

LETTERKENNY LOCAL AREA PLAN

Strategic Flood Risk Assessment



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Strategic Flood Risk
Assessment for Letterkenny
Local Area Plan
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REPORT

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- Appendix A Letterkenny LAP Zoning and Flood Zones
- Appendix B Justification Tests

1 INTRODUCTION

1.1 Report Objectives

The objective of this report is to prepare a SFRA for the Letterkenny Local Area Plan. The Report was prepared in accordance with the requirements of The Planning System and Flood Risk Assessment Guidelines for Planning Authorities (2009) Circular PL02/2014 (August 2014) (referred to hereafter as 'The Guidelines'). In line with Guidelines the SFRA must appraise the adequacy of the information available and scope the additional information, analysis and mapping to provide a full picture of flood risk. In this regard it will be required to undertake a full assessment of the existing information in relation to fluvial and coastal flood risk and appraise where this may need to be updated and/or additional detail added.

The SFRA provides an assessment of all types of flood risk within the Letterkenny and provides assistance to Donegal County Council (DCC) to make informed strategic land-use planning decisions and formulate flood risk policies. A Stage 1 Flood Risk Identification was undertaken to identify any flooding or surface water management issues related to Letterkenny that may warrant further investigation. As part of this stage the best available data at the time of preparation was acquired from the Office of Public Works (OPW) North Western Catchment Flood Risk Assessment Management (CFRAM) Study. The North Western CFRAM has generated flood zone mapping which has been deemed suitable as a Stage 2 Initial Flood Risk Assessment. The SFRA examines the Flood Zones A, B and C identified in the North Western/Neagh Bann CFRAMs study with respect to the management of flood risk for development in respect of the Letterkenny land use zoning map. This flood risk information has enabled DCC to apply 'The Guidelines' sequential approach, and where necessary the Justification Test, to appraise sites for suitable land zonings and identify how flood risk can be managed as part of the development plan. Appendix B outlines the approach undertaken by DCC in application of the sequential approach and details the Justification Tests where necessary.

1.2 DISCLAIMER

The SFRA has been prepared in compliance with the Guidelines but the SFRA remains a living document and is based on the best available data at the time of preparation. It is subject to change based on more up to date and relevant flood risk information becoming available during the lifetime of the Development Plan. All information in relation to flood risk is provided for general policy guidance only. All landowners and developers are instructed that Donegal County Council and their consultants can accept no responsibility for losses or damages arising due to assessments of the vulnerability to flooding of lands, uses and developments. Furthermore owners, users and developers are advised to take all reasonable measures to assess the vulnerability to flooding of lands in which they have an interest prior to making planning or development decisions.

It should be noted that the North Western CFRAM mapping used to define the flood zones for this SFRA is the most comprehensive flood zone mapping available for the county and is considered appropriate for use as a strategic overview of flood risk within Letterkenny. Further information on the North Western CFRAM study is available at www.cfram.ie. The flood maps are 'predictive' flood maps, as they provide predicted flood extent and other information for a flood event that has an estimated probability of occurrence (the 1% AEP and 0.1% AEP events – see section 3.2.3 below), rather than information for floods that have occurred in the past.

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1.3 REPORT STRUCTURE

The Letterkenny Local Area Plan Study area and its primary watercourses are identified in Section 2. A summary of the Planning System and Flood Risk Management Guidelines and the procedure for undertaking a SFRA is presented in Section 3. Section 4 outlines a broad overview of the requirements of Flood Risk Assessments (FRA) which should accompany planning applications. The available flood risk information used to identify the flood risk zones is discussed in Section 5. Potential zoning areas at risk from flooding are examined and recommendations for Flood Risk Assessments are made in Section 7. Section 7 details the flood risk management policies, suitable land zonings and identify how flood risk can be managed as part of the development plan. Appendix B outlines the approach undertaken by DCC in application of the sequential approach and details the Justification Tests where necessary.

2 STUDY AREA

2.1 INTRODUCTION

Project Ireland 2040 National Planning Framework, published in July 2018, is the primary articulation of spatial, planning and land use policy within Ireland.

The framework recognises the importance of the Northern and Western Region and justifies a particular focus in the Framework. This was due to the lower level of urbanisation compared to other regions, proximity to the border and the risk posed by Brexit.

