preparation of LDP's.
- 2.28 Local Development Plan (LDP) preparation must make use of the latest flood risk information produced by the Department for Infrastructure and should work

in collaboration with relevant Departments, adjacent councils and agencies. It must take account of the potential risks from flooding over the plan period and beyond, as this is likely to influence decisions on such matters as the zoning of land for development or the designation of land for open space use. The LDP should also promote sustainable drainage within the plan area.

- 2.29 Derry City and Strabane District Council sets out policies and proposals in the Local Development Plan (LDP) that support the above-mentioned aim and policy objectives, tailored to the local circumstances of the plan area. In doing so, the DCSDC has assessed the likely extent of future flood risk for the plan area.
- 2.30 The aim of the SPPS in relation to flood risk is to prevent future development that may be at risk from flooding or that may increase the risk of flooding elsewhere.
- 2.31 The regional strategic objectives for the management of flood risk are to:
- prevent inappropriate new development in areas known to be at risk of flooding, or that may increase the flood risk elsewhere;
 - that the most up to date information on flood risk is taken into account when determining planning applications and zoning / designating land for development in Local Development Plans (LDPs);

- adopt a precautionary approach to the identification of land for development through the LDP process and the determination of development proposals, in those areas susceptible to flooding where there is a lack of precise information on present day flood risk or future uncertainties associated with flood estimation, climate change predictions and scientific evidence;
- manage development in ways that are appropriate to the four main sources of flood risk in Northern Ireland, i.e. fluvial, coastal, surface water and water impoundment (reservoir) breach or failure;
- seek to protect development that is permitted within flood risk areas by ensuring that adequate and appropriate measures are employed to mitigate and manage the flood risks;
- promote sustainable development through the retention and restoration of natural flood plains and natural watercourses as a form of flood alleviation and an important environmental and social resource;
- promote sustainable development through encouraging the use of sustainable drainage for new development and redevelopment / regeneration schemes;
- promote public awareness of flood risk and the flood risk information that is available and of relevance to undertaking development; and
- promote an integrated and sustainable approach to the management of development and flood risk which contributes to:
 - the safety and well-being of everyone,
 - the prudent and efficient use of economic resources,
 - the conservation and enhancement of biodiversity, and
 - the conservation of archaeology and the built heritage

Existing Planning Policy Statements

- 2.32 **PPS 15 (Revised): Planning and Flood Risk (September 2014)** – Flood risk management is an important aspect of sustainable development as flooding has far reaching and long term implications for society, the economy and the environment. Development plans need to take account of the potential risks from all sources of flooding over the plan period and beyond as this is likely to influence decisions on the zoning of land for various uses. Development Plans should avoid zoning sites for development in flood risk areas. Outside of such areas, it may still be appropriate for the Plan to mitigate against the risk of possible flooding, for example, by requiring susceptible areas within development sites to be retained as open space or indicating where the use of water resistant materials and forms of construction will be considered necessary.
- 2.33 Flood risk may also be an important consideration in the definition of settlement limits and in the designation of new settlements. Development plans may also need to consider the potential implications of flood risks beyond the Plan area.

- 2.34 As part of the precautionary approach, the council may also need to review existing development plans with a view to addressing flood risk issues which have been identified recently as a result of the emerging flood risk information. This may be necessary, for example, where undeveloped land previously zoned for development is now known to be located in a flood plain. In such circumstances and providing the flood risk cannot be properly managed through the development management system, a formal amendment to the Plan may need to be considered.
- 2.35 Local Development Plan Strategies have a role to play in furthering a more sustainable approach to flood management. This includes measures such as:-
- Flood avoidance through the careful selection of housing and economics zonings;
 - identifying flood plains and safeguarding them from development likely to impact upon their flood storage and conveyancing capacity;
 - identifying and safeguarding from development areas of storm exceedance; and
 - promoting sustainable drainage schemes (SuDS).

Existing Area Plans for Derry City and Strabane District

- 2.36 Derry Area Plan 2011: The DAP was adopted in 2000 and has one policy on flooding.
- *Policy PU 2 Areas at Risk from Flooding* - Development will not normally be permitted in areas known to be at serious risk from flooding.
- 2.37 *Strabane Area Plan (SAP) 2001* was adopted in 1991. The SAP has no specific policy on flooding.
- 2.38 SAP stated that surface water run-off from within zoned lands can be accommodated by existing watercourse systems, subject to the approval of points of discharge. In some cases, the downstream improvement of works would be required prior to significant development.
- 2.39 Strabane was affected by major flooding in 1987 and SAP stated that a feasibility report confirmed the need to upgrade flood defences along the River Mourne in order to protect the low-lying areas of Strabane. The recommendation to replace flood defences along the southern boundary of the town centre was carried out during the plan period.

Derry City and Strabane District Community Plan

- 2.40 The Inclusive Strategic Growth Plan – Our Community Plan (CP) was published in final form in November 2017. The new style of LDP provides a unique opportunity for the Council to genuinely shape the district for local communities and enables them to adopt a joined up approach, incorporating linkages to other

functions such as regeneration, local economic development and community planning. The Local Government Act introduces a statutory link between the CP and the LDP, in that the preparation of the LDP must ‘take account of’ the CP – which provides the higher-level strategic aspirations for economic development in the District. The Strategic Growth Plan’s key actions are to prioritise protection from the risk of flooding and promote the use of sustainable drainage systems (SuDS).

- 2.41 It is intended that the LDP is the spatial reflection of the CP and that the two should work in tandem towards the same vision for the Council area and our communities and set the long-term social, economic and environmental objectives for the District.

DC&SDC Climate Adaptation Plan.

- 2.42 The Council is actively working on NI’s first Council-produced Climate Adaptation Plan. It is due to be published in 2020 but the principles and thrust of this emerging plan have been incorporated in this LDP dPS. This plan seeks to identify the key areas of vulnerability and risk for the Council, City and District in relation to current and projected climate change and associated severe weather events. Impacts from future coastal / tidal flooding is a real concern within this District and reducing our carbon footprint through promoting the use of renewable energy developments will help achieve this.
- 2.43 Actions identified in the Adaptation Plan will seek to improve the resilience of Council services, operations and local communities. The ultimate aim is that climate action planning will become normal business - mainstreamed in Council decision making, policy development, service planning and delivery.
- 2.44 Effective Planning, design and decision-making has a central role to play in future proofing the City and District in order to address climate change and improve adaptive capacity and resilience. This includes the consideration of the effects of climate change through land zoning, designations and applications as well as the potential impact of proposals on greenhouse gas emissions and the ability to adapt to a changing climate.

Other Relevant Plans / Documents

The Practical Application of Strategic Planning Policy for ‘Development in Proximity to Reservoirs’ Technical Advice Note (TAN) published by DfI Rivers, August 2018.

- 2.45 This Technical Advice Note is the most up to date advice and sets out how the DfI Rivers applies its responsibilities with regard to the provisions of planning policy contained within the Strategic Planning Policy Statement (SPPS),

together with the provisions of Policy FLD 5 of Planning Policy Statement (PPS) 15 (Revised) “Development in Proximity to Reservoirs”.

- 2.46 Its purpose is to explain the general approach DfI Rivers follows when providing advice to Planning Authorities on all relevant applications for development within the flood inundation area of a controlled reservoir. The advice which DfI Rivers provides to Planning Authorities is, of course, a material consideration, with the relevance and weight to be accorded to it being a matter for the decision taker on a case by case basis.

Technical Flood Risk Guidance in relation to Allowances for Climate Change in Northern Ireland published by DfI Water & Drainage Policy Division, February 2019.

- 2.47 This Department for Infrastructure (DfI) technical flood risk guidance consolidates and where appropriate, updates existing guidance on allowances for Climate Change and is designed to assist engineers and other professionals in their considerations of flood risk. Appropriate consideration of Climate Change in the design of infrastructure ensures its sustainability and future proofs public assets for the management of flood risk.
- 2.48 The guidance also primarily sets out DfI Roads and NI Water’s approaches to Climate Change in design of their respective Road Drainage and Storm Drainage systems. These approaches have been reviewed and there has been no change to existing guidance in these areas.
- 2.49 The guidance also sets out the DfI Rivers approach to Climate Change in Flood Risk Management. The existing approach has been reviewed and updated. A key change involves the approach to hydrological and hydraulic modelling/design which now requires the allowance for Climate Change to be made separately to any additional allowance for freeboard. Previously, guidance recommended ‘testing’ for Climate Change within the freeboard envelope.
- 2.50 This guidance addresses the issue of a suitable future epoch, or time period, on which to base allowances for Climate Change for Development Planning and Flood Risk Management purposes. The 2080s has been agreed as a suitable epoch.

Guidance on the preparation of LDP policies for Flood Risk Management published by DfI Rivers, June 2018. Refer to Appendix 2.

- 2.51 The purpose of this guidance is to assist Councils with the drafting of sound operational planning policies to be included within the Local Development Plan. While it is material to the preparation of Local Development Plans, it is not intended to inform the consideration of planning applications and will therefore have little operational weight. As such, this guidance has not been subject to public consultation or published but has been provided to Councils by DfI in its

capacity as a statutory consultation body in the preparation of the Council's Local Development Plan.

- 2.52 The document provides essential background information and definitions. It also highlights the key considerations that should be taken into account to ensure that robust local operational planning policies are formulated and the reasons why these policy considerations are important. The application of this guidance will be monitored and content will be kept under review.
- 2.53 The guidance recognises that Councils have the flexibility to formulate robust local flood risk management policies that meet their local needs and align with the policy provisions of the SPPS. However, Planning Policy Statement 15 (Revised) 'Planning and Flood Risk' (PPS 15) contains robust flood risk management policies that have been proven to work well since its introduction in 2006. DfI Rivers considers that these policies are seen as exemplar across the United Kingdom and Ireland. These policies are closely replicated (in a strategic way) in the Strategic Planning Policy Statement for Northern Ireland.

Amendment to DfI Rivers 'Guidance on the preparation of LDP polices for Flood Risk Management' (Email from DfI Rivers to Heads of Planning)

- 2.54 'Following the issue in June 2018 of the DfI Rivers 'Guidance on the preparation of LDP polices for Flood Risk Management' further consideration has been given to the policy guidance for development in proximity to controlled reservoirs on (pages 12 and 13 of the guidance).
- 2.55 In relation to development and reservoir flood risk and local Development Plans, the guidance remains valid in general terms and reflects the existing strategic planning policy on 'Development in Proximity to Reservoirs'. However, given the low probability of reservoir failure, where the condition, management and maintenance is assured, going forward a full Flood Risk Assessment (FRA) or other analysis, which considers flow paths and depth & velocity, may not always be required. The need for a FRA or other analysis will be considered by DfI Rivers on a case by case basis and will be dependent on the condition, management and maintenance regime of the relevant reservoir/s.
- 2.56 In the longer term, but subject to Ministerial agreement, it is possible that the strategic planning policy for 'Development in Proximity to Reservoirs' will be reviewed. This review will consider, among other matters, the policy position that applies in the United Kingdom, whereby reservoir condition, management and maintenance , as required by the respective Reservoirs Acts, is the key consideration.
- 2.57 It should also be recognised that once the key elements of the Reservoirs Act (NI) 2015 are commenced and the regulatory regime for controlled reservoirs in place, there will be a period of time before it is fully established. Local Development Plan policies therefore must continue to ensure that the flood risk from controlled reservoirs is appropriately considered for new development.

2.58 The following wording may be useful to include in the LDP policy sections:-

New development will only be permitted within the potential flood inundation area of a “controlled reservoir” as shown on the Strategic Flood Map, if:

- *the applicant can demonstrate that the condition, management and maintenance regime of the reservoir is appropriate to provide sufficient assurance regarding reservoir safety, so as to enable the development to proceed; or*
- *where assurance on the condition, management and maintenance regime of the relevant reservoir/s is not demonstrated, the application is accompanied by a Flood Risk Assessment, or other analysis, which assesses the downstream flood risk in the event of an uncontrolled release of water due to reservoir failure as being acceptable to enable the development to proceed.*

There will also be a presumption against development within the potential flood inundation area for proposals that include:

- *essential infrastructure;*
- *storage of hazardous substances; and*
- *bespoke accommodation for vulnerable groups.*

Replacement Building(s):- Where assurance on the condition, management and maintenance regime of the relevant reservoir/s is not demonstrated, planning approval will be granted for the replacement of an existing building(s) within the potential flood inundation area of a controlled reservoir provided it is demonstrated that there is no material increase in the flood risk to the proposed development or elsewhere.

This approach was discussed at a Heads of Planning Sub Group meeting on the 8th May 2019 and has been agreed with the DfI Regional Planning Division.’

North West Flooding Review 2018 undertaken by DfI, The Executive Office (TEO) and DCSDC, and published in March 2018.

- 2.59 During the evening of the 22nd and morning of the 23rd August 2017, the North West experienced, in a number of locations, what for many were unprecedented levels of rainfall. The result was that the area was subject to widespread flooding, leading to significant disruption to life at both an individual and community level.
- 2.60 This Review gathered evidence from emergency responders, the voluntary sector, government organisations, special interest groups and elected members. A number of sessions were held in the Foyle Arena, so that the Review organisations and independent facilitator could hear at first-hand about the impacts of the flooding, the positive aspects of the multi-agency response

to this emergency and areas that need to be addressed to further enhance emergency response and flood risk management arrangements in the future.

- 2.61 The flooding was as a direct result of very heavy and persistent rainfall in the North West on 22nd and 23rd August 2017. 60-70mm of rain, equivalent to 63% of the average August rainfall, fell in the space of 8-9 hours causing many watercourses to rise, in some areas, to unprecedented levels in a very short period of time.
- 2.62 This caused flooding to approximately 400 homes, numerous businesses and impacted significant areas of agricultural land, particularly at Eglinton, Drumahoe, Clady and in the Sperrins. There was also significant damage to infrastructure with 210 roads either closed or impacted and 89 bridges requiring remedial action as a result of the flooding. Flood defences also suffered widespread impacts with a total of 2900m damaged in numerous locations across the North West.
- 2.63 In general terms, the areas affected by the flooding correlated with predicted flood inundation areas as outlined in the DfI Flood Hazard and Risk Maps that have been developed as a result of the implementation of the EU Floods Directive.

UK Climate Change Risk Assessment 2017 Evidence Report compiled by the Adaptation Sub-Committee of the Committee on Climate Change, January 2017

- 2.64 In compiling this report (CCRA2), the UK Government asked the Adaptation Sub-Committee of the Committee on Climate Change to consider the following question:

“Based on the latest understanding of current, and future, climate risks/opportunities, vulnerability and adaptation, what should the priorities be for the next UK National Adaptation Programme and adaptation programmes of the devolved administrations?”

To answer this question, each of the risks and opportunities identified was assessed in a three-step urgency scoring process:

- What is the current scale of climate-related risk or opportunities, and how much action is already underway?
- What is the potential scale of future risks and opportunities, and to what extent will planned actions or autonomous adaptation address these?
- Would there be benefits from further action being taken in the next five years within each of the four countries of the United Kingdom?

- 2.65 The available evidence was supplemented by four research projects commissioned specifically for CCRA2, funded by the Natural Environment Research Council, Defra, and the Environment Agency:

- Future projections of UK flood risk.
- Updated projections of water availability in the UK.
- An aggregate assessment of climate change impacts on the goods and services provided by the UK's natural assets.
- Developing high-end (High++) climate change scenarios.

2.66 The CCRA2 report contains projections (based on the methodology of the Met Office's UK Climate Projections 09 – UKCP09) which show significantly higher temperatures, levels of rainfall and sea levels for NI and identifies the many implications of the associated increased flood risk, including on the built and natural environments.

2.67 The Report was to feed into an updated NI Climate Change Adaptation Programme, which at the time of publishing was expected in 2019 but it is now unclear when such a programme might come forward. Regional policy, such as the SPPS and that produced by DfI Rivers, has therefore not been able to be informed by this and it is these which have largely set the direction of the District's policy on flooding. The Council will closely monitor this and at the review stage of the plan-making process, the District's LDP policy may be amended, if circumstances have changed.

3.0 Background and Statistical Data Regarding Flooding in the District

- 3.1 Flood risk management in relation to development is an important aspect of Planning, particularly with regard to sustainable development. The far-reaching and long-term implications of flooding for society, the economy and the environment are well known but in summary, floods have the potential to cause fatalities and injury, displacement of people, pollution and health risk, loss of drinking water, damage to buildings and the environment and to severely compromise economic activities.
- 3.2 With the increasingly rapid pace of climate change and its direct and major impact on flooding, the requirement to manage risk is an increasingly important element of plan-making, in respect of both strategic policy and the local policies plan (LPP), where specific land will be zoned for a specific purpose. This section provides detail on the data used to help inform the Council's strategic policy, i.e. flood mapping, Flood Risk Assessments (FRAs) and Flood Risk Management Plans (FRMPs), all by DfI Rivers. The DfI Rivers strategic flood maps (now updated to take account of the most up to date climate change data) show the areas of flooding hazard across the region and include data for rivers, the sea, surface water and reservoirs. They also show the areas of potential significant flood risk and transitional areas of potential significant flood risk identified by the NI Flood Risk Assessment 2018 (NIFRA). The North Western Flood Risk Management Plan 2015 (NWFRMP) describes how these areas will be managed.
- 3.3 DfI Rivers published the NWFRMP in December 2015 and the Council has ensured that the LDP is compatible with this FRMP in relation to the specific advice for Derry and Strabane District, in that the flood risk strategy precludes inappropriate development within areas of flood risk and areas that may increase flooding elsewhere. The requirement for the FRMP is cyclical and therefore compatibility will be required until such time as the second cycle FRMP comes forward.
- 3.4 The NWFRMP is based on the **North Western River Basin District** (see Figure 1 below). The North Western River Basin District covers an area of around 4,900 km². It takes in large parts of County Fermanagh, County Derry and County Tyrone.