Specifically in relation to Donegal the Framework acknowledges that the region is spatially unique due to its extensive coastline but also the relationship to Northern Ireland. In addition to enhancing the connectivity for the regional area the framework supports the enabling of growth and competitiveness to support the strong links that existing between Letterkenny and environs and Northern Ireland.

The Letterkenny Local Area Plan administrative area is shown Figure 2.1. The LAP area has an extent of approximately 223 km². The Town has a population of 19,264 based on the latest census data (2016). The preferred strategic direction of the town includes a strategic growth proposition that would cater for Letterkenny to grow to a future city of +35,000 and be a regional economic driver in the North West City Region

2.2 WATERCOURSES

The Letterkenny Area Further Assessment (AFA) in the North Western CFRAMs is located at the top of Lough Swilly and is made up of the lower reaches of the River Swilly and a number of tributaries that flow into River / Lough Swilly through the Letterkenny AFA including the Sprack and Coravaddy Burns and the Knocknamona watercourse. The Swilly River catchment is fairly mixed in land coverage with forested land (23%), pasture (38%), peat bog (35%) and urban area (4%) due to Letterkenny. The modelled tributaries which enter the Swilly emanate from the hills surrounding Letterkenny to the north and south and some pick up a significant amount of urban drainage along the way to their discharge points into the Swilly.

The extents of model developed for the Letterkenny AFA extended upstream so as to include the New Mills gauging station (39001 - OPW) on the River Swilly upstream of Letterkenny. The modelled catchments are shown in Figure 2.2.

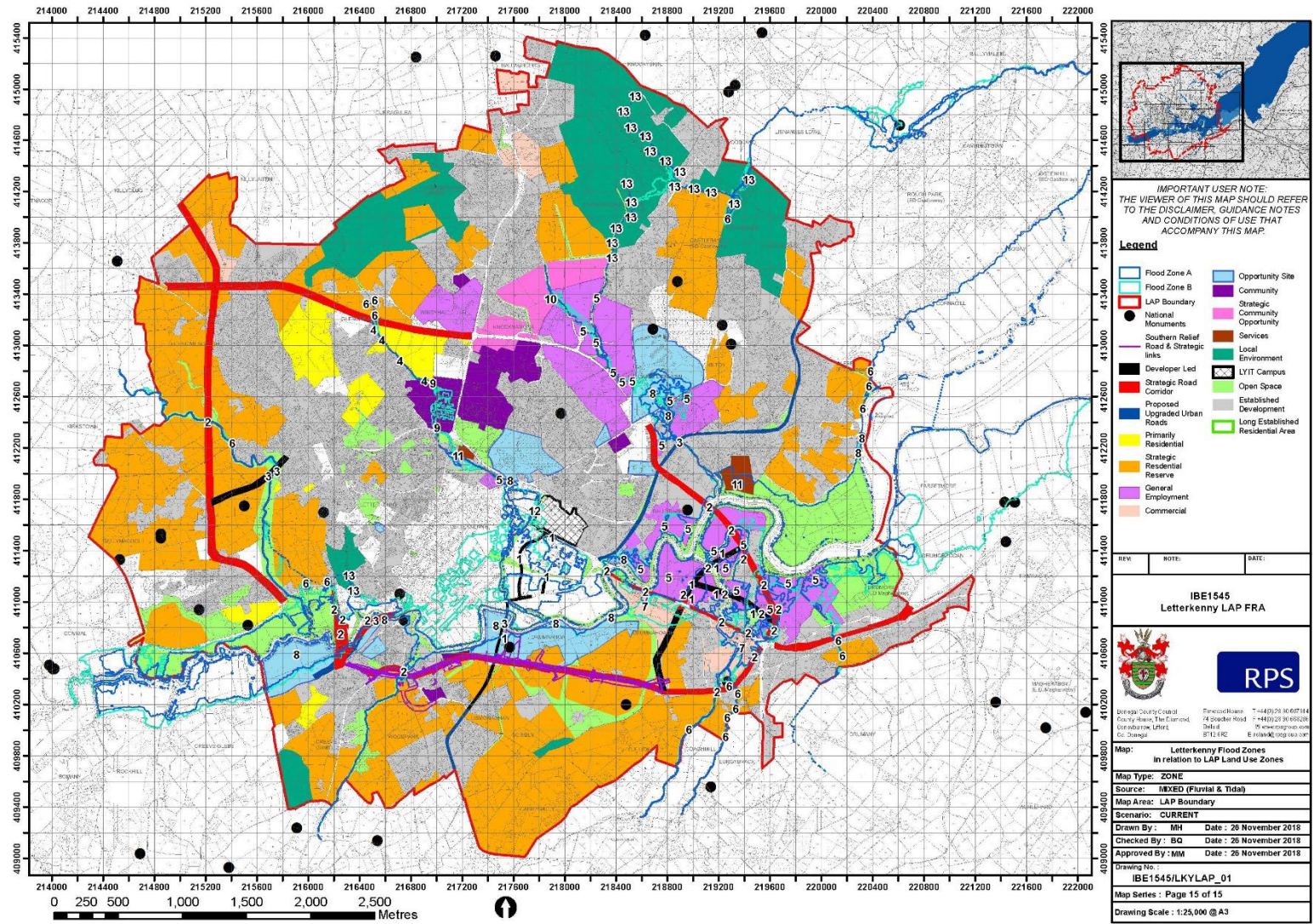


Figure 2-1: Land use zonings for Letterkenny as contained in the County Donegal Development Plan 2018-2024 overlaid with Flood Zones A and B