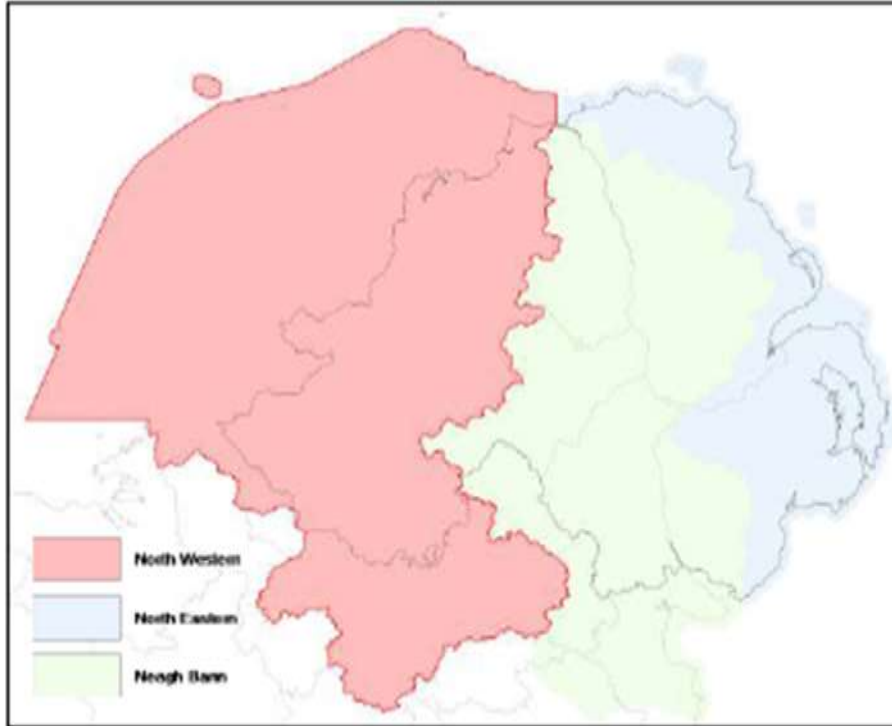


Figure 1 North Western River Basin - NWFRMP 2015

3.5 Twenty areas of significant flood risk (SFRA) were identified within Northern Ireland in the Preliminary Flood Risk Assessment 2011 (PFRA), carried out by Rivers Agency. The NIFRA 2018 reduces this number, identifying twelve areas of potential significant flood risk (APSFR), as they are now termed. However, a further nine areas were determined to be transitional areas of potential significant flood risk (TAPSFR), including Strabane. These TAPSFRs were identified as SFRAs in the 2011 risk assessment but are not currently considered APSFRs due to an improved methodology for assessing flood risk which takes account of existing flood defences and culverts and places greater emphasis on pluvial flooding, amongst other data inputs not used previously. Two APSFRs and one TAPSFR are located in the North Western River Basin District and named as follows:-

- Londonderry APSFR
- Strabane TAPSFR
- Omagh APSFR

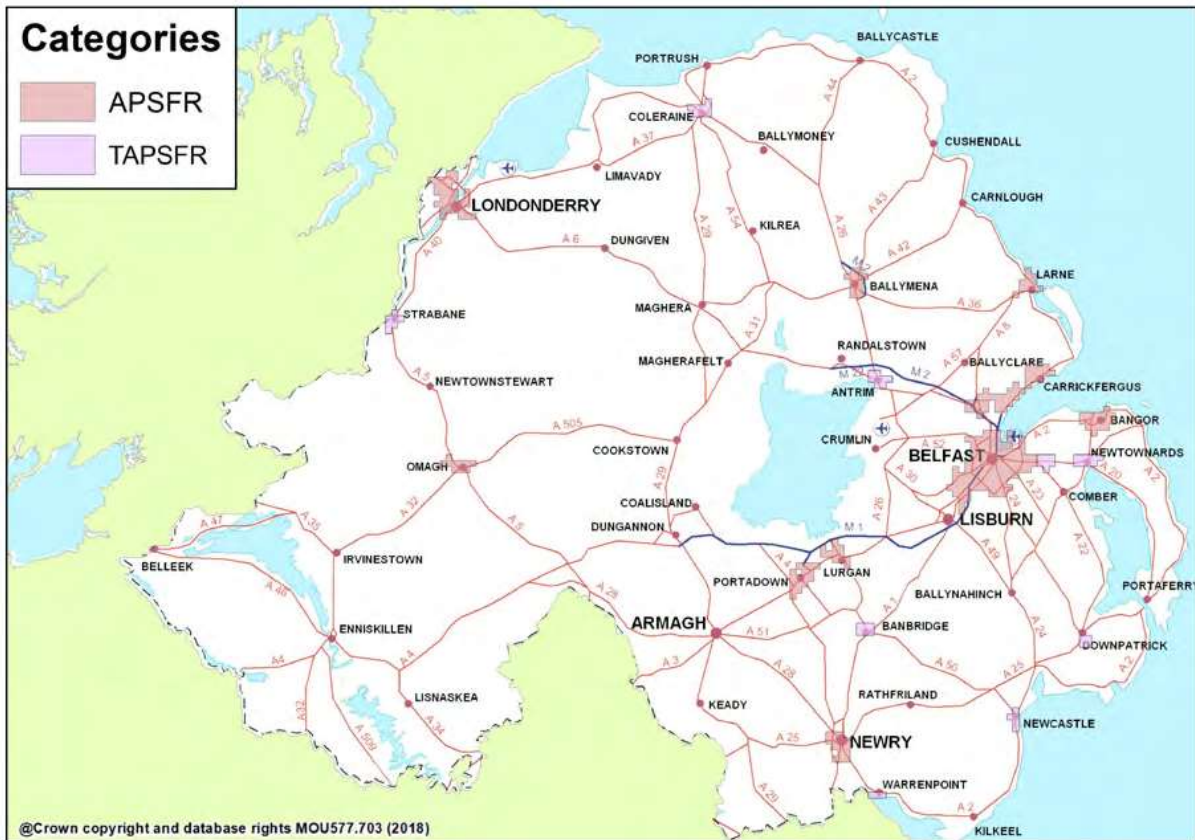


Figure 2 Northern Ireland APSFR and TAPSFR Location Map – NIFRA 2018

The key information regarding the Londonderry APSFR and the Strabane TAPSFR is summarised in the following pages, because of their important potential impact on land uses in the LDP.

Londonderry Area of Potential Significant Flood Risk – River Foyle and River Faughan LMAs

3.6 The core boundary of the Londonderry APSFR, was first determined through the PFRA 2011 and amended in the NIFRA 2018. The APSFR is located within River Foyle and River Faughan Local Management Areas (LMAs) as illustrated in Figure 2 below. Please note, the APSFR boundary in Figure 3 has been amended as per Figure 4.

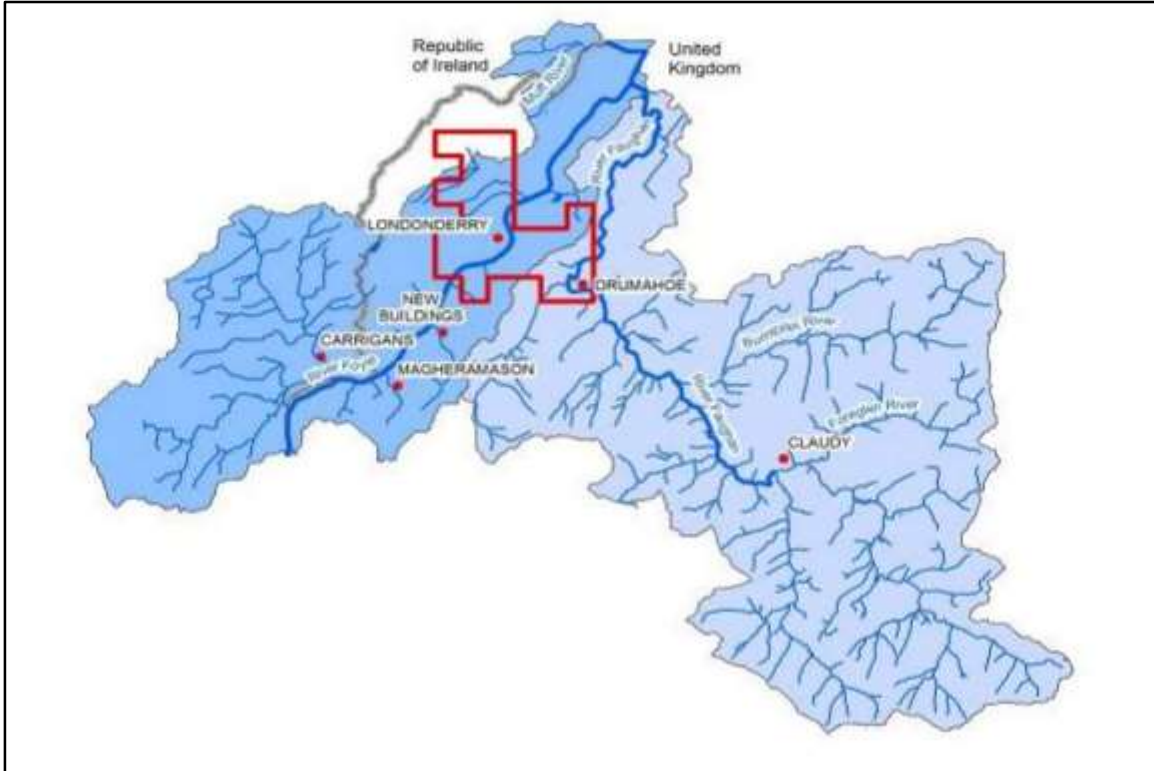


Figure 3 Former Londonderry APSFR and current LMAs – North Western River Basin Flood Risk Management Plan

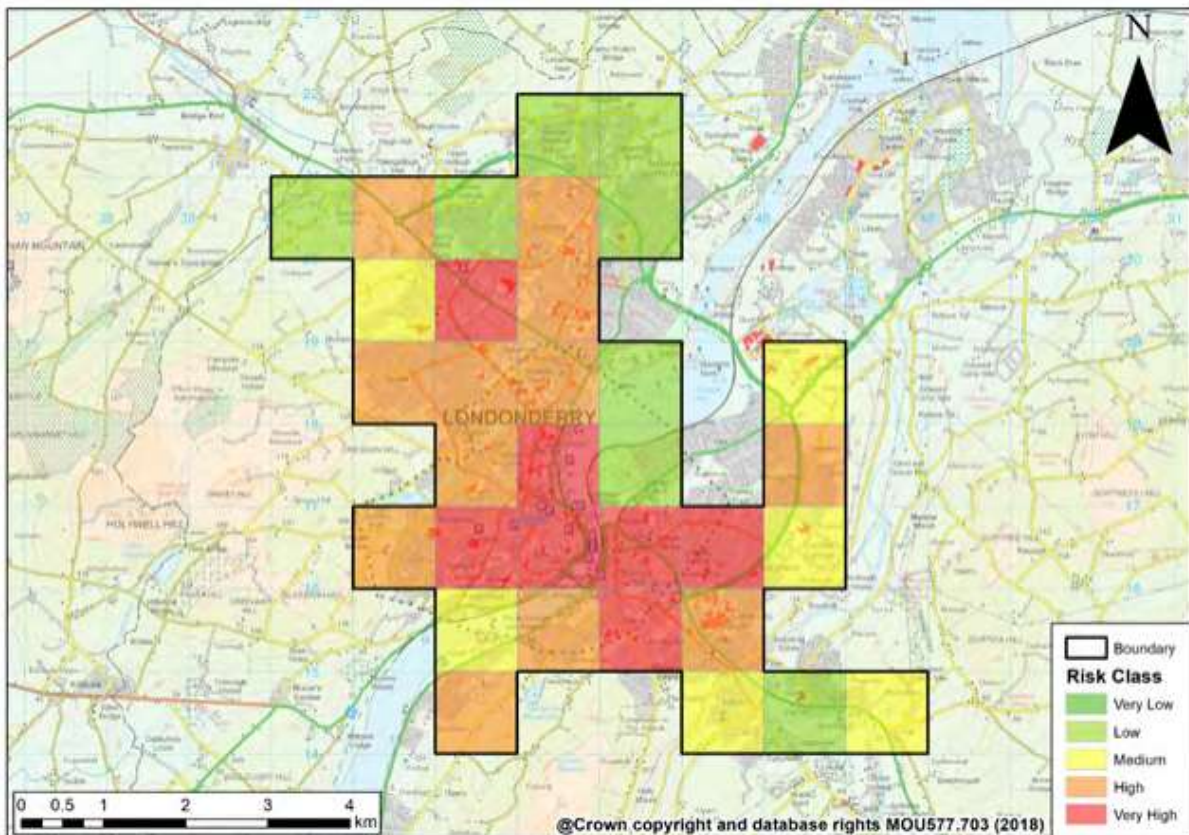


Figure 4 Revised Londonderry APSFR – NIFRA 2018

- 3.7 The Foyle System is located primarily in Northern Ireland and accounts for a significant portion of the region west of Lough Neagh. There are a large number of tributaries and some of the headwaters are located in the Republic of Ireland / Donegal.
- 3.8 The Foyle study area includes three smaller watercourses which drain the coastal land to the east of Derry, all of which discharge to the tidal Lough Foyle. None of these are hydraulically linked with the Foyle catchment. The most easterly of these is the River Roe, flowing through the towns of Dungiven and Limavady. Muff River drains a much smaller catchment (29 km²), flowing through Eglinton. To the west is the River Faughan, a larger system draining 296 km² of land around Claudy and Drumahoe.
- 3.9 The NWFRMP identifies both coastal and pluvial flood (floods due to rainfall) risk models for the Derry area. The coastal models centre on impacts on the city and takes into account key infrastructure such as Coolkeeragh Power Station. The fluvial models (floods due to rivers overflowing) identify key areas on the east and west banks of the Foyle. The models illustrate the predicted extents and depths from potential flooding and detail the impact of flooding on property and key infrastructure.
- 3.10 The fluvial areas identified on the west bank of the Foyle are as follows: Pennyburn Stream and Creggan Burn. The areas identified on the east bank of the Foyle are Woodburn Park Stream, Burngibbagh and Ardnabrocky Drain.
- 3.11 In the preparation of new development plans for the City, DfI Rivers advises against bringing forward sites or the zoning of any land, particularly for built development that has been identified from the flood maps as being within the 1 in 100 year fluvial floodplain / 1 in 200 year coastal floodplain/reservoir inundation area or is susceptible elsewhere to surface water flooding. It was the position of Rivers Agency in 2015, as stated in the NWFRMP, that they intended to review the existing development plan for Derry with a view to addressing flood risk issues which had only recently been identified as a result of then new flood maps. To date, no further information on this has been returned to the Council. The main (undeveloped) flooded areas, amongst others, within the Londonderry APSFR are:

- Areas within the floodplain of the River Faughan – for example near Ardlough Road.

Flood maps can be viewed at the following link:

<https://www.infrastructure-ni.gov.uk/topics/rivers-and-flooding/flood-maps-ni>

3.12 *Areas at Risk of Surface Water Flooding*

For those sites outside the 1 in 100 year AEP fluvial floodplain/1 in 200 year coastal floodplain or that are located in an area where there is evidence of a history of surface water flooding, DfI Rivers will further consider a planning application through the appraisal of an accompanying Drainage Assessment

that will need to demonstrate suitable flood mitigation measures. Where there is potential for surface water flooding, as indicated in purple on the flood maps, DfI Rivers will advise that the applicant should assess the flood risk and drainage impact to the site and construct in an appropriate manner. The main areas identified in the City as being at surface water flood risk are:-

- The low-lying areas behind the quays on the west bank of the Foyle – for example, Foyle Street, Strand Road and Rossville Street.