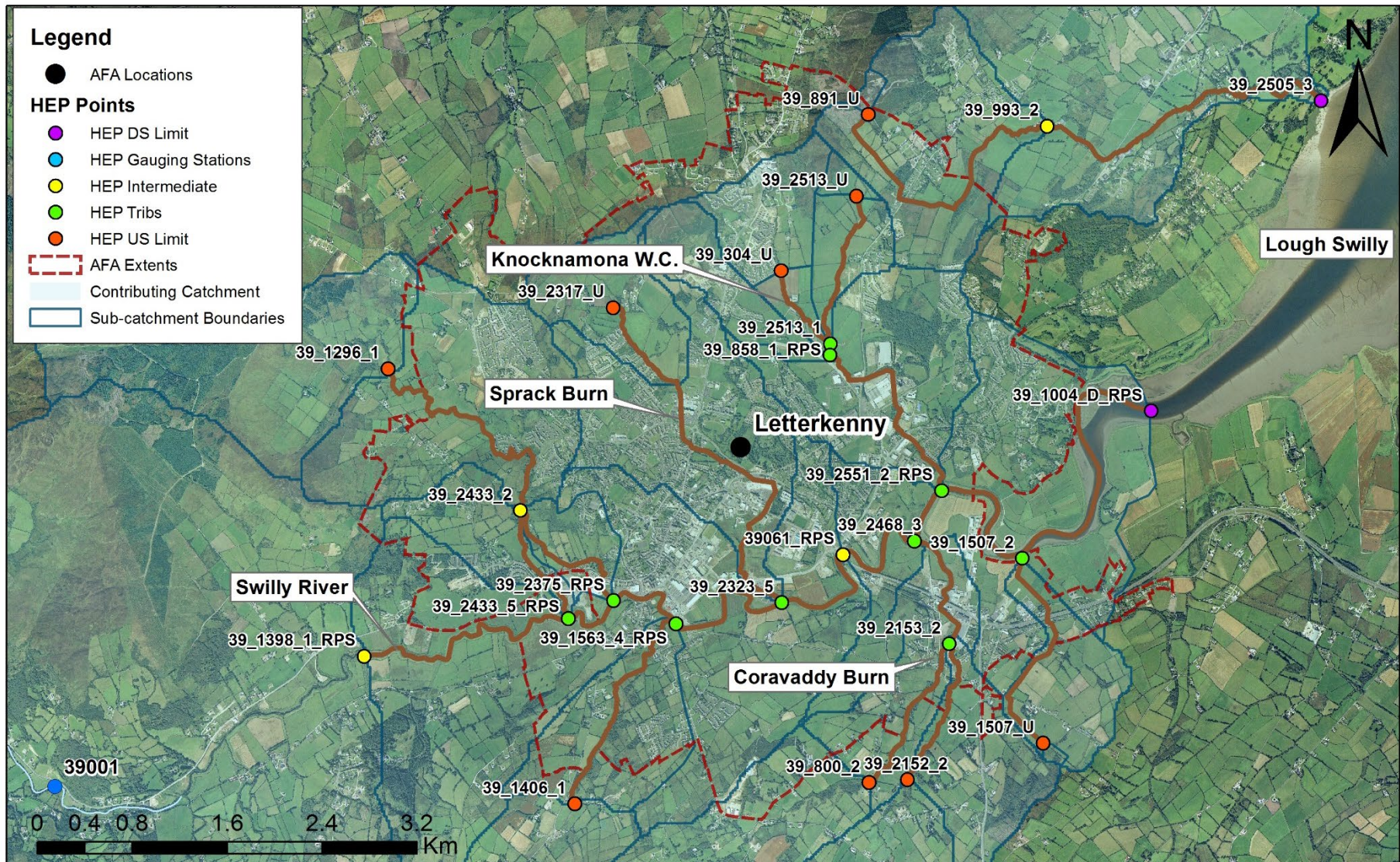


Figure 2-2: Water courses and CFRAM model extents

3 THE PLANNING SYSTEM AND FLOOD RISK MANAGEMENT GUIDELINES FOR PLANNING AUTHORITIES

3.1 INTRODUCTION

In 2009 the Department of Environment, Heritage and Local Government in conjunction with the Office of Public Works published The Planning System and Flood Risk Management: Guidelines for Planning Authorities. The purpose of the Guidelines is to ensure that flood risk is considered by all levels of government when preparing development plans and planning guidelines. They should also be used by developers when addressing flood risk in development proposals. The Guidelines should be implemented in conjunction with the relevant flooding and water quality EU Directives including the Water Framework Directive (River Basin Management Plans (RBMPs)) and the Floods Directive (Catchment Flood Risk Assessment and Management Studies (CFRAMS)).

The core objectives of the Guidelines are to:

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

The Guidelines recommend that Flood Risk Assessments (FRA) be carried out to identify the risk of flooding to land, property and people. FRAs should be carried out at different scales by government organisations, local authorities and for proposed developments appropriate to the level of information required to implement the core objectives of the Guidelines. The FRA scales are:

- **Regional Flood Risk Appraisal (RFRA)** – a broad overview of flood risk issues across a region to influence spatial allocations for growth in housing and employment as well as to identify where flood risk management measures may be required at a regional level to support the proposed growth. Currently being undertaken by the OPW through the CFRAMs process.
- **Strategic Flood Risk Assessment (SFRA)** – an assessment of all types of flood risk informing land use planning decisions. This will enable the Planning Authority to allocate appropriate sites for development, whilst identifying opportunities for reducing flood risk. This SFRA will revisit and develop the flood risk identification undertaken in the RFRA, and give consideration to a range of potential sources of flooding. An initial flood risk assessment, based on the identification of Flood Zones, will also be carried out for those areas, which will be zoned for development. Where the initial flood risk assessment highlights the potential for a significant level of flood risk, or there is conflict with the proposed vulnerability of development, then further assessment to an appropriate level of detail may be required, which may necessitate a more detailed flood risk assessment.
- **Site Specific Flood Risk Assessment (FRA)** – site or project specific flood risk assessment to consider all types of flood risk associated with the site and propose appropriate site management and mitigation measures to reduce flood risk.

3.2 FLOOD RISK ASSESSMENT

3.2.1 Flood Risk Assessment Approach

The Guidelines recommend that Flood Risk Assessments (FRA) be carried out to identify the risk of flooding to land, property and people. FRAs should use the Source-Pathway-Receptor (S-P-R) Model to identify the sources of flooding, the flow paths of the floodwaters and the people and assets impacted by the flooding. Figure 3.1 shows the SPR model that should be adopted in FRAs.