3.13 Areas at Risk of Flood Inundation from Reservoirs

For all development proposals that are located within the potential flood inundation area of a controlled reservoir, DfI Rivers will further consider an application where it can be demonstrated that the condition, management and maintenance regime of the reservoir is appropriate to provide sufficient assurance regarding reservoir safety or through the appraisal of the accompanying flood risk assessment (FRA) or other analysis. The FRA must demonstrate suitable flood mitigation measures. For replacement buildings, where assurance on the condition, management and maintenance regime is not demonstrated, it will be necessary to demonstrate that there is no material increase in the flood risk to the proposed development or elsewhere. There are 14 controlled reservoirs identified in the Derry area:-

Reservoir Name	Ownership
Creggan lower	3 rd sector
Creggan Upper	3 rd sector
Upper Creggan Upper	3 rd sector
Carmony 1 service reservoir	Public
Carmony 2 service reservoir	Public
Carmony 3 service reservoir	Public
Carmony 4 service reservoir	Public
Corrody south service reservoir	Public
Creggan Blighs lane 1 reservoir	Public
Creggan Blighs lane 2 reservoir	Public
Creggan foot bridge service reservoir	Public
Croppy Hill 1 Service reservoir	Public
Killea reservoir / Crevagh Hill Lake	Public
Tullywhisker east 1 service reservoir	Public

Table 1 Controlled Reservoirs within Derry Area

3.14 Potential Schemes in Derry APSFR

Coastal

Given the coastal damages calculated, the NWFRMP proposes that the City is considered for a Flood Alleviation Scheme and states that it should be prioritised for the DfI Rivers Works Study Programme.

Fluvial

Given the fluvial damages calculated, the NWFRMP also proposes that the following watercourses are considered for Flood Alleviation Schemes and prioritised for the DfI Rivers Works Study Programme:-

- Ardnabrocky Drain;
- Burngibbagh;
- Woodburn Park Stream; and
- Pennyburn Stream.

Strabane Transitional Area of Potential Significant Flood Risk – Finn, Deele, Burndennet and Foyle LMA

3.15 In the PFRA 2011, Strabane was considered to contain an SFRA however under the NIFRA 2018 review this is now a TAPFR, the boundary of which has been amended from that of the SFRA, shown in Figure 5 below within the context of the Finn, Deele, Burndennet and Foyle Local Management Areas (LMAs). Figure 6 shows the boundary as it is now as a TAPFR.

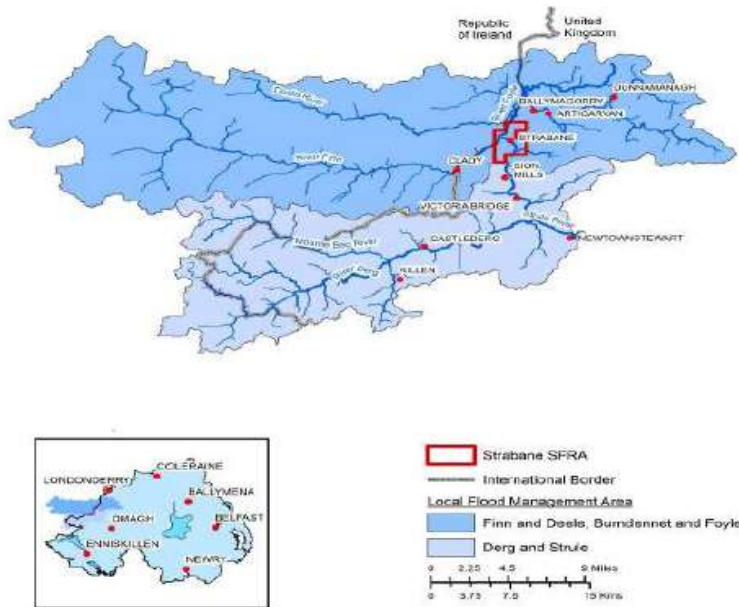


Figure 5 Former Strabane APSFR and current LMAs – North Western River Basin Flood Risk Management Plan

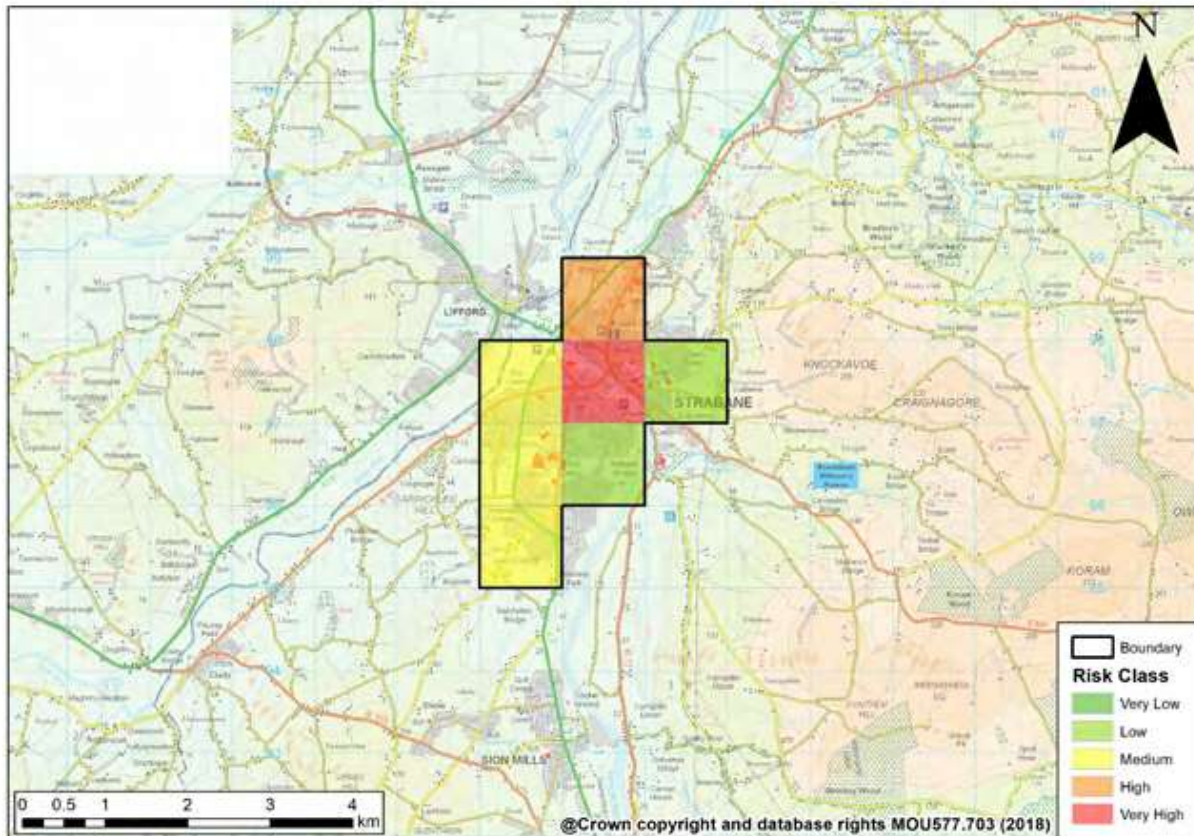


Figure 6 Strabane TAPSFR – NIFRA 2018

- 3.16 Strabane is at the confluence of the River Mourne and the River Finn. Downstream from the confluence is the River Foyle. The Burndennet River flows west and joins the River Foyle some distance downstream of the Strabane TAPSFR. Both the Finn River and Deelee River flow east from Donegal. The Deelee River joins the River Foyle downstream of the Strabane TAPSFR. The catchments are mainly rural with Omagh and Strabane being the only significant urban areas. There is a history of significant flooding the urban area of Strabane. After floods in 1987, flood defences were improved along the southern edge of the town centre. DfI Rivers records show that the improved walls have withstood all the flood flows to date. In recent years, DfI Rivers has dealt with isolated drainage problems many of which related to surface water. In order to address specific drainage issues, DfI Rivers carried out major culvert replacement works on Nancy Burn in the 1990s.
- 3.17 The NWFRMP identifies 3 models of potential flood risk areas in the Strabane area. These are locations are at Urney Road/Glenfinn Park Area, Park Road Drain/Lifford Road and Roundhill.
- 3.18 In the NWFRMP, in relation to the preparation of new development plans for Strabane, DfI Rivers advises against bringing forward sites or the zoning of any land, particularly for built development, that has been identified from the flood maps as being within the 1 in 100 year fluvial floodplain or is susceptible

elsewhere to surface water flooding. It was the position of Rivers Agency in 2015, as stated in the NWFRMP, that they intended to review the existing development plan for Strabane with a view to addressing flood risk issues which had only recently been identified as a result of then new flood maps. To date, no further information on this has been returned to the Council. The NWFRMP advises that the main (undeveloped) flooded areas, amongst others, within the Strabane TAPSFR are:-

Areas behind river flood embankments – for example, between the River Foyle and the Barnhill Road/Derry Road and between the River Finn/Mourne River and the Great Northern Link.

3.19 *Areas at Risk of Surface Water Flooding*

For those sites outside the 1 in 100 year fluvial floodplain that are located in an area where there is evidence of a history of surface water flooding (identified by flood hardship payments), DfI Rivers will further consider a planning application through the appraisal of an accompanying Drainage Assessment that will need to demonstrate suitable flood mitigation measures. Where there is potential for surface water flooding, as indicated in purple on the flood maps, DfI Rivers will advise that the applicant should assess the flood risk and drainage impact to the site and construct in an appropriate manner.

The main areas identified in Strabane as being at surface water flood risk are behind the flood defences.

3.20 *Areas at Risk of Flood Inundation from Reservoirs*

For all development proposals that are located within the potential flood inundation area of a controlled reservoir, DfI Rivers will further consider a planning application through the appraisal of the accompanying Flood Risk Assessment, or other analysis, that will need to demonstrate suitable flood mitigation measures. If it is a new development proposal, DfI Rivers will also need the applicant to demonstrate that the condition, management and maintenance regime of the reservoir is appropriate to provide sufficient assurance regarding reservoir safety. There is one controlled reservoir identified in the Strabane area.

3.21 *Potential Schemes in Strabane SFRA*

Given the fluvial damages calculated it is proposed that the following watercourses are considered for Flood Alleviation Schemes and they are prioritised for the DfI Rivers Works Study Programme:-

- Urney Road/Glenfinn Park (undesignated watercourse);
- Urney Road Drain and Urney Road Drain Extension;
- Park Road Drain; and
- Roundhill Drain.

3.22 The North Western Flood Risk Management Plan identifies a number of locations within the District which will be considered as areas of further study.

These include Ballymagorry, Castlederg, Coolkeeragh, Eglinton, Newbuildings, Newtownstewart and Sion Mills. Please see Figure 7 for location of areas of further study.

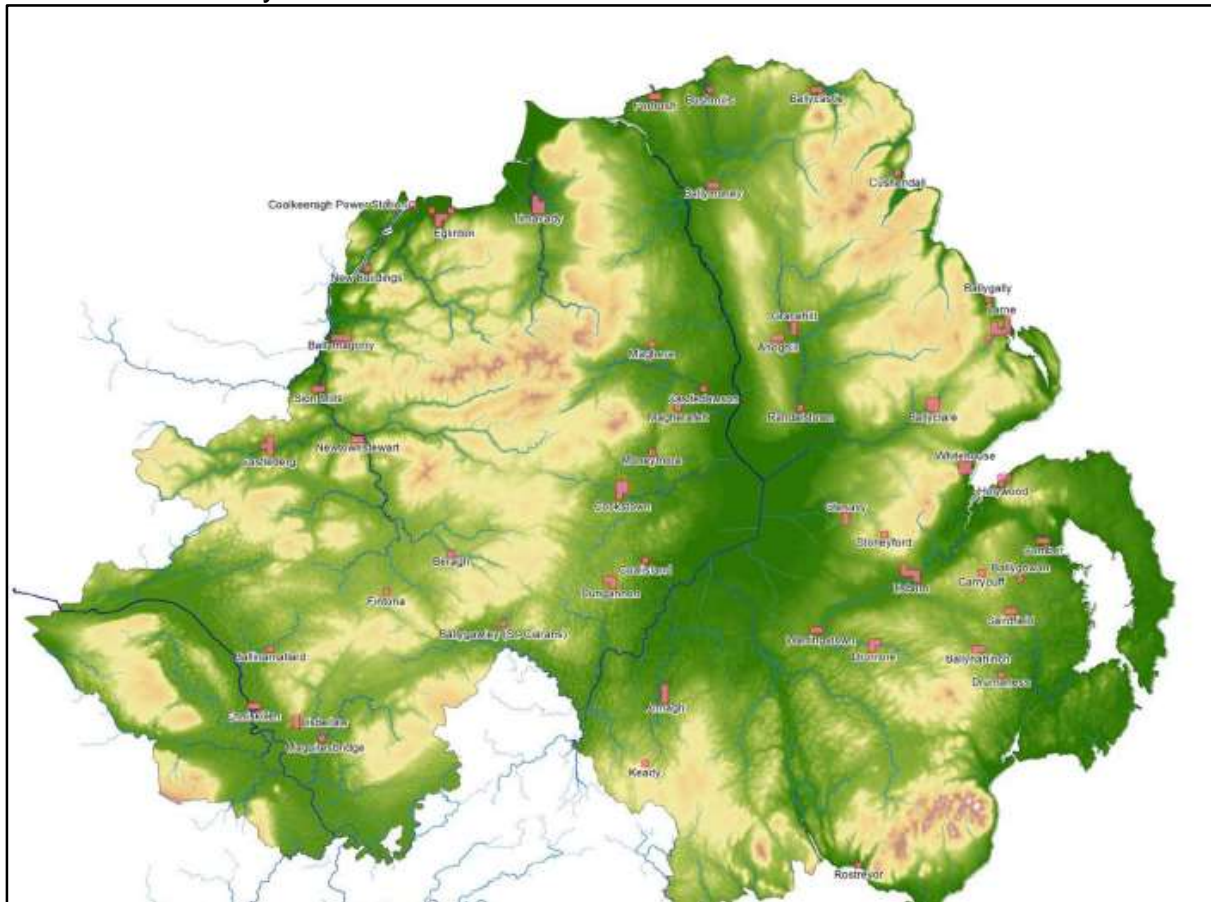


Figure 7 Areas of Further Study – NWFRMP 2015

4.0 LDP Preferred Options Paper Stage

4.1 The research findings contained in an earlier EVB paper together with Members views and advice from the relevant parties / consultees informed the options put forward in the LDP Preferred Options Paper (POP). They were subjected to an initial Sustainability Appraisal (incorporating Strategic Environmental Assessment) as part of the POP process. The LDP POP put forward two options for the proposed Development and Flooding policy, with option 2 as the preferred option.

Option 1	Option 2
Avoid all further development in flood prone areas, or those forms of development which exacerbate flooding elsewhere	Precautionary approach - only allow suitable types of development in flood prone areas in line with SPPS / PPS and with appropriate mitigation

4.2 Following publication of the POP, seventeen representations (responses) were received relating to the proposed options for the flooding policy. A number of representations supported option 1, suggesting it was the ‘true’ precautionary approach. Several respondents also identified SuDS (either as an element of open space provision or otherwise) as a method of managing flooding and called for it to be promoted as a desirable measure within proposed policy. The prioritising of land to create woodland as a mitigation measure for flooding was also suggested.

4.3 DfI Rivers, as the competent authority, were consulted when considering the POP options and it stated a strong preference for the proposed policy to carry forward the provisions and requirements of the existing policy contained in PPS 15 and the SPPS (reflected in the preferred option). It cited the technical complexity of existing policy and considered that option 1 is practically unachievable in that it would not allow for essential or strategic development.

4.4 Given the level of support for option 1, it was agreed to review the exceptions available under current policy, in conjunction with key consultees, to ascertain if there was scope for strengthening the policy through the removal of some exceptions while still maintaining those absolutely necessary. The suggested mitigation measures (SuDS and woodland creation) were also to be considered further in conjunction with key consultees.

4.5 The preferred option therefore remained unchanged at this stage. The subsequent consideration of the above points is detailed under the Draft Plan Strategy Stage of this paper.

5.0 LDP Key Considerations

- 5.1 The key considerations in relation to flood risk are as follows:
- climate change
 - sustainable drainage
 - development along or near watercourses / the coast
 - heightened local awareness
- 5.2 While some areas of the District are already susceptible to intermittent flooding from various sources, principally from rivers, the sea or surface water run-off. It is recognised that climate change will increase the risk of flooding, as well as leading to changes in the frequency, intensity, spatial extent, duration, and timing of extreme weather and climate events. Such extreme weather events lead to disruption to business, agriculture, services and daily life.
- 5.3 The four main sources of flooding are fluvial (river), coastal, pluvial (surface water) and water impoundment (reservoir) breach or failure. There is the potential for occurrences of all four sources within/adjoining the District and recent events in the District such as the flooding of August 2017 have raised local awareness of this considerably.
- 5.4 Moreover, much of the development of our city, towns and other settlements, having evolved over a long time, is located on or close to a river or the coast. The probability of such developments being affected by flooding has increased due to their proximity to the river / coast and the ever increasing need to manage surface water and to supply water to growing populations. Further development within our settlements and, in particular, on land susceptible to flooding must be managed in the future so as to reduce the risks and impacts of flooding.
- 5.5 To that end, the use of sustainable drainage systems (SuDS) requires serious consideration as suitably capable drainage systems are one of the fundamentals in the management of flood risk. Flood defences also play an important preventative role.
- 5.6 DfI Rivers is responsible for dealing with flood risk and advises on the implications of development proposals on drainage and flood defense issues.
- 5.7 Northern Ireland Water (NIW) is also responsible for the provision and maintenance of facilities for draining and depositing of surface water and runoff from roofs and any paved ground surface within the curtilage of premises. However, the service is only provided if it is within reasonable cost, in accordance with the Water and Sewerage Services (NI) Order 2006.
- 5.8 NIW considers that the provision of storm sewerage to new developments can be a problem area. They feel that if a site cannot be drained to a suitable watercourse because of its topography, or if the area is associated with a floodplain, then these areas should not be zoned for development.

- 5.9 DfI Rivers as the statutory drainage and flood protection authority will be consulted in relation to proposals that are likely to involve significant runoff that may affect watercourses and floodplains, or alteration of watercourses.
- 5.10 Currently, drainage improvements necessary to permit development are subject to strict ‘cost/benefit’ criteria and scheme prioritisation. While drainage works to facilitate development may be identified as viable in principle, their implementation is dependent on the availability of resources. This situation may apply to sites proposed for housing in the LDP. DfI Rivers does not seek developer contributions for drainage infrastructure upgrades to facilitate development. PPS 15 FLD 3 details the criteria for provision of a drainage assessment. The purpose of a drainage assessment is to demonstrate that any increase in storm water run-off can be safely disposed of without increasing flood risk to the proposed development or elsewhere.
- 5.11 For those sites where necessary infrastructure improvements are not viable, DfI Rivers will not normally consent to additional run-off beyond existing flow rates. Alternatively, SuDs can, in the right circumstances, offer developers the opportunity to proceed with developments which would otherwise be refused because of the increased flood risk they would pose. SuDs provides options for draining an area and falls into three broad groups that aim to:
- Reduce the quantity of run off from the site (source control techniques);
 - Slow the velocity of run-off to allow settlement filtering and infiltration (permanent conveyance systems); and,
 - Provide passive treatment to collected surface water before discharging into land or to a watercourse (end of pipe systems)
- 5.12 Local streams have a limited ability to accept increased rates of storm water run-off from areas of new development. In some circumstances, improvement works may be necessary. Such improvement works if viable, are dependent upon other competing priorities within DfI Rivers and this may be a factor in the timing of development in some circumstances. DfI Rivers does not carry out infrastructure upgrades to facilitate development
- 5.13 DfI Rivers undertakes maintenance for all “designated” watercourses and a 5-metre wide access strip should be retained free from all permanent structures along at least one riverbank. Accordingly, the LDP should not propose development where it would necessitate the loss of access to a watercourse for future maintenance.
- 5.16 The Plan seeks to promote a move to SuDS and, in large developments where there will be significant runoff, this must be taken into account.

6.0 Draft Plan Strategy Stage

- 6.1 Following on from the POP stage a number of further consultations were carried out with DfI Rivers, DAERA Water Management Unit & Natural Environment Division, Loughs Agency and the Council's Climate Change Officer.
- 6.2 DfI Rivers, the competent authority in the management of flood risk in NI, in their consultation response to the LDP Team has advised that PPS 15 contains flood risk management policies that have been proven to work if applied robustly. DfI Rivers advised the Council to retain the policies in PPS 15 without alteration, as small changes to the wording of policies have potential to have a significant adverse impact on the management of flood risk.
- 6.3 Loughs Agency have advised that they are in support of Option 1, a general avoidance of all further development on the floodplain, and development which exacerbates flooding elsewhere. This is a sensitive issue in our District, given the flooding event of August 2017 and they fully endorse a catchment-based approach to managing the risk from flooding – which would extend to the re-forestation of our uplands and restoration of wetlands. Such measures are aimed at maintaining natural flow regimes and water levels, leading to improving floodwater storage and therefore, flood control. In relation to PPS15, Loughs Agency believe it could be enhanced by extending it to cover some of the wider catchment management issues and measures, as well as the promotion of sustainable drainage systems (SuDS) in all new urban developments throughout the Plan area.
- 6.4 The response from the Climate officer of DCSDC suggests the importance of addressing flood risk at an early stage and from all potential sources. They have advised that increases in winter rainfall, the likely rise in the frequency of extreme weather events and rising sea levels, means that climate change will increase the risks of flooding to development in the City and District. They prefer use of SuDS that involve a range of techniques, uncover / restoration of streams – 'Daylighting' and use of flood risk assessments are essential.
- 6.5 DAERA – Natural Environment Division (NED) have emphasised the importance of retaining the non-culverting policy in full to ensure limited use of culverts on development sites as they fragment river corridors which significantly impacts on species within river systems. Rivers are a priority habitat due to their importance to biodiversity.
- 6.6 Response from DAERA – Water Management Unit emphasises that SuDS should be an integral part of the LDP.

- 6.7 In liaison with Development Management colleagues, it was agreed that there is general conformity between the SPPS and policies within PPS 15. It was considered that the policies within PPS 15 currently work well, is technically sound and the thrust and policy wording of this policy should be retained including the justification and amplification. Policy FLD 5 should be retained and that further advice has been received in the form of the Technical Advice Note from DfI. However, there may be need for some further consideration on the application of the policy, especially as there are potentially significant issues for Derry city centre arising from the reservoir policy.
- 6.8 In addition to the formal consultation exercise, a series of ‘round table discussion’ (RTD) meetings were held in 2018. A number of issues were raised by Members at the RTDs. The main concern was that there should be no development within a flood plain and the Council should be ensuring that developments do not experience a repeat of the 2017 flood event, taking account of updated flood maps and climate change. The following points were also made:
1. The flooding policy should be as robust as possible to ensure the citizens of the District are protected from flooding.
 2. Members would like the possibility of dezoning land at risk of flooding.
 3. Members emphasised that the August 2017 flood event was catastrophic and life changing & still has implications for people today including people unable to get household insurance and unable to sell their homes. The 1 in 100-year flood event is a probability rather than a factual reality. Also, climate change may result in flooding becoming a more frequent occurrence, as previously low risk areas become higher risk areas.
 4. Members raised issues about committed developments, where there is a possibility of flooding on site after planning permission was granted but before the development has commenced and / or been occupied.
 5. There should be more infrastructure in place to prevent rivers bursting their banks. Farmers could previously take gravel out of the river, which is now prevented, resulting in the riverbed being higher than it used to be. This has implications for flooding as there is less capacity within the rivers.
 6. Members also mentioned instances where people had put in smaller pipes / drainage than approved which resulted in flooding at their site but then blamed ‘government’ for the site flooding.
- 6.9 Overall, there appeared to be general agreement by Members on the following:

1. There should be no development within a flood plain and the Council should be ensuring that developments do not experience a repeat of the 2017 flood event taking account of updated flood maps and climate change.
 2. The possibility should be considered of reducing the 5-year time limit for commencement of development when there is a sound reason for doing so e.g. information from Rivers that the flood map in the area would be updated.
- 6.10 A series of Member Discussion Meetings (MDMs) were held in the first half of 2019 to gain member input on a draft of the PS policy wherein Members raised the following additional points:
1. A need to reflect the requirement for cross-boundary consultation and consideration of flooding, especially cross-border.
 2. The applicability of the 1,000sqm threshold in existing Policy FLD 3 to cumulative development
 3. Regarding Compensatory measures and if the Barr Gregg Judicial Review ruling has implications for the Flooding policy.

Regarding, Point 3, the judicial review ruling was reviewed but it is not considered to have general implications which would affect flooding policy.

- 6.12 A further consultation exercise was undertaken with key consultees, in June 2019, to garner their views on the most recent draft of the PS policy. The respective consultees commented:

DCSDC CLIMATE Project Officer:

1. Highlighted the need for annual exceedance probabilities (AEP) to take account of an additional climate change allowance;
2. Suggested references to cross boundary considerations include overt mention of Fermanagh & Omagh as is the case for Donegal;
3. The appropriate height for flood defences should include an additional freeboard allowance for climate change
4. The SuDS information contained in the annex should state a preference for Green Infrastructure/nature based solutions

Points 1 and 2 have been addressed accordingly and separate technical guidance for flood risk indicates a freeboard of up to 600mm should be considered separately to allowances for climate change. Regarding point 4, this annex is being carried over from PPS 15 (Revised) Planning and Flood Risk as supplementary guidance and will be reviewed when possible.

DCSDC Biodiversity Officer

1. Suggested including reference to hydraulic capacity throughout the chapter and its impact on surface water flooding;
2. Cautioned against identifying climate change as the principal factor in flooding and advises, while it certainly impacts on all types flooding, pluvial flooding due to hard surface run off and inadequate hydraulic capacity of the sewage network is the main risk
3. Suggested cross referencing with housing and open space chapters
4. Suggested multiple references to green infrastructure throughout the chapter where reference is made to mitigation
5. Suggested reference to waste material should be included under pollution
6. Suggested reference to no loss of priority habitat along the floodplain

Points in relation to additional referencing have been addressed through including this throughout the chapter where appropriate. Regarding climate change, the chapter is heavily but not primarily concerned with this.

DfI Rivers

1. Put forward amended policy wording in relation to AEPs to account for most up to date climate change data
2. Highlighted need for Part A of Annex A to reflect up to date climate change data

The policy wording has been amended accordingly and the part of the annex referring to climate change data has been omitted in favour of including more current data in this evidence base as an appendix.

DAERA

1. Noted lack of specific policy for SuDS but is content with related guidance set down in Annex A part C
2. Highlighted out of date climate change data/risk assessment references

Policy GDPOL1 makes specific provision for SuDS. The part of the annex referring to climate change data has been omitted in favour of including more current data in this evidence base as an appendix.

DAERA Marine Division (including Marine Conservation & Reporting)

1. Commented that referencing and consideration of marine legislation and policy documents is insufficient. There should be greater recognition of

- the interaction and integration between the marine and terrestrial planning systems
2. Welcome policy to avoid development in areas at risk from coastal erosion
 - The link between terrestrial and marine planning should be explained within the chapter

While Chapter 25: Flooding and Development does reference marine legislation and other marine documents, Chapter 22: Coastal Development provides fuller detail of relevant marine legislation and policy documents and specifically sets out the overlapping marine / terrestrial legislation / policy.

Inclusive Strategic Growth Plan 2017-2032

- 6.13 In respect of the provisions of the Council's Inclusive Strategic Growth Plan 2032 (SGP), under Outcomes and Actions: Environment and Regeneration the prioritisation of water investment, the promotion of SuDS and protection and protection from the risk of flooding are identified as key actions. The SGP, like the proposed Development and Flooding chapter, recognises the impact across all thematic pillars – Economic, Environmental and Social, that flooding can have. Both the SGP and the Development and Flooding chapter require a sustainable approach to flood risk management.

Resultant Flooding Content in the LDP Draft Plan Strategy

- 6.14 The Council's LDP Strategy for Development and Flooding is to have a precautionary approach to development within flood-prone areas. Our policy approach will be to avoid inappropriate development within areas of flood risk and areas that may increase flooding elsewhere, protect our key assets from risk of flooding and to minimise and manage the risk of flooding. The LDP will be in line with regional policy whereby only suitable types of development will be permitted across our District, to align with the Strategic Growth Plan and the Council's emerging Climate Change Adaptation Plan.
- 6.15 There has been a strategic assessment of the flooding potential of existing land zoned for economic and housing development, as well as any potential new zonings. A Stage 1 Land Evaluation Framework for zoned and existing economic land and a Land Availability Assessment for zoned housing in Derry City and Strabane Town were carried out. In addition, a Stage 2 Assessment of settlements which identified a number of constraints, including flooding, was undertaken. At LPP stage, any new zonings will avoid floodable areas.

Policy FLD 1 - Development in Fluvial (River) and Coastal Flood Plains

- 6.16 It is considered that the proposed policy FLD 1 closely reflects the policy direction as set out in the SPPS. The wording of FLD 1 also follows that of *FLD 1* of the previous operating policy under PPS 15 as per DfI Advice to retain the policies of PPS 15 without alteration but now also makes reference to climate change allowance, on the advice of DfI Rivers. Policy PU2 of the DAP 2011 has been subsumed within this policy FLD1.

Policy FLD 2 - Protection of Flood Defence and Drainage Infrastructure

- 6.17 It is considered that the proposed policy FLD 2 closely reflects the policy direction as set out in the SPPS. The wording of FLD 2 is the same as that of *FLD 2* of the previous operating policy under PPS 15 as per DfI Advice to retain the policies of PPS 15 without alteration.

Policy FLD 3 - Development and Surface Water (Pluvial) Flood Risk Outside Flood Plains

- 6.18 The proposed policy FLD 3 closely reflects the policy direction as set out in the SPPS. The wording of the policy of FLD 3 is largely the same as that of *FLD 3* of the previous operating policy under PPS 15, as per DfI Advice to retain the policies of PPS 15 without alteration. However, it is also strengthened to clarify inclusion of ‘phased development’ and ‘cumulative development’ in the requirement for a Drainage Assessment, and within its consideration. This addresses an issue raised by Members and Development Management Planning Officers. The J&A has also been amended to refer to Consent to Discharge and the requirement to demonstrate how surface water will be managed prior to granting of same.

Policy FLD 4 - Artificial Modification of Watercourses

- 6.19 The proposed policy FLD 4 closely reflects the policy direction as set out in the SPPS. The wording of FLD 4 is the same as that of *FLD 4* of the previous operating policy under PPS 15 as per DfI Advice to retain the policies of PPS 15 without alteration.

Policy FLD 5 - Development in Proximity to Controlled Reservoirs

- 6.20 The proposed policy FLD 5 closely reflects the policy direction as set out in the SPPS. The wording of FLD 5 is very similar to that of *FLD 5* of the previous operating policy under PPS 15, as per DfI Advice to retain the policies of PPS 15. Like FLD 3, there was some altering of the wording as DfI Rivers has recently issued a Technical Advice Note on the matter of Reservoir-related flooding and provided amended policy wording to LDP teams for FLD 5 which has been incorporated.
- 6.21 There are minor changes to the justification and amplification to reflect the most up-to date advice; however, the policy wording is largely the same as PPS 15 and the DAP 2011 policy dealing with flooding has been considered to have been covered adequately by FLD 1.
- 6.22 Clarification was provided by DfI Rivers in relation to Policy FLD 5 – Development in Proximity to Reservoirs. Since March 2016, PPS15 FLD5 has applied to all NI Water Service Reservoirs. DfI Rivers, based on information from NI Water relating to the capacity of Service Reservoirs for flood mapping purposes, considered them to be Controlled Reservoirs. NI Water had recently advised that it was reviewing the volume of water that its Service Reservoirs are capable of holding above the natural level of any part of the surrounding land. DfI Rivers considered that in the absence of this information, none of NI Water’s Service Reservoirs are Controlled Reservoirs under policy and therefore FLD 5 would not apply. The policy title has been amended to reflect this.

General Comment Consideration

- 6.23 In addition to largely retaining the policy wording of PPS 15, DfI Rivers also requested that the Technical appendix from PPS 15 be added to the Chapter. It considered that only those parts which are most relevant and relatively up to date should be included as an annex to the chapter. These are the sections relating to SuDS, flood risk assessments and drainage assessments.
- 6.24 With regard to requests that text make more specific and / or overt references to such things as impacts on the marine area or biodiversity, or the hydraulic capacity of the NI Water network, we have considered each and concluded that they are not all necessary. It is considered that the policies are sufficient to meet regional and district level strategic objectives.

Overall Policy Direction

- 6.25 POP representations, input from Members and consultee responses have all been fully considered in reaching the conclusions in the proposed strategy and the policy wording. The overall structure of the draft Plan Strategy (DPS)

- generally retains the thematic approach used in the POP, set under an overall vision and development strategy.
- 6.26 A number of issues were raised, the main area of contention was whether the LDP pursued Option 1, which was to avoid all further development in flood prone areas, or those forms of development which exacerbate flooding elsewhere, or to follow Option 2 – allows some types of development in flood prone areas in line with SPPS / PPS and with appropriate mitigation.
- 6.27 On the advice of the expert body, DfI Rivers, option 1 was ruled out as being ‘practically unachievable’ as it would not allow for strategic and / or essential development. However, Option 2, through its exceptions would allow for limited development, including for example in defended areas or undefended areas where land is raised (subject to other criteria being met). Importantly, it does not make exception for proposals for bespoke accommodation for vulnerable groups or proposals which would significantly intensify a use. Thus it is a balanced approach, both practical and precautionary.
- 6.28 This proposed strategy of the LDP is in line with the RDS, SPPS and the regional strategic objectives, in line with Option 2 as referred to in the POP. The strategy has also been influenced by the aims of the District’s Strategic Growth Plan and the recognition that the District has known areas of significant flood risk. It is considered appropriate that the strong operational guidance within PPS 15 is retained, with largely the same wording carried forward to ensure we have a robust policy framework going forward for the LDP.
- 6.29 This LDP seeks to inform the public of the policy framework and land use proposals that will guide development decisions within the District and promote sustainable development and promote public awareness of flood risk and flood risk information. It also promotes an integrated and sustainable approach to the management of development and flood risk which contributes to; the safety and well-being of everyone, the prudent and efficient use of economic resources, the conservation and enhancement of biodiversity, and the conservation of archaeology and the built heritage.
- 6.30 Therefore, the proposed LDP PS approach is to adopt a precautionary approach to development in areas of flood risk. Only suitable types of development, considered as an exception under the policy, will be permitted in areas at risk of flooding, with adequate mitigation / compensation measures and the latest flood risk information that is available will be used in order to manage such development.
- 6.31 Sustainable and inclusive development is at the heart of the LDP and the LDP is required to strike a balance in meeting the economic, social and environmental needs of the current population, without compromising the ability of future generations to meet their own needs. This includes a presumption in

favour of sustainable development to improve and enhance the balance between economic, social and environmental conditions to deliver economic success, and a better quality of life for people living in the District.