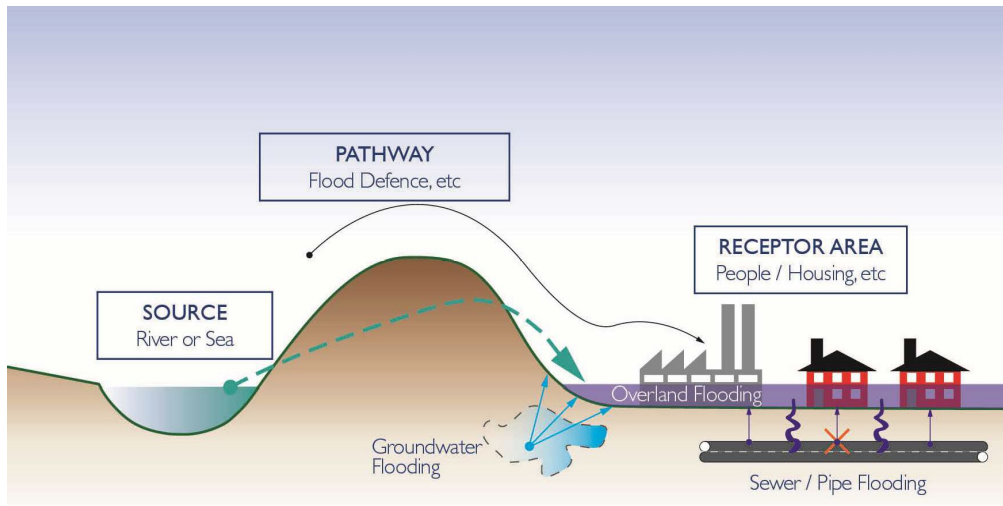


Figure 3-1: Flood Risk Assessment Source – Pathway – Receptor Model

FRAs should be carried out using the following staged approach;

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

3.2.2 Types of Flooding

There are two main sources of flooding inland and coastal. Inland flooding is caused by prolonged and/or intense rainfall. This results in fluvial, pluvial, coastal or ground water flooding acting independently or in combination.

- Fluvial flooding occurs when a river overtops its banks due to a blockage in the channel or the channel capacity is exceeded. A combination of high flow in rivers and a high tide may prevent the river from discharging into the sea thus increasing water levels inland causing rivers to overtop their banks.

- Pluvial flooding occurs when overland flow cannot infiltrate into the ground, when drainage systems exceed their capacity or are blocked and when and when the water cannot discharge due to a high water level in the receiving watercourse.
- Groundwater flooding occurs when the level of water stored in the ground rises as a result of prolonged rainfall to meet the ground surface and flows out over it.
- Coastal flooding occurs when sea levels along the coast or in estuaries exceed neighbouring land levels, or overcome coastal defences where these exist, or when waves overtop the coastline or coastal defences

3.2.3 Flood Risk

Guidelines state flood risk is a combination of the likelihood of flooding and the potential consequences arising. Flood risk is expressed as:

$\text{Flood risk} = \text{Likelihood of flooding} \times \text{Consequences of flooding}$
--

The Guidelines define the likelihood of flooding as the percentage probability of a flood of a given magnitude as occurring or being exceeded in any given year. A 1% probability indicates the severity of a flood that is expected to be exceeded on average once in 100 years, i.e. it has a 1 in 100 (1%) chance of occurring in any one year. Table 3.1 shows flood event probabilities used in flood risk management.

Table 3.1: Flood Event Probabilities

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

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

3.3 FLOOD ZONES

The Guidelines recommend identifying flood zones which show the extent of flooding for a range flood event probabilities. The Guidelines identify three levels of flood zones:

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

The flood zones are generated without the inclusion of climate change factors. The flood zones only account for inland and coastal flooding. They should not be used to suggest that any areas are free from flood risk as they do not account for potential flooding from pluvial and groundwater flooding. Similarly flood defences should be ignored in determining flood zones as defended areas are still carry a residual risk of flooding from overtopping, failure of the defences and deterioration due to lack of maintenance. Figure 3.2 shows a typical flood zone map.