- 6.32 It is considered the above policies meet the strategic direction of the relevant legislation and guidance for Development and Flooding, as well as positively managing such development in a sustainable manner appropriate to this District.
- 6.33 The policies/strategy have been subjected to Sustainability Appraisal (SA) (which incorporates the Strategic Environmental Assessment), Rural Needs Impact Assessment (RNIA), Equality Impact Assessment (EQIA) and Habitats Regulations Assessment (HRA).

7.0 Sustainability Appraisal

- 7.1 Throughout their formulation, the policies contained within the Development and Flooding Chapter have been subject to an ongoing internal sustainability appraisal (SA). This is in addition to the wider external SA, conducted by Shared Environmental Service as part of the wider suite of impact assessments/appraisals required under the Planning Act (Northern Ireland) 2011. The internal appraisal was carried out with the fourteen objectives of the external appraisal in mind (refer to the SA report for more information).
- 7.2 The process of sustainability appraisal aims to ensure that a council's approach towards flood risk is the most sustainable of all reasonable options available i.e. having considered any reasonable alternatives. In the case of flood risk policies, it is not considered that any of the alternatives could be considered to be reasonable. To relax these policies would result in a significant increase in flooding impact on development but to strengthen them to the degree of allowing no exceptions has been characterised by DfI Rivers as practically unachievable in that it would not allow for essential or strategic development. Moreover, DfI Rivers advised that PPS 15 (Revised) Planning and Flood Risk is very technical in nature and is established and tested so for these reasons also it is considered that no reasonable alternatives exist.
- 7.3 With regard to the degree of sustainability of each the resulting proposed policies, this is outlined below:

Policy FLD 1 - Development in Fluvial (River) and Coastal Flood Plains

- 7.4 The policy option has a minor positive impact on the objectives to improve health and wellbeing and to provide good quality, sustainable housing by ensuring that development is located away from areas of identified risk. A negligible effect is identified for strengthening society.
- 7.5 The policy option has a minor positive impact on the objective to enable sustainable economic growth, as it helps to ensure that new economic development is located away from areas of identified flood risk, while retaining the flexibility to respond to future changes in flood hazard and risk projections. A similar influence is reported for material assets through directing infrastructure away from risk areas, however the overall effect is considered to be negligible.
- 7.6 Negligible impacts are recorded for many of the environmental sustainability objectives, however this policy will have a significant positive impact on the objective to protect, manage and use water resources sustainably by reducing future requirements for flood defences and reducing risk of pollution from flooding events.
- 7.7 Minor positive impacts are also identified for the objectives to reduce causes of and adapt to climate change, to protect natural resources and enhance

biodiversity and to maintain and enhance landscape character as this policy will promote the retention of natural areas, including coastal areas, which provide resilience to storm events and flooding episodes.

Policy FLD 2 – Protection of Flood Defence and Drainage Infrastructure

- 7.8 The option has a significant positive effect on the objective to improve health and well-being by enabling assets which perform an important health and safety function to be safeguarded, which is particularly significant in the context of the council's baseline. While some positive influences on the other social sustainability objectives are noted, these are not thought to be enough raise a perceptible effect.
- 7.9 A minor positive impact is identified for the objective to enable sustainable economic growth as some of our district's town centres and economic development areas are heavily reliant on flood defence infrastructure and it is important to retain the ability to maintain, repair or upgrade these assets. This will also benefit infrastructure in the context of the material assets objective, however the effect is not considered to be strong enough to raise a perceptible impact.
- 7.10 The policy will help to maintain undeveloped areas adjacent to rivers and coastal plains, will deliver additional resilience to areas and reduces the risk of mobilising pollutants into the aquatic and natural environment from a flood event. Consequently, positive impacts are identified for the environmental sustainability objectives to reduce causes of and adapt to climate change, to protect and to protect natural resources and enhance biodiversity and significant positive effects on managing and using water resources sustainably.

FLD 3 - Development and Surface Water (Pluvial) Flood Risk Outside Flood Plains

- 7.11 The option has a significant positive effect on the objective to improve health and well-being by ensuring that certain types of new development do not lead to increased pluvial flood risk, which is particularly significant in the context of the council's baseline. No perceptible effects are identified on the other social sustainability objectives.
- 7.12 A minor positive impact is identified for the objective to enable sustainable economic growth as some of our district's town centres are vulnerable to pluvial flooding. The requirement for drainage assessment, where applicable, will benefit all types of development.
- 7.13 The policy will help to futureproof new development against the effects of climate change and ensure that drainage is designed to cope with increased intensity rainfall episodes. This will provide resilience and will reduce the risk of

mobilising pollutants into the aquatic and natural environment from pluvial flooding.

- 7.14 Consequently, positive impacts are identified for the environmental sustainability objectives to reduce causes of and adapt to climate change, to protect and to protect natural resources and enhance biodiversity (becoming significant in the long term) and significant positive effects on managing and using water resources sustainably. The requirement for a drainage assessment to consider effects on features of importance to the historic environment will also benefit this objective and a minor positive impact is identified.

FLD 4 – Artificial Modification of Watercourses

- 7.15 The policy will deliver several positive influences on several of the social and economic sustainability objectives, through the safeguarding and retention of natural features. However, no perceptible impacts are identified for these objectives.
- 7.16 Positive effects are identified for many of the environmental sustainability objectives through the retention of areas of semi-natural land within development. Restricting canalisation and culverting will protect natural habitats that capture water and may help to encourage the incorporation of SuDS into design. This will have a minor positive effect on the climate change and landscape objectives and a significant positive effect on the water resources and natural resources objectives.

No other impacts are identified for the remaining environmental sustainability objectives.

Policy FLD 5 - Development in Proximity to Controlled Reservoirs

- 7.17 The policy option has a minor positive impact on the objectives to improve health and wellbeing and to provide good quality, sustainable housing by ensuring that development is located away from areas of identified risk. A negligible effect is identified for strengthening society.
- 7.18 The policy option has a minor positive impact on the objective to enable sustainable economic growth, as it helps to ensure that new economic development is located away from areas of identified flood risk, while retaining the flexibility to respond to future changes in flood hazard and risk projections.
- 7.19 A similar influence is reported for material assets through directing infrastructure away from risk areas, however the overall effect is considered to be negligible.
- 7.20 Negligible impacts are recorded for many of the environmental sustainability objectives, however this policy will have a significant positive impact on the objective to protect, manage and use water resources sustainably by reducing

future requirements for flood defences and reducing risk of pollution from flooding events.

- 7.21 Minor positive impacts are also identified for the objectives to reduce causes of and adapt to climate change, to protect natural resources and enhance biodiversity and to maintain and enhance landscape character as this policy will promote the retention of natural areas, including coastal areas, which provide resilience to storm events and flooding episodes.
- 7.22 A draft Habitats Regulations Assessment (HRA) has also been undertaken and published for consultation with the Draft Plan Strategy. It similarly determines possible adverse effects on the integrity of European sites (Special Areas of Conservation and Special Protection Areas) as a result of the policies within the LDP. This assessment also includes Ramsar sites under the provisions of the Ramsar Convention. Please refer to the full HRA document for full details.

8.0 Equality Impact Assessment

- 8.1 Section 75 of the Northern Ireland Act 1998 requires that public authorities have due regard to the need to promote equality of opportunity and good relations between persons of a particular religion, political opinion, race, age, marital status, sexual orientation or gender. It also includes people with disabilities or those with primary responsibility for the care of a dependant, such as an elderly person. These are known as ‘Section 75’ groups.
- 8.2 The policies contained within the Development and Flooding Chapter have been subject to an equality impact assessment (EQIA) to ensure no adverse impact on these groups.
- 8.3 In respect of the flood risk policies, it is considered that curtailing development in an area that may be predominantly inhabited by one community would have an adverse effect on those of a particular religion and / or political opinion; however the policies target areas of identified flood risk or development proposals that may create or exacerbate same. While this may have a greater impact on one group over another as a side effect, the absence of such policies would almost certainly lead to more significant adverse impacts on those same groups and may also have a wider impact as a knock on effect. Moreover, consultation shows that these policies are welcomed, especially in light of the August 2017 flood event.

9.0 Rural Needs Impact Assessment

- 9.1 The Rural Needs Act 2016, requires District Councils and other Public Authorities to have due regard to rural needs when developing, adopting, implementing or revising policies, strategies and plans, and when designing and delivering public services.
- 9.2 To ‘have due regard’ means that a public authority must consciously consider the needs of people in rural areas. How much ‘due regard’ depends on the circumstances and, in particular, on the relevance of rural needs to the decision or function in question. The greater the relevance and potential impact for people in rural areas, the greater the regard required by the duty.
- 9.3 Throughout the formulation of the draft Plan Strategy, there has been consideration of the impact of each policy approach on the rural area, relative to the urban area and policies have been amended where it was deemed appropriate to do so. In the case of Flooding Development policies, no amendments were considered necessary.
- 9.4 Flooding can be a potential issue for all areas as it can stem from several sources and it is generally considered that there is no significant differential. However, given that there are restrictions on acceptable development in the countryside (other than defined categories) and given that development in smaller settlements is normally of a smaller scale, if there is a significant differential impact it would be in favour of the rural area in that less development would have a lesser potential for surface water flooding. It is therefore considered that the proposed flooding policies do not favour urban areas over rural areas but rather have largely the same effect.

Appendix 1

[The Practical Application of Strategic Planning Policy for ‘Development in Proximity to Reservoirs’](#)

[Technical Flood Risk Guidance In Relation to Allowances for Climate Change in Northern Ireland](#)

[DfI Rivers Flooding Map Viewer](#)

Please note: the flood mapping is an ongoing process and is updated cyclically. The information presented therein is therefore subject to change.

DfI Rivers Guidance on the preparation of local operational planning policies for flood risk management.

DfI Rivers Guidance on the preparation of local operational planning policies for flood risk management.

Introduction

Under the reformed two-tier planning system introduced in April 2015, Councils have considerably enhanced planning powers, including responsibility for the preparation of new Local Development Plans (LDPs). These reforms significantly enhance local democratic accountability and provide a new planning system that- is more responsive to the priorities and needs of local people.

Whilst Councils have flexibility to bring forward operational policies tailored to local circumstances obviously these will have to be drawn up bearing in mind regional planning policy. In preparing LDPs Councils must take account of the RDS 2035, the Sustainable Development Strategy for Northern Ireland, the SPSS and any other policies or advice in guidance issued by the Department.

It is recognised that LDPs prepared by Councils are a fundamental tool in the implementation of central government policies and strategic objectives on flood risk, climate change etc. It is therefore of critical importance that LDPs provide robust local operational policies and guidance that align with the policies and advice of DfI in relation to flood risk (and climate change).

Furthermore, the Department's 'North West Flooding Review Report' on the unprecedented flooding event which occurred in August 2017, highlights the importance of having and applying robust planning policies that take appropriate consideration of flood risk both in terms of preparing new local policy through LDPs and when taking decisions.

<https://www.infrastructure-ni.gov.uk/sites/default/files/publications/infrastructure/north-west-flooding-review-2018.pdf>

Councils are encouraged to engage with the Department to assist them in bringing forward future development and flood risk policies that are robust and integral elements of their new LDPs.

Purpose of this guidance

The purpose of this guidance is to assist Councils with the drafting of sound operational planning policies to be included within the Local Development Plan. While it is material to the preparation of Local Development Plans, it is not intended to inform the consideration of planning applications and will therefore have little operational weight. As such, this guidance will not be subject to public consultation or published but will be provided to Councils by DfI in its capacity as a statutory consultation body in the preparation of the Council's Local Development Plan.

This document provides essential background information and definitions. It also highlights the key considerations that should be taken into account to ensure that robust local operational planning policies are formulated and the reasons why these policy considerations are important. The application of this guidance will be monitored and content will be kept under review.

The guidance recognises that Councils have the flexibility to formulate robust local flood risk management policies that meet their local needs and align with the policy provisions of the SPPS. However, Planning Policy Statement 15 (Revised) 'Planning and Flood Risk' (PPS 15) contains robust flood risk management policies that have been proven to work well since its introduction in 2006. DfI Rivers considers that these policies are seen as exemplar across the United Kingdom and Ireland. These policies are closely replicated (in a strategic way) in the Strategic Planning Policy Statement for Northern Ireland. The provisions of the SPPS apply to the whole of Northern Ireland. They must be taken into account in the preparation of LDPs and are material to all decisions on individual planning applications and appeals.

Recommended Approach to Local Flood Risk Policy Formulation

Key Policy Objective	Key Policy Issue	Best Practice Policy Wording	Explanation and Justification	Link to SPPS
Avoiding development in Fluvial (River) and Coastal Flood Plains	Development not permitted in flood plains	Development will not be permitted within the 1 in <u>100 year</u> fluvial flood plain (AEP of 1%) or the 1 in 200 year coastal flood plain (AEP of 0.5%) unless the applicant can demonstrate that the proposal constitutes an <u>exception</u> to the policy (see Table 1).	<p>Avoiding development in flood plains is the most cost-effective and sustainable method of <u>managing</u> flood risk. Flood plains store and convey water during times <u>of</u> flood. These functions are important in the <u>wider</u> flood management system. New development within a river flood plain will not only be at risk of flooding itself, but it will add to the <u>risk</u> of flooding elsewhere. The cumulative effect of piecemeal development within a river flood plain can also redirect flows and will also undermine its natural function in <u>accommodating</u> and attenuating flood water. Accordingly, to <u>minimise</u> flood risk and help maintain their natural function it is necessary to <u>avoid</u> development within flood plains.</p> <p>The situation with coastal flood plains differs from the above, in that in certain limited circumstances (SPPS paragraph 6.109 refers) infilling in the coastal flood plain is permitted as it will have a negligible effect on its extent and therefore much <u>less</u> likely to cause flooding elsewhere.</p> <p>Refer to: Key Consideration 1 - The Precautionary Approach Key Consideration 6 - Flood storage and flood plain infilling.</p>	6.107 6.109

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Key Policy Objective	Key Policy Issue	Best Practice Policy Wording	Explanation and Justification	Link to SPPS
Avoiding development in Fluvial (River) and Coastal Flood Plains	Development permitted within flood plains only by exception	Where the principle of development is accepted by the planning authority through being an exception to policy as detailed in Table 1, the applicant is required to submit a Flood Risk Assessment for all proposals. Planning permission will only be granted if the Flood Risk Assessment demonstrates that: <ul style="list-style-type: none"> a) All sources of flood risk to and from the proposed development have been identified; and b) There are adequate measures to manage and mitigate any increase in flood risk arising from the development. 	It is recognised that in certain exceptional circumstances development in a flood plain may be justified. The exceptional circumstances deemed to be acceptable by DfI Rivers are detailed in Table 1. <p>Granting an exception is the sole responsibility of the Council.</p> <p>DfI Rivers reserves the right to advise against granting an exception if it considers that flood risk to the proposed development and elsewhere cannot be adequately managed and mitigated.</p> <p>Refer to: Key Consideration 6 - Flood Plain Storage and Infilling</p>	6.107 & 6.111
Avoiding development in Fluvial (River) and Coastal Flood Plains	Development Proposals of Overriding Regional or Sub-Regional Economic Importance	A development proposal within the floodplain that does not constitute an exception to the policy may be permitted where it is deemed to be of overriding regional or sub regional economic importance and meets both of the following criteria: <ul style="list-style-type: none"> • Demonstration of exceptional benefit to the regional or sub-regional economy; • Demonstration that the proposal requires a location within the flood plain and justification of why possible alternative sites outside the flood plain are unsuitable. <p>Where the principle of development is established through meeting the above criteria, the Council will steer the development to those sites at lowest flood risk.</p> <p>The applicant is required to submit a Flood Risk Assessment for all proposals.</p>	It is recognised that in certain exceptional circumstances development in a flood plain may be justified. <p>It is the responsibility of the Council to ensure that both criteria are met and then to steer the development to those sites at lowest flood risk.</p> <p>Refer to: Key Consideration 6 - Flood Plain Storage and Infilling</p>	6.107 & 6.111
Avoiding development in Fluvial (River) and Coastal Flood Plains	Minor Development	Minor development will be acceptable within defended and undefended flood plains subject to a satisfactory flood risk assessment.	Minor development is defined in Footnote 32 of SPPS. Minor development such as non-residential extensions with a footprint less than 150 sq. metres, alterations to buildings and householder development will generally negligible effect on flood risk.	6.107 & 6.111