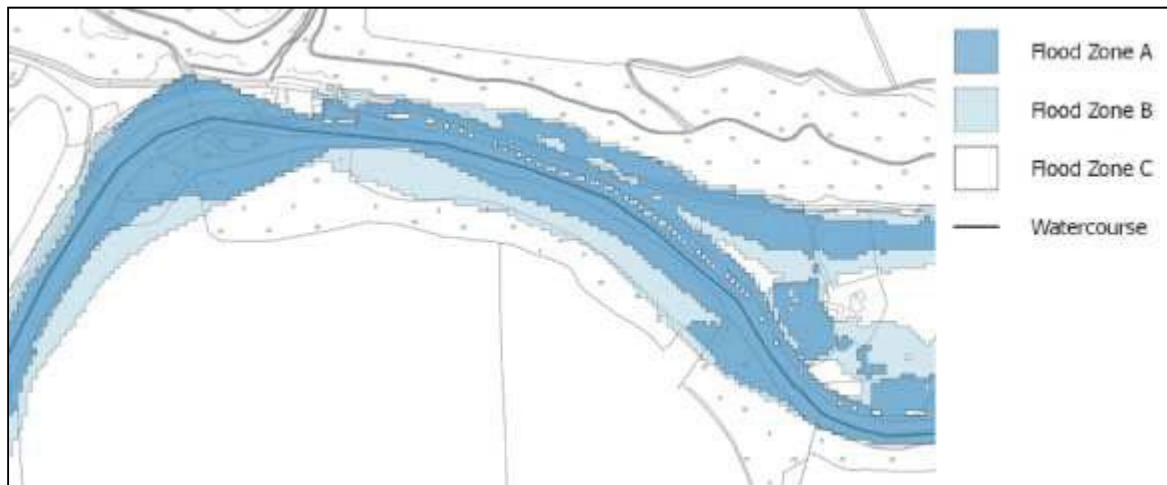


Figure 3-2: Typical Flood Zone Map

3.4 CLIMATE CHANGE

Climate Change is expected to increase flood risk. It could lead to more frequent flooding and increase the depth and extent of flooding. Due to the uncertainty surrounding the potential effects of climate change a precautionary approach is recommended in the Guidelines:

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

3.5 STRATEGIC FLOOD RISK ASSESSMENT (SFRA)

The purpose of this report is to carry out a SFRA at the Local Area Plan scale. The Guidelines recommend a series of outputs for a SFRA. These outputs in broad terms include:

- Identify principal rivers, sources of flooding and produce flood zone maps across the local authority area and in key development areas.
- An appraisal of the availability and adequacy of the existing information.
- Assess potential impacts of climate change to demonstrate the sensitivity of an area to increased flows or sea levels. Where mathematical models are not available climate change flood extents can be assessed by using the Flood Zone B outline as a surrogate for Flood Zone A with allowance for the possible impacts of climate change.
- Identify the location of any flood risk management infrastructure and the areas protected by it and the coverage of flood-warning systems.
- Consider, where additional development in Flood Zone A and B is planned within or adjacent to an existing community at risk, the implications of flood risk on critical infrastructure and services across a wider community-based area and how the emergency planning needs of existing and new development will be managed.
- Identify areas of natural floodplain, which could merit protection to maintain their flood risk management function as well as for reasons of amenity and biodiversity.
- Assess the current condition of flood-defence infrastructure and of likely future policy with regard to its maintenance and upgrade.
- Assess the probability and consequences of overtopping or failure of flood risk management infrastructure, including an appropriate allowance for climate change.
- Assess, in broad terms, the potential impact of additional development on flood risk elsewhere and how any loss of floodplain could be compensated for.
- Assess the risks to the proposed development and its occupants using a range of extreme flood or tidal events.
- Identify areas where site-specific FRA will be required for new development or redevelopment.
- Identify drainage catchments where surface water or pluvial flooding could be exacerbated by new development and develop strategies for its management in areas of significant change.
- Provide guidance on the likely applicability of different Sustainable Drainage Systems (SuDS) techniques for managing surface water run-off at key development sites as determined by surface water and drainage strategies developed within the SFRA.
- Identify where integrated and area based provision of SuDS and green infrastructure are appropriate in order to avoid reliance on individual site by site solutions; and,
- Provide guidance on appropriate development management criteria for zones and sites.

3.6 SEQUENTIAL APPROACH AND JUSTIFICATION TEST

The Guidelines recommend using a sequential approach to planning to ensure the core objectives (as described in Section 3.1) are implemented. Development should be avoided in areas at risk of flooding, where this is not possible, a land use that is less vulnerable to flooding should be considered. If the proposed land use cannot be avoided or substituted a Justification Test must be applied and appropriate sustainable flood risk management proposals should be incorporated into the development proposal. Figure 3.3 shows the sequential approach principles in flood risk management. Table 3.2 and Table 3.3 outline recommendations from the Guidelines for the types of development that would be appropriate to each flood zone and those that would be required to meet the Justification Test.