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Key Policy Objective	Key Policy Issue	Best Practice Policy Wording	Explanation and Justification	Link to SPPS
			The detail and complexity of the FRA should be commensurate with the size and complexity of the development.	
Avoiding development in Fluvial (River) and Coastal Flood Plains	Unacceptable Flood Protection / Management Measures	<p>The following flood protection and management measures proposed as part of the planning application, in order to facilitate development within flood plains, will not be acceptable:</p> <p>1 - new hard engineered or earthen bank flood defences;</p> <p>2 - flood compensation storage works (Note - such works may be acceptable in limited circumstances);</p> <p>3 - land raising (infilling) to elevate a site above the flood level within the undefended fluvial flood plain.</p>	<p>1 – New flood defences cause loss of flood plain storage, increase in flood risk elsewhere, potentially putting more people at risk of flooding (where there was no such risk previously) and residual risk.</p> <p>Refer to: Key Consideration 3 - Residual Risk. Key Consideration 4 - Significant Intensification. Key Consideration 6 - Flood storage and flood plain infilling. Key Consideration 8 – Design Flood Standard.</p> <p>2 - Key Consideration 7 - Compensatory Flood Storage provides an explanation as to why flood plain compensation works may be acceptable in limited circumstances.</p> <p>3 – Land raising causes loss of flood plain storage which will increase flood risk elsewhere.</p> <p>Refer to: Key Consideration 6 - Flood storage and flood plain infilling.</p>	<p>Bullet point 3 - 6.109.</p> <p>Bullet points 1 & 2 - 6.110.</p>
Acceptable development in defended areas.	Development in brown field defended areas.	<p>Subject to an Exception being granted by the Council (see Table 1, Exception D1), previously developed land protected by existing flood defences, either cored earthen flood banks or hard engineered walls, constructed to the appropriate standard and height, will generally be considered acceptable for development.</p> <p>DfI Climate Change guidance provides details of the freeboard allowances required for flood defences.</p>	<p>Such development should not expose significantly more people to flood risk.</p> <p>Table 1 lists 5 Exclusions to Exception D1.</p> <p>Exclusions 1 to 5 detail the types of development that should not be permitted in defended areas and in each instance gives the reason(s) why this should be the case.</p> <p>Refer to: Key Consideration 3 - Residual Risk. Key Concept 4 - Significant Intensification. Key Consideration 8 – Design Flood Standard.</p>	-

Key Policy Objective	Key Policy Issue	Best Practice Policy Wording	Explanation and Justification	Link to SPPS
Acceptable development in defended areas.	Presumption against development in green field defended areas.	Proposed policies should contain a presumption against development of green field sites in defended areas.	As well as exposing more people and property to the residual flood risk, this form of development could remove valuable flood storage should the defences overtop or breach. Refer to: Key Consideration 3 - Residual Risk. Key Consideration 4 - Significant Intensification. Key Concept 6 - Flood storage and flood plain infilling. Key Consideration 8 – Design Flood Standard.	-
Acceptable development in defended areas.	Council to direct development to minimise flood risk.	Subject to an Exception being granted by the Council for development in brown field defended areas (see Table 1, Exception D1), it is the role of the Planning Authority to direct developers to use the areas of least risk.	Development close to flood defences will be resisted as such land will often be low lying and therefore the most susceptible to flooding. Also, it may need to be available for temporary flood storage in a flood event. The Council has a responsibility to direct developers to use the areas of least risk. DfI Rivers will provide advice on this if consulted by the Council. Before progressing proposals in proximity to flood defences, developers are advised to seek guidance from DfI Rivers on acceptable separation distances.	-
Acceptable development in flood plains.	Development in coastal flood plain.	Proposed policies could permit new development in the undefended coastal flood plain in specific, limited circumstances. Such development should not result in additional flood risk elsewhere in the coastal flood plain. In order to minimise the potential incidence of coastal erosion to the development (or elsewhere as a result of it), particularly in areas of 'soft' coastline, development should only be permitted within settlements where a built footprint will have already been established. Such proposals will need to satisfy normal planning criteria such as access, service provision and acceptable visual and amenity impacts. Importantly, such development should not generate a present or future need for flood defences nor should it exacerbate problems of coastal erosion in	Infilling and land raising to an appropriate level above the flood plain will have a negligible effect on the extent of the coastal flood plain, now or in the future, taking account of anticipated climate change.	6.109

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Key Policy Objective	Key Policy Issue	Best Practice Policy Wording	Explanation and Justification	Link to SPPS
		susceptible areas.		
Acceptable development in flood plains.	Replacement buildings in flood plains or defended areas.	<p>Refer to Table 1, Exception U1.</p> <p>Replacement of an existing building may be considered on the basis that this should not normally result in any material increase in the flood risk to the development or elsewhere. Suitable flood proofing measures through resistance and resilience construction should be used.</p> <p>There should be a presumption against development where proposals include essential infrastructure, storage of hazardous substances, bespoke accommodation for vulnerable groups or development located close to flood defences.</p> <p>Proposals involving significant intensification of use should be considered on their individual merits and will be informed by the Flood Risk Assessment.</p>	<p>The replacement of a building to provide bespoke accommodation allowing for the introduction of vulnerable groups to the flood risk area is unacceptable.</p> <p>Similarly, replacement of a building to accommodate essential infrastructure will be unacceptable as continual access and egress for operational activities will no longer be possible when the area has been cut off during a flood event.</p> <p>A replacement proposal which involves significant intensification of use, for example through increasing the existing footprint or change of use, will be resisted if this would have the effect of introducing more people to a high flood risk area.</p>	Partially covered by 6.108 & Figure 1.
Acceptable development in flood plains.	Amenity and recreation – General Policy	<p>Refer to Table 1, Exception U4.</p> <p>Proposed policies should permit provision of areas for amenity open space, sports, outdoor recreation and nature conservation purposes in flood plains where justified by an acceptable flood risk assessment.</p> <p><u>Children's playgrounds should not be permitted in flood plains as such proposals would have the effect of exposing a vulnerable group to flood risk.</u></p> <p>Ancillary development such as changing facilities and job-related accommodation for caretakers and staff (<u>but excluding clubhouses and social facilities</u>) may be acceptable where justified by the flood risk assessment.</p> <p>The use of synthetic sports surfaces should be resisted. Where this would increase the flood risk to the site or elsewhere. It should</p>	<p>Proposed policies should allow for the provision of areas for amenity open space, sports, outdoor recreation and nature conservation purposes on the basis that such areas are not generally occupied and are unlikely to incur major damage as a result of flood inundation.</p> <p>In some circumstances, it may be possible to incorporate flood alleviation measures to the benefit of the wider community e.g. <u>Connswater Community Greenway</u> in Belfast.</p> <p>Changing rooms are intermittently occupied and can be made resilient against flooding i.e. if they flood, they can be brought back into service quickly and with minimum cost.</p> <p>Clubhouses and social facilities may be occupied for extended periods by many people. Flooding can put these people at risk. Post-flooding repairs can be protracted and expensive.</p> <p>Synthetic sports surfaces may increase the flood</p>	Partially covered by 6.108 & Figure 1.

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Key Policy Objective	Key Policy Issue	Best Practice Policy Wording	Explanation and Justification	Link to SPPS
			Refer to: Key Consideration 6 – Flood storage and Flood Plain Infilling.	
Flood Management and Mitigation Measures for all development in flood plains	Flood Risk Assessment	Where, by exception or overriding need, built development is acceptable in principle in the flood plain, then a Flood Risk Assessment (FRA) is required.	DfI Rivers will publish a FRA specification. A FRA must demonstrate the measures that shall be taken to manage and mitigate the identified risks. These measures will be proportionate to the flood risk and generally will be more rigorous in undefended areas than in defended areas where the flood risk is lesser.	6.111
Protection of Flood Defence and Drainage Infrastructure	Development should not impede effectiveness of flood defence and drainage infrastructure.	Proposed policies should not permit development that would impede the operational effectiveness of flood defence and drainage infrastructure or hinder access to enable their maintenance.	Where a new development proposal is located near a flood defence, control structure or watercourse it is essential that it should not compromise the function of that structure or the ability to maintain it. Key Consideration 11 - Maintenance Requirements for Flood Defence and Drainage Infrastructure details the necessary requirements in this area.	6.123
Protection of Flood Defence and Drainage Infrastructure	Presumption against building over the line of a culvert	Proposed policies should contain a general presumption against the erection of buildings or other structures over the line of a culverted watercourse in order to facilitate replacement, maintenance or other necessary operations.	Constructing buildings over culverts could cause structural problems in both the building and the culvert. Structural damage to the culvert could increase flood risk to the building and elsewhere. Constructing buildings over culverts could cause problems when carrying out maintenance or effecting repairs. Refer to: Key Consideration 11 - Maintenance Requirements for Flood Defence and Drainage Infrastructure	6.123
Development and Surface Water (Pluvial) Flood Risk Outside Flood Plains	Thresholds for provision of a Drainage Assessment.	A Drainage Assessment will be required for all development proposals that exceed any of the following thresholds: * A residential development comprising of 10 or more dwelling units; * A development site in excess of 1 hectare; * A change of use involving new buildings and / or hard surfacing exceeding 1000 square metres in area.	DfI Rivers will publish a Drainage Assessment Specification. Development with the associated increase in impermeable surfaces increases the amount of surface water runoff which can lead to surface water flooding to both the proposed development and elsewhere if not properly addressed at design stage.	6.114

Derry City and Strabane District Council LDP Draft Plan Strategy – Development and Flooding

Key Policy Objective	Key Policy Issue	Best Practice Policy Wording	Explanation and Justification	Link to SPPS
			<p>The purpose of a Drainage Assessment is to consider these risks and provide appropriate mitigation.</p> <p>Refer to: Key Consideration 9 - Surface Water Flooding</p>	
Development and Surface Water (Pluvial) Flood Risk Outside Flood Plains	Additional criteria for a Drainage Assessment.	<p>A Drainage Assessment will also be required for any development proposal, except for minor development, where:</p> <ul style="list-style-type: none"> • The proposed development is located in an area where there is evidence of a history of surface water flooding. • Surface water run-off from the development may adversely impact upon other development or features of importance to nature conservation, archaeology or the built heritage. 	<p>It is important not to exacerbate existing surface water flooding problems or increase flood risk elsewhere.</p> <p>Unrestricted additional run-off due to development of a site discharging to a watercourse will increase flows and may increase flood risk downstream.</p> <p>A Drainage Assessment will be required when evidence of drainage problems is presented to the Planning Authority, even if the development does not meet the above criteria for a Drainage Assessment.</p> <p>Refer to: Key Consideration 1 – The Precautionary Approach Key Consideration 9 - Surface Water Flooding</p>	6.114
Development and Surface Water (Pluvial) Flood Risk Outside Flood Plains	Drainage Assessment must demonstrate adequate mitigation .	Development should only be permitted where it is demonstrated through the Drainage Assessment that adequate measures will be put in place so as to effectively mitigate the flood risk to the proposed development and from the development elsewhere.	Adequate mitigation measures are required not to exacerbate existing surface water flooding problems or increase flood risk elsewhere.	6.114
Development and Surface Water (Pluvial) Flood Risk Outside Flood Plains	Developer's responsibility to assess and mitigate flood risk .	Where a Drainage Assessment is not required by policy but there is potential for surface water flooding as indicated by the surface water layer of the Flood Maps (NI), it is the developer's responsibility to assess the flood risk and drainage impact and to mitigate the risk to the development and any impacts beyond the site.	Even if a proposed development does not meet the above criteria for a Drainage Assessment, it is the Developer's responsibility to take into account flooding from all sources including surface water.	-

Derry City and Strabane District Council LDP Draft Plan Strategy – Development and Flooding

Key Policy Objective	Key Policy Issue	Best Practice Policy Wording	Explanation and Justification	Link to SPPS
Development and Surface Water (Pluvial) Flood Risk Outside Flood Plains	Fluvial and/or coastal flood risk takes precedence.	Where the proposed development is also located within a fluvial or coastal flood plain, then the fluvial and/or coastal policies will take precedence.	Fluvial and Coastal flooding pose a higher risk and thus should take precedence over surface water flooding.	6.115
Development and Surface Water (Pluvial) Flood Risk Outside Flood Plains	Council to consult with DfI Rivers	In assessing the need for a drainage assessment the Council may consult with DfI Rivers. This may be necessary in order to establish whether there is evidence of a history of surface water flooding at a particular location. Consultation will also be carried out as necessary in appraising the drainage assessment. This is necessary not only to assess the adequacy of the proposed control and mitigation measures in the context of the policy, but also to afford the opportunity for such bodies to assess the impact of the measures upon their infrastructure.	Only DfI Rivers has the necessary knowledge and skills to advise on, and assess Drainage Assessments.	-
Development and Surface Water (Pluvial) Flood Risk Outside Flood Plains	Long term maintenance of mitigation measures.	Where a Drainage Assessment for a proposal is acceptable, the Planning Authority will need to be satisfied that suitable arrangements are in place in regard to the long term management and maintenance of the infrastructure on which mitigation depends.	Many mitigation measures require regular maintenance and if that is not provided they will quickly become ineffective thus increasing flood risk to the development and elsewhere.	6.113 (partially)
Artificial Modification of Watercourses	Only in exceptional circumstances.	The Council will only permit the artificial modification of a watercourse, including culverting or canalisation, operations, in either of the following exceptional circumstances:	Artificial modification of a watercourse, including culverting or canalisation, operations should be resisted as such works can have a significant adverse impact on the environment and can increase flood risk. Refer to: Key Consideration 10 - Problems associated with culverting and artificial modification of watercourses	6.125
Artificial Modification of Watercourses	Culverting for access	• Where the culverting of short length (maximum 10 m) of a watercourse is necessary to provide access to a development site or part thereof;	The length and number of access culverts should be kept to a minimum.	6.125

Derry City and Strabane District Council LDP Draft Plan Strategy – Development and Flooding

Key Policy Objective	Key Policy Issue	Best Practice Policy Wording	Explanation and Justification	Link to SPPS
Artificial Modification of Watercourses	Culverting for engineering reasons	<p>• Where it can be demonstrated to the satisfaction of DfI Rivers that a specific length of watercourse needs to be culverted for engineering reasons and that there are no reasonable or practicable alternative courses of action.</p>	<p>Based on <u>past experience</u>, DfI Rivers has found many instances where the reasons offered for culverting watercourses could not be considered to be "valid engineering reasons". Accordingly, DfI Rivers requests that the specific wording "to the satisfaction of DfI Rivers" is included in any proposed policy.</p>	6.125
Development in Proximity to Reservoirs	New Development	<p>Paragraphs 6.119 to 6.122 of the Strategic Planning Policy Statement for Northern Ireland (SPPS) set out the planning policy for development in proximity to controlled <u>reservoirs</u>. (refer to "Definitions").</p> <p>To achieve robust policies, DfI Rivers recommends the following minor additions to <u>the SPPS</u>.</p>	<p>Reservoirs constitute a potential source of flood risk that can have serious consequences. Flooding of downstream areas within what is <u>known</u> as the area of inundation may ensue if the structure fails or is overtopped. Downstream flooding may also arise from the controlled release of water from the reservoir, for example via spillways during periods of high flows due to weather conditions. This is normal practice to avoid capacity exceedance and overtopping. In any of these <u>circumstances</u>, there is potential for rapid inundation of downstream areas and response times to flooding are likely to be short. This is especially the case where reservoir failure triggers <u>land slips</u>, resulting in a sudden uncontrolled release of water.</p> <p>There are two main considerations when determining planning applications for development within the inundation area of a controlled reservoir:</p> <ol style="list-style-type: none"> 1. Condition assurance – With regard to proposed new development the Planning Authority must be assured that the condition, management and maintenance regime of the reservoir are appropriate regarding reservoir safety. 2. A Flood Risk Assessment - This, among other things, considers the depth and velocity of <u>flood water</u> at the proposed development site in the event of a dam failure and the measures proposed by the applicant to mitigate the depth and velocity of the flood water. 	6.119 to 6.122 provides full <u>coverage</u> .

Key Policy Objective	Key Policy Issue	Best Practice Policy Wording	Explanation and Justification	Link to SPPS
			<p>Refer to: Key Consideration12 – Implications of development within the flood inundation area of Controlled Reservoirs.</p>	
Development in Proximity to Reservoirs	Replacement Buildings	<p>A <u>proposal for the replacement of an existing building within the potential flood inundation area downstream of a controlled reservoir</u> must be accompanied by a <u>Flood Risk Assessment</u>. Planning permission should be <u>granted</u> provided it is demonstrated that there is no material increase in the flood risk to the development or elsewhere.</p>	<p>This is a simple addition to the SPPS.</p>	-

Technical definitions and why they are important.

To create robust flood risk management policies it is important that there are clear and unambiguous definitions of technical terms. Where definitions are inadequate or absent this creates the opportunity for alternative interpretations which may lead to weakened policies that could potentially result in increased flood risk to people and property. Technical terms are defined in Table 2 of the Annex.

Key Considerations

Introduction to Key Considerations

In preparing your Local Development Plan (LDP), the Council may wish to consider the following:

- 1 - The Precautionary Approach
- 2 – The DfI Rivers flood maps, Flood Maps (NI) change and evolve over time
- 3 - Residual Risk
- 4 - Significant Intensification
- 5 - Flooding and Climate Change
- 6 - Flood storage and flood plain infilling
- 7 – Compensatory Flood Storage
- 8- Design Flood Standard.
- 9 - Surface water flooding
- 10 - Problems associated with culverting and artificial modification of watercourses.
- 11 – Maintenance Requirements for Flood Defence and Drainage Infrastructure
- 12 - Implications of development within the flood inundation area of controlled reservoirs
- 13 - Consideration of hydro-electric power generation schemes

The detailed policies within PPS 15 (and the strategic provisions of the SPPS) are proven to work and DfI Rivers considers that these policies are seen as exemplar

across the United Kingdom and Ireland. The above key considerations are at the heart of policies in PPS 15 and the SPPS. It is vitally important that future Local Plan Policies take full account of these key considerations. Not to do so would be a significant backward step that will put more people and property at risk of flooding and could potentially result in a LDP being unsound.

The Key Considerations are presented in this guidance in order to promote understanding of flood risk management and to support the preparation of comprehensive and robust flood risk management policies in LDPs.

Key Considerations

1 - The Precautionary Approach

Paragraph 6.102 of SPPS states "The Regional Development Strategy 2035 (RDS) ... urges the planning system to adopt a precautionary approach to development in areas of flood risk and the use of the latest flood risk information that is available in order to properly manage development"

2 – The DfI Rivers flood maps, Flood Maps (NI) change and evolve over time

From a policy perspective, the extent of flood plains is as defined on Flood Maps (NI) (reference: SPPS Paragraph 6.106 Footnote 31 on page 63).

SPPS Paragraph 6.104 states "The regional strategic objectives for the management of flood risk are to ensure that the most up to date information on flood risk is taken into account when determining planning applications and zoning / designating land for development in Local Development Plans".

Flood Maps (NI) is an interactive map-viewer that enables the public to access the latest flood hazard information available from government.

Flood Maps (NI) can be viewed at: <https://www.infrastructure-ni.gov.uk/topics/rivers-and-flooding/flood-maps-ni>

Flood Maps (NI) highlights the areas throughout Northern Ireland that are prone to flooding and its potential adverse impacts.

The map is designed to:

- Help us and others to plan and manage our work to reduce flood risk.
- Encourage people living and working in areas prone to flooding to find out more and take appropriate action.
- Inform anyone applying for planning permission if flooding is likely to be an important consideration.

Flood Maps (NI) contains indicative flood maps for rivers, coastal and surface water flooding, with both present day and future climate change mapping for each. Flood Maps (NI) also contains details of previously recorded flood events.

The flood maps on Flood Maps (NI) are regularly reviewed and updated for a variety of reasons such as improved understanding of flooding mechanisms after a flood event, improved data sets, improved software and other technical reasons. In addition to this, Flood Maps (NI) is reviewed and updated on a six-yearly cycle to meet the requirements of the Floods Directive.

This results in a series of small incremental changes that are not regionally significant, but may have the potential to affect determination of individual planning applications.

It is important that Councils are aware that the predicted flood extents depicted on Flood Maps (NI) may change, possibly several times, over the duration of a LDP.

3 - Residual Risk

When developing flood risk policy, it is important to recognise that whilst a flood defence system is designed to reduce the risk of flooding, it does not prevent it completely and therefore a residual risk remains. Flood defences are designed to protect land from a specific height of flood water such as a 100 year fluvial or 200 year coastal flood event. The possibility of a flood greater than this occurring and

overtopping the defences (the residual flood risk) will always remain. Residual risk is that which remains after all risk avoidance, substitution and mitigation measures have been implemented, on the basis that such measures can only reduce risk, not eliminate it.

In addition, the potential for structural collapse and breaching of the defences remains and could result in sudden and rapid inundation of flood water. There is also potential for back drainage systems to become overwhelmed as they are unable to discharge effectively when water levels remain high during flood conditions. In all such circumstances floodwater within defended areas is likely to become trapped by the defences, resulting in longer term impacts and may require evacuation and pumping or other engineering solutions to remove.

Because of this residual flood risk, any proposed policy contained within your LDP should place restrictions on the location and/or type of development relative to flood defences:

- **Vulnerable groups**

Development proposals involving bespoke accommodation for vulnerable groups should be resisted. Flood warning and evacuation procedures may be difficult to implement for people with disabilities or those whose mobility is otherwise impaired, therefore their risks of injury or fatality are somewhat greater than for the general population. Accordingly, because of the residual flood risk, any proposed policy should operate a presumption against permission being granted for development associated with vulnerable groups. This includes facilities such as children's nurseries, schools, residential care / nursing homes, sheltered housing and hospitals. This list is not exhaustive.

- **Essential Infrastructure**

Development proposals for essential infrastructure, such as for emergency services / emergency depots, power supply and telecommunications should be resisted because access and uninterrupted operation cannot be guaranteed in locations where there is a residual flood risk.

- **Hazardous materials and potential pollutants**

Development proposals involving the storage and processing of hazardous materials and potential pollutants which may be likely to give rise to significant levels of environmental pollution in the event of damage caused by flooding should be discouraged because of the residual flood risk in defended areas. Therefore, when preparing policy Councils may wish to reinforce that proposals for development associated with the storage of hazardous substances, fuel storage depots, sewage treatment works or other development likely to give rise to environmental pollution in the event of flooding should only be granted planning permission where it is demonstrated that an alternative lower risk location is not available and that adequate provision is made for pollution containment so as to prevent a pollution incident in the event of flooding.

- **Significant Intensification**

Because of residual risk, development involving a significant intensification of use should be resisted.

4 - Significant Intensification

A typical example of significant intensification is the conversion of a single dwelling unit or commercial/industrial premises to a number of dwellings. Such intensification of use exposes more people to the residual flood risk in defended areas.

However, whilst such development is not desirable in the context of flood risk, this factor must be balanced against other material considerations, including the provisions of other subject policies within the SPPS that may support higher density development in urban areas. Accordingly, as there is no precise definition or quantification of significant intensification, the Council may wish to stress that each application will be determined on its individual merits taking account of the scope for mitigation of the residual flood risk.

DfI Rivers will generally advise against significant intensification as it will expose more people to flood risk.

5 - Flooding and Climate Change

There is an almost universal acceptance amongst leading scientists and governments that climate change caused by human activity is taking place. World-wide, there is much research taking place to try to establish the impact of climate change and how it will affect our world.

Flooding is part of the natural cycle of rivers and the sea. The primary causes of flooding are many and varied and sometimes involve a complex interaction of several contributory factors. Flooding is mainly weather-driven, but can be exacerbated by infrastructure deficiencies and inappropriate development. At present, climate change is not the primary cause of flooding. Councils may however wish to highlight that climate change is a factor that will exacerbate flooding. As climate change has an increasing impact on weather systems over time, it will have more impact on flooding in the future.

6 - Flood storage and flood plain infilling

Paragraph 6.109 of SPSS states "Land raising (also known as infilling), which involves permanently elevating a site to an acceptable level above the fluvial flood plain in order to facilitate development will not be acceptable within the fluvial flood plain, where displacement of flood water would be likely to cause flooding elsewhere".

A flood plain is part of the natural topography of a river system. Its purpose is to occasionally store and convey floodwater. River flood plains have a finite capacity to store floodwater and this is known as "flood storage".

Councils should be aware that if any built development were to occur in a flood plain, this would cause piecemeal reduction of the volume of flood storage available. This has the effect of displacing floodwater which will cause or exacerbate flooding elsewhere. Development in river flood plains can also cause damage to river channels and structures due to increased flow velocities and it also has the potential to impair the conveyance function of the flood plain and its ecological integrity.

For these reasons, and also the need to limit exposure of people and property to flood risk, draft policies should resist built development and infrastructure works, particularly on green field flood plain sites.

The situation for development in the coastal flood plain differs, permitting infilling in certain circumstances. Paragraph 6.109 of SPPS continues: "Such operations within the coastal flood plain will have a negligible effect on its extent and therefore much less likely to cause flooding elsewhere. Land raising to facilitate development at an appropriate level above the coastal flood plain may therefore be possible. However, this should normally be restricted to settlements and proposals will need to satisfy normal planning criteria such as access, service provision and acceptable visual and amenity impacts. Importantly, such development should not generate a present or future need for flood defences nor should it exacerbate problems of coastal erosion in susceptible areas".

7 – Compensatory Flood Storage

Compensatory flood storage is a means of mitigating the loss of flood plain storage caused by development i.e. flood plain infilling.

However, compensatory flood storage must become effective at the same point in a flood event as the lost storage would have done. It should also provide the same volume, and be at the same level relative to flood level, as the lost storage. This requirement is often referred to as “level for level” or “direct” compensation.

If the compensatory storage is provided at another level it will already be full (if lower) or still be empty (if higher), when the storage is required, and the characteristics of flood storage at this location will, therefore, be altered. For this reason, the compensatory flood storage must be created adjacent to and be hydraulically connected with the area of development.

Compensatory flood storage should only be acceptable as a mitigation measure after the proposed development has been deemed an Exception to the Policy and the principle of development has been established. When developing policy, it is

important to emphasise that compensatory flood storage should not be used to justify or facilitate development in the flood plain.

A typical example of where compensatory storage may be acceptable is on strategic road improvement schemes such as the A5, A6, A8 and A26.

8- Design Flood Standard

The SPPS defines a river flood plain as the extent of the areas flooded in a 1 in 100 year return period flood (1 in 200 year return period flood for coastal).

It is not uncommon for floods to exceed these return periods. In recent years there have been a number of river floods in Northern Ireland that have been greater than 1:100 years, sometimes by a considerable margin (as was the case in the August 2017 flooding in the North West).

A 1 in 200 year or 1 in 250 year return period flood is a more severe event than a 1 in 100 year flood and it will result in a larger volume of floodwater across a wider area which generates higher flood levels. Councils should recognise that there is no linear relationship between a flood's return period and flood levels. Every river's characteristics are different and topography, development and blockages can have a significant impact on flood levels.

In adopting the definition of a flood plain, as detailed in the SPPS, society and government are identifying what could be considered to be an acceptable balance between development need and managing flood risk economically. It is important that policy makers realise that this threshold can be and has been exceeded.

Therefore when drafting policy, Councils may wish to make clear that appropriate exceedance measures should be considered by a competent designer. A typical example of exceedance measures is the use of open space for flood storage.

Refer also to the definition of freeboard, climate change and Key Consideration 3 - Residual Risk and Key Consideration 5 – Flooding.

9 - Surface water flooding

Pluvial or surface water flooding occurs as a result of high intensity rainfall which overwhelms natural or man-made drainage systems resulting in water flowing overland and ponding in depressions in the ground. It is a particular problem in urban areas which are often dominated by non-permeable surfaces (e.g. roofs, roads and car parks). Such development inhibits the natural run-off process, often by removing opportunities for surface water storage and restricting infiltration of water into the ground. Surface water runoff and flooding has increased steadily with the expansion of urban areas, the infilling of green spaces and the cumulative effects of minor development such as house extensions and the paving of gardens to provide for patios and car parking.

All of these factors have combined to intensify surface water runoff and place additional pressures on the drainage network, particularly during prolonged periods of high intensity rainfall. It is not uncommon for drainage systems to be overwhelmed during such rainfall events, particularly where blockages occur. The problem is exacerbated in many areas by an outdated drainage infrastructure that has not been upgraded to cope with the rate of development. However, even modern urban drainage systems are designed only to cope with a 1 in 30 year rainfall event while older parts of the network will invariably be operating to a much lower standard.

Damage from pluvial flooding has been a major factor in recent significant flood events in Northern Ireland. In recent flood events it is estimated that up to 80% of the respective total economic damages were attributable to surface water flooding. Although generally localised, this type of flooding may be extended in duration through water being trapped in low lying areas, thus causing more damage to property and greater hardship to the people affected. A flood event caused by an artificial drainage system surcharge can also pose public health risks through foul water contamination.

Areas of predicted surface water flooding and where there is a history of surface water flooding are detailed on the Planning Portal and Flood Maps (NI). Flood Maps (NI) can also assist developers in identifying broad locations where surface water flooding could be a potential problem.

Flood Maps (NI) indicates that approximately 20,000 or 2.5% of the properties in Northern Ireland are sited in an area that is shown to be at risk of flooding from a 1 in 200 year (0.5% AEP) pluvial event greater than 300 mm deep, albeit that many of these properties would already be at risk from fluvial and / or coastal flooding. As a consequence of the predicted increase in the frequency and intensity of extreme rainfall events due to climate change, urban areas are susceptible to an increasing risk of this type of flooding.

10 - Problems associated with culverting and artificial modification of watercourses

A culvert is defined as an enclosed structure that channels water with integral sides, soffit and invert, including a pipe that contains a watercourse as it passes through or beneath a road, railway, building, embankment etc., or below ground.

The artificial modification of watercourses is likely to have impacts which run contrary to the objectives of sustainable development as embodied in the Water Framework Directive, the Floods Directive and the Northern Ireland Sustainable Development Strategy.

Culverting and canalisation are generally considered to be environmentally unsustainable as such operations can adversely impact upon visual amenity in the built environment and can damage or impair the landscape quality, ecological integrity and biodiversity of watercourses. Culverting creates barriers to the passage of fish, while the higher flow velocities generated cause the unnatural movement of sediment, increased erosion downstream and hinder the future recovery of the watercourse.

Whilst culverting may in some instances alleviate local flood risk, it can increase flood risk downstream by the accumulation of higher flows. The installation of protective grilles at culvert inlets may reduce the incidence of blockages within the culvert, but can often become blocked themselves and cause flooding as a result of a high intensity rainfall event or lack of maintenance. Culverting therefore does not completely remove the potential for local flooding.

All new development should aim to be in harmony with the water environment. Good layout and design should promote the retention of open watercourses as a central amenity feature, although re-alignment or diversion to enhance the quality of the site layout will normally be acceptable where there are no overriding environmental concerns. Incorporating watercourses into the open space requirements for new residential development will be preferred to locating them to the rear of properties where they are difficult to maintain or can become dumping grounds contributing to flood risk. Councils may wish to reinforce that where possible the removal of culverts and the re-introduction of the natural watercourse should be encouraged.

Councils should be aware that the adoption of sustainable drainage solutions (SuDS) for the disposal of storm water may be a much more sustainable alternative than culverting or other options involving the artificial modification of watercourses. The use of SuDS source control solutions such as ponds and swales and their integration into new development schemes as amenity features should therefore be encouraged. Such solutions, by negating increased site discharges may reduce the need for flood alleviation/culverting works downstream and any associated maintenance.

It is acknowledged that in exceptional circumstances, culverting of a section of a watercourse may be unavoidable. This may apply where there are insurmountable inherent structural problems such as slope stability and land slippage. However, even in such circumstances, other solutions such as bank reinforcement, gabion wall construction and underpinning should be considered first, as they will usually have lesser long term environmental / ecological impacts. Similarly, where there are health and safety concerns arising from open access to watercourses or hazardous riverbanks, the construction of solid barriers such as fencing, or planting of 'soft' landscape barriers, should be considered as alternatives to culverting.

Policy makers should note that the culverting of short lengths of the watercourse (usually less than 10m) is acceptable to enable access to and from the development as required. The site design however should aim to keep the number of crossings to a minimum.

11 – Maintenance Requirements for Flood Defence and Drainage Infrastructure

Flood defence and drainage infrastructure are critical in providing a level of flood protection to people and property and adequate land drainage. Where a new development proposal is located beside a flood defence, control structure or watercourse, it is essential that an adjacent working strip is retained to facilitate future maintenance by DfI Rivers, other statutory undertakers or the riparian landowners. It is important to consider the following when formulating policy:

Flood Defences & Control Structures: The working strip should have a minimum width of 5 metres, but up to 10 metres where considered necessary, and be provided with clear access and egress at all times. Any variation from the 5 metre wide working strip must be agreed in advance with the relevant local DfI Rivers Area Office.

Open channel watercourses: In the majority of cases, the working strip should extend 5 metres from top of bank on an open watercourse. The working strip should be wide enough to give adequate space from the top of the bank for suitable sized plant to carry out maintenance. Occasionally, there may be reasons for increasing the width of a working strip up to 10 metres, e.g. to facilitate a long reach excavator or where excavator mats are required. On occasion, there may be instances with small urban watercourses where less than 5 metres may suffice. Any variation from the 5 metre wide working strip must be agreed in advance with the relevant DfI Rivers Area Office.

Culverted watercourses: A working strip of minimum 5 metres width is required over the line of the pipe but frequently, more is required, (up to the 10 metres) depending on pipe size and depth of the culvert, in order to give sufficient scope to allow maintenance including replacement or upgrading to a larger culvert.

In addition to the above, the retention of a working strip along watercourses will have further benefits, including general amenity, enhanced biodiversity and increased control over water pollution, the latter assisting in the implementation of the Water Framework Directive.

Councils are reminded that there is a general presumption against the erection of buildings or other structures over the line of a culverted watercourse in order to facilitate replacement, maintenance or other necessary operations.

12 - Implications of development within the flood inundation area of Controlled Reservoirs

The Reservoirs Act (Northern Ireland) 2015 (the Act) provides a proportionate regulatory framework for the maintenance and management of controlled reservoirs in order to protect people, economic activity, the environment and cultural heritage from flooding caused by an uncontrolled release of water due to reservoir failure. The introduction of this regulatory framework is dependent upon the commencement of relevant sections of the Act and the making of subordinate legislation.

A controlled reservoir is defined by the Act as any structure or area that is capable of holding 10,000 cubic metres or more of water above the natural level of any part of the surrounding land.

Councils should make clear aware that any new reservoirs that are constructed or existing reservoirs altered, for whatever purpose, and are capable of holding 10,000 cubic metres or more of water above natural ground level, for example hydroelectric power generation or amenity purposes such as boating or fishing, will be subject to the provisions of the Act.

Paragraphs 6.119 to 6.122 of the SPPS outline the strategic planning policy for development anywhere in the inundation area of a controlled reservoir. When formulating policy, Councils may wish to highlight that there are two main considerations when determining planning applications for such development. These are:

1. Condition Assurance - With regard to proposed new development the Council must be assured that the condition, management and maintenance regime of the reservoir are appropriate regarding reservoir safety.
2. A Flood Risk Assessment - This, among other things, considers the depth and velocity of flood water at the proposed development site in the event of a dam

failure and the measures proposed by the applicant to mitigate the depth and velocity of the flood water.

This may result in restrictions on future development within the inundation zone of the controlled reservoir.

When obtaining assurance regarding the management and maintenance regime of a controlled reservoir with regard to reservoir safety, the developer should engage with the reservoir manager (if it is a different party). This will also provide an opportunity for the manager and developer to jointly consider any structural improvement works required to make the reservoir safe or other implications the development may have for the reservoir manager. The funding of such works is a private matter between the developer and the reservoir manager.

Even in circumstances where a reservoir does not fall within the policy, because it is not capable of holding 10,000 cubic metres or more of water above any part of the surrounding land, it remains the responsibility of the applicant (or suitably qualified person with demonstrable experience in flood risk management) to consider and assess the flood risk and drainage impact of the proposed development and to mitigate the risk to the development and that beyond the site.

DfI is currently drafting, with the help of Councils, guidance on the Practical Application of Strategic Planning Policy for Development in Proximity to Reservoirs. The purpose of the guidance is to provide further information on the requirements of this Policy and clarification on its application.

Reservoir flood extent maps may be viewed at:

<https://dfi-i.maps.arcgis.com/apps/webappviewer/index.html?id=006872dcdd7b43b89d352e0b93190e67>

13 - Consideration of hydro-electric power generation schemes

DfI Rivers recognises and supports the need to generate electricity in a sustainable and environmentally friendly way. However, in some instances, proposals for hydro-electric power generation schemes can pose significant problems for DfI Rivers.

These are set out below:

Key issues with respect to Hydro Power Schemes:

1. **Flood risk** - Generally hydro schemes require construction in the river channel such as a weir to facilitate abstraction of water. Such constructions can cause river levels and flood levels to increase for a considerable distance upstream. Increased water levels can be evident for up to 1.5 km upstream, depending on channel morphology. On occasion, such construction can also increase flood risk downstream for a considerable distance, typically up to 1.5 km.
2. **Erosion of river banks and river bed** - Impoundment structures and discharge structures may cause damage to river channels and river banks due to fast-flowing turbulent water. The length of the downstream turbulent zone is dependent on the size and nature of the scheme and gradient of the channel but typically the downstream effect is around 1.5 km.
3. **Proximity to river flow gauging stations** - DfI Rivers maintains a network of 150 river monitoring stations to collect river flow data which is used locally and nationally for a variety of uses including the assessment and management of water resources, to inform on the design of structures in and around the floodplain and also crucially in flood estimation. Hydro Power Schemes may adversely impact upon a river flow gauging station by removing and returning water at a different rate and direction than under natural conditions thus rendering potentially decades of data collection useless and compromising flood estimation capabilities both locally and nationally. The loss of this information will reduce the pool of information used for flood estimation in the United Kingdom. This has the potential to lead to less accurate flood estimations and subsequently an increase in flood risk.

Creation of new reservoirs - Creation of new reservoirs for hydroelectric power generation which are capable of holding 10,000 cubic metres or more of water above

the natural level of any part of the surrounding land will be controlled reservoirs and subject to the provisions of the Reservoirs Act (Northern Ireland) 2015. It should be noted that in addition to planning permission, many elements in the construction of Hydro Power Schemes will require approval from DfI Rivers under Schedule 6 of the Drainage (NI) Order 1973.

DfI Guidance on Climate change.

DfI Water and Drainage Policy Division will shortly release new technical guidance in relation to allowances for Climate Change in Northern Ireland. This will include guidance for DfI Rivers, DfI Roads and Northern Ireland Water.

Climate change flood maps will move from 2030 Epoch to 2080 Epoch. DfI Rivers will use the 2080 climate change maps in order to provide the most up to date information on flood risk. The 2080 maps should be used in Local Development Plan preparation and for development management purposes.

Sustainable Drainage Systems (SuDS).

DfI Rivers endorses the use of Sustainable Drainage Systems (SuDS).

SuDS provide benefits such as reducing flood risk, and they can improve water quality, amenity and biodiversity.

Policy makers should be aware that when assessing a Drainage Assessment which proposes the use of SuDS elements, the main areas of concern for DfI Rivers are:

1. **Attenuation volume** – The Drainage Assessment should demonstrate that there will be sufficient attenuation volume.
2. **Discharge rate** – The Drainage Assessment should demonstrate that there is a suitable mechanism in place to restrict discharge to the stated rate.
3. **Safe disposal of surface water** - The Drainage Assessment should provide documentary evidence that surface water can safely be discharged to a watercourse (Schedule 6 Consent to Discharge) or NIW storm sewer (Article 161 Consent).

4. **Long-term maintenance** - The Drainage Assessment should provide evidence that a suitable long term maintenance arrangement is in place.

Guidance developed by DfI Water and Drainage Policy Division should be read in conjunction with this document.

APPENDIX

Table 1

Recommended exceptions to Policy on avoiding development in Fluvial (River) and Coastal Flood Plains

Exception to Policy	Explanation and Justification
<p><u>D1 - Defended Areas</u></p> <p>Previously developed land protected by flood defences, provided that the proposed development does not fall into any of the following categories:</p>	<p>Flood defences should be confirmed by DfI Rivers, as the competent authority, as structurally adequate and provide a minimum standard of 1 in 100 year fluvial or 1 in 200 year coastal flood protection.</p>
<p>Exclusion 1 - essential infrastructure such as power supply and emergency services;</p>	<p>Reasons: residual risk, need to maintain access and continuity of service in the event of a flood.</p>
<p>Exclusion 2 - development for the storage of hazardous substances;</p>	<p>Reasons: residual risk and flooding could lead to pollution and environmental damage.</p>
<p>Exclusion 3 - bespoke accommodation for vulnerable groups, such as schools, residential / nursing homes, sheltered housing;</p>	<p>Reasons: residual risk and putting vulnerable groups at risk. Vulnerable groups may not be able to evacuate themselves and it may be difficult for emergency services to evacuate them. This may put emergency services themselves at greater risk.</p>
<p>Exclusion 4 - any development located close to flood defences.</p>	<p>Reasons: residual risk and the need to have adequate space to maintain flood defences. Development located close to flood defences could adversely affect their stability.</p>
<p>Exclusion 5 - Proposals involving significant intensification of use will be considered on their individual merits and will be informed by the Flood Risk Assessment.</p>	<p>Reasons: residual risk and putting more people at risk than would have previously been the case.</p>
<p><u>Undefended Areas</u></p> <p>The types of development listed at Exception U1 to U5 below are acceptable in undefended flood plains.</p>	<p>It is important to consider the safety of the users of such developments and that the proposed development is not at an unacceptable risk of flooding and does not increase flood risk elsewhere.</p> <p>Such development may also require to be constructed with resistance measures to stop the ingress of flood water or resilience measures to ensure that in the event of a flood, the development can be quickly and cheaply become operational again.</p>

Exception to Policy	Explanation and Justification
<p>U1 - Replacement of an existing building. Proposals that include essential infrastructure, storage of hazardous materials or bespoke accommodation for vulnerable groups or that involve significant intensification of use <u>should be avoided</u>.</p>	<p>Essential Infrastructure - Reasons: residual risk, need to maintain access and continuity of service in the event of a flood.</p> <p>Hazardous materials - Reasons: residual risk and flooding could lead to pollution and environmental damage.</p> <p>Bespoke accommodation for vulnerable groups - Reasons: residual risk and putting vulnerable groups at risk. Vulnerable groups may not be able to evacuate themselves and it may be difficult for emergency services to evacuate them. This may put emergency services themselves at greater risk.</p>
<p>U2 - Development for agricultural use, transport and utilities infrastructure, which for operational reasons has to be located within the flood plain.</p>	<p>It is important to consider the safety of the users of such facilities and that the proposed development does not increase flood risk elsewhere.</p>
<p>U3 - Water compatible development such as for boat mooring, navigation and water based recreational use, which for operational reasons has to be located within the flood plain.</p>	<p>It is important to consider the safety of the users of such facilities and that the proposed development does not increase flood risk elsewhere.</p>
<p>U4 - The use of land for sport and outdoor recreation, amenity open space or for nature conservation purposes, including ancillary buildings.</p> <p>This exception does not include playgrounds for children.</p>	<p>It is important to consider the safety of the users of such facilities and that the proposed development does not increase flood risk elsewhere.</p> <p>Children's playgrounds should not be located in flood plains as this puts vulnerable groups at risk.</p>
<p>U5 - The extraction of mineral deposits and necessary ancillary development.</p>	<p>It is important to consider the safety of the users and operators of such facilities and that the proposed development does not increase flood risk elsewhere.</p>

Table 2
Technical Definitions

Term	Definition
Annual Exceedance Probability (AEP)	Annual Exceedance Probability – The annual probability of a flood exceeding the peak floodwater level.
Catchment	The area drained, either naturally or with artificial assistance, by a watercourse, including all drainage channels, tributaries, floodplains, estuaries and areas of water storage
Climate change	Climate change in Inter-governmental Panel on Climate Change (IPCC) usage refers to a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity.
Coastal Flooding	Flooding from sea water, often arising through storm surge
Controlled Reservoir	A Controlled Reservoir as defined by the Reservoirs Act (Northern Ireland) 2015 is any structure or area that is capable of holding 10,000 cubic metres or more of water above the natural level of any part of the surrounding land.
Culvert	An enclosed structure that channels water with integral sides, soffit and invert, including a pipe that contains a watercourse as it passes through or beneath a road, railway, building, embankment etc., or below ground.
Defended area	A 'Defended Area' is that part of the flood plain where flooding would normally occur except for the presence of flood defences. The location of the flood defences and the areas benefiting from their protection are shown on Flood Maps (NI). Flood Maps (NI) can be viewed at: https://www.infrastructure-ni.gov.uk/topics/rivers-and-flooding/flood-maps-ni
Drainage Assessment	A statement of the drainage issues relevant to a development proposal and the measures to provide the appropriate standard of drainage. The detail of the assessment will be proportionate to the nature of the proposal. (It may also be called a Drainage Impact Assessment).
Drainage Infrastructure	Equipment such as culverts, weirs and sluices provided to facilitate drainage.
Estuarine flooding	Estuarine flooding can originate from a combination of both river and coastal sources. In such areas the greatest flood risk, normally the higher flood level and greater area of flood inundation will be considered.

Term	Definition
Flood defence	A structure or works designed to prevent the inundation of land and property from watercourses and/or the sea. Such defences may take the form of floodwalls or embankments or the management of water levels through drainage works. Such flood defences must be publically funded, constructed and maintained by a statutory body such as DfI Rivers.
Flood defence - definition of good condition	A flood defence structure assessed as Structural Grade 1, 2 or 3 by a suitably accredited person using the (UK) Environment Agency T98 methodology. A suitably accredited person is one who is certified as competent in the use of the Environment Agency T98 methodology.
Flood Hazard	The features of flooding which have harmful impacts on people, property or the environment (such as the depth of water, speed of flow, rate of onset, duration, water quality etc.).
Flood Maps (NI)	Flood Maps (NI) is an interactive map-viewer that enables users to access the latest flood hazard information available from government. https://www.infrastructure-ni.gov.uk/node/459#toc-0
Flood plain	The generally flat areas adjacent to a watercourse or the sea where water flows in a flood, or would flow, but for the presence of flood defences. The limits of the flood plain are defined by the peak water level of an appropriate return period event (currently defined as 1 in 100 year or AEP of 1% for the river or fluvial flood plain and 1 in 200 year or AEP Of 0.5% for the coastal flood plain). Flood plains as so defined are depicted on Flood Maps (NI). Flood Maps (NI) can be viewed at: https://www.infrastructure-ni.gov.uk/topics/rivers-and-flooding/flood-maps-ni
Flood Risk	The statistical probability of an event occurring combined with the scale of the potential consequences of that event.
Flood Risk Assessment	A flood risk assessment (FRA) is an assessment of the risk of flooding from all flooding mechanisms, the identification of flood mitigation measures and should provide advice on actions to be taken before and during a flood.
Flood Storage	An area, usually within floodplain where water is stored in time of flood.
Fluvial Flooding	Flooding from a river or other watercourse.
Freeboard	Freeboard is an uncertainty allowance. It is a height (recommended minimum 600mm) added to the predicted level of flood to take account of uncertainty in flood estimation. Flood estimation uses many datasets and complex software all of which have varying degrees of inherent uncertainty. Freeboard may also allow for limited exceedance and also the uncertainty caused by some external factors which may increase flood levels e.g. blocked drainage infrastructure, inappropriate development etc. In coastal situations freeboard allows for wave action, local bathymetric conditions and changes caused by erosion and settlement.

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Term	Definition
Groundwater	Water below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.
Inundation Areas	Areas susceptible to flooding from the 4 main sources, ie rivers, the sea, surface water and reservoirs
Minor development	Non-residential extensions (Industrial/Commercial/Leisure etc.) with a footprint less than 150 sq. metres. Alterations: development that does not increase the size of buildings, e.g. alterations to external finishes. 'Householder' development: e.g. sheds, garages, games rooms etc. within the curtilage of the existing dwelling in addition to extensions to the existing dwelling. This excludes any proposed development that would create a separate dwelling within the curtilage of the existing dwelling e.g. subdivision of a dwelling house into flats.
Pluvial Flooding	Usually associated with convective summer thunderstorms or high intensity rainfall cells within longer duration events, pluvial flooding is a result of rainfall-generated overland flows which arise before run-off enters any watercourse or sewer. The intensity of rainfall can be such that the run-off totally overwhelms surface water and underground drainage systems.
Precautionary Approach	The approach to be used in the assessment of flood risk which requires that lack of full scientific certainty, shall not be used to assume flood hazard or risk does not exist, or as a reason for postponing cost-effective measures to avoid or manage flood risk.
Reservoir	Any structure or area that is capable of holding water above the natural level of any part of the surrounding land. See also "Controlled Reservoir".
Resilience	Sometimes known as 'wet-proofing', resilience relates to how a building is constructed in such a way that, although flood water may enter the building, its impact is minimised, structural integrity is maintained, and repair, drying & cleaning and subsequent re-occupation are facilitated.
Resistance	Sometimes known as 'dry-proofing', this relates to how a building is constructed to prevent flood water entering the building or damaging its fabric.
River Basin	See catchment.
Run-off	That proportion of rainfall which is not absorbed into the ground and finds its way, by surface water drainage systems or overland flow, into watercourses and eventually discharges into the sea.

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Term	Definition
Sea level rise	A <i>sea level rise</i> is an increase in the volume of water in the world's oceans, resulting in an increase in global mean <i>sea level</i> . <i>Sea level rise</i> is usually attributed to global climate <i>change</i> by thermal expansion of the water in the oceans and by melting of ice sheets and glaciers on land.
Significant intensification	A proposal that exposes significantly more people to flood risk than the present use of the site. As a general rule, proposals should be equal or less vulnerable than the existing land use. Typical examples of significant intensification are replacing a single dwelling with ten apartments or conversion of commercial/industrial premises to housing. As there is no precise definition or quantification of significant intensification, the Council should determine each application on its individual merits taking account of the scope for mitigation of the residual flood risk.
Storm surge	The increase in sea level caused by the combined effects of low atmospheric pressure and wind.
Storm water	Surface water in abnormal quantities resulting from heavy falls of rain or snow. Storm water that does not infiltrate into the ground becomes surface runoff.
Surface water flooding	Surface water flooding is caused when the volume of rainwater falling does not drain away through the existing drainage systems or soak into the ground, but lies on or flows over the ground instead. This type of flooding is usually short lived and associated with heavy downpours of rain, thunder storms etc.
Sustainable Drainage Systems (SuDS)	A form of drainage that aims to control run-off as close to its source as possible using a sequence of management practices and control structures designed to drain surface water in a more sustainable fashion than some conventional techniques such as storm water networks.
Undefended Area	An 'Undefended Area' is an area within the flood plain that is not protected by flood defences. This applies to the vast majority of fluvial and coastal flood plains. Undefended areas are at much higher flood risk than defended areas, although the flooded areas are usually more predictable and flood water usually recedes more quickly.
Vulnerable groups	Vulnerable groups include children under the age of 18 years old, the elderly and those with limited mobility and/or special needs. Flood warning and evacuation procedures may be difficult to implement for people with disabilities or those whose mobility is otherwise impaired, therefore their risks of injury or fatality are somewhat greater than for the general population. Accordingly, because of the residual flood risk, there should be a presumption against permission being granted for development associated with vulnerable groups. This includes facilities such as children's nurseries, schools, residential care / nursing homes, sheltered housing and hospitals. This list is not exhaustive.