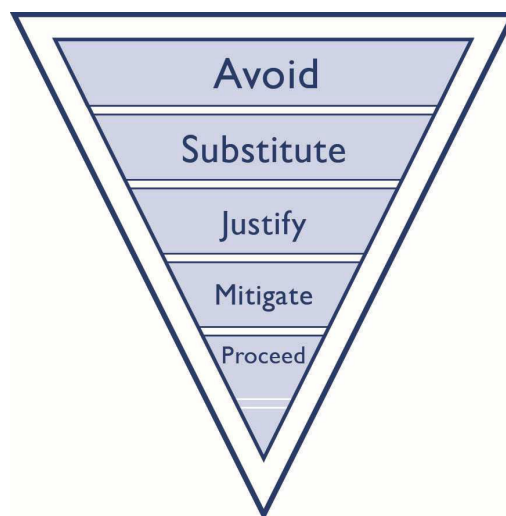


Figure 3-3: Sequential approach principles in flood risk management

Table 3.2: Matrix of vulnerability versus flood zone to illustrate appropriate development and that required to meet the Justification Test.

	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development	Justification Test	Justification Test	Appropriate
Less vulnerable development	Justification Test	Appropriate	Appropriate
Water compatible development	Appropriate	Appropriate	Appropriate

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

Table 3.3: Classification of vulnerability of different types of development

Vulnerability Class	Land uses and types of development which include*:
Highly vulnerable development (including essential infrastructure)	<ul style="list-style-type: none"> • Garda, ambulance and fire stations and command centres required to be operational during flooding; • Hospitals; • Emergency access and egress points; • Schools; • Dwelling houses, student halls of residence and hostels; • Residential institutions such as residential care homes, children’s homes and social services homes; • Caravans and mobile home parks; • Dwelling houses designed, constructed or adapted for the elderly or, other people with impaired mobility; and • Essential infrastructure, such as primary transport and utilities distribution, including electricity generating power stations and sub- stations, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding
Less vulnerable development	<ul style="list-style-type: none"> • Buildings used for: retail, leisure, warehousing, commercial, industrial and non-residential institutions; • Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans; • Land and buildings used for agriculture and forestry • Waste treatment (except landfill and hazardous waste); • Mineral working and processing; and • Local transport infrastructure.
Water-compatible development	<ul style="list-style-type: none"> • Flood control infrastructure; • Docks, marinas and wharves; • Navigation facilities; • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location; • Water-based recreation and tourism (excluding sleeping accommodation); • Lifeguard and coastguard stations; • Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms; and • Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan).

*Uses not listed here should be considered on their own merit

3.7 DEVELOPMENT PLAN JUSTIFICATION TEST

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

Table 3.4: Justification Test for Development Plans

Justification Test for Development Plans
1. The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, and statutory plans as defined above or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act, 2000, as amended.
2. The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular: <ol style="list-style-type: none"> i. Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement; ii. Comprises significant previously developed and/or under-utilised lands; iii. Is within or adjoining the core³ of an established or designated urban settlement; iv. Will be essential in achieving compact and sustainable urban growth; and v. There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.
3. A flood risk assessment to an appropriate level of detail has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process, which demonstrates that flood risk to the development can be adequately managed, and the use or development of the lands will not cause unacceptable adverse impacts elsewhere. N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant flood risk assessment.

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

- Remove the existing zoning for all types of development on the basis of the unacceptable high level of flood risk;
- Reduce the zoned area and change or add zoning categories to reflect the flood risk; and/or
- Replace the existing zoning with a zoning or a specific objective for less vulnerable uses;
- Prepare a local area plan informed by a detailed flood risk assessment to address zoning and development issues in more detail and prior to any development; and/or
- If the criteria of the Justification Test have been met, design of structural or non-structural flood risk management measures as prerequisites to development in specific areas, ensuring that flood hazard and risk to other locations will not be increased or, if practicable, will be reduced. The mitigation measures are required prior to development taking place.

The application of the sequential approach in the preparation of the Development Plan is shown in Appendix B. Land use zonings for Letterkenny as contained in the County Donegal Development Plan 2018-2024 overlaid with Flood Zones A and B are shown in Appendix A in Figure A.1 to Figure A.15.

4 DEVELOPMENT MANAGEMENT AND FLOOD RISK

4.1 OVERVIEW

All development in flood risk areas should be supported by an appropriately detailed Flood Risk Assessment (FRA). The level of detail within the FRA will depend on the risks identified and the proposed land use. Applications should demonstrate the use of the sequential approach in terms of the site layout and design and, in satisfying the Justification Test (where required), the proposal will demonstrate that appropriate mitigation and management measures are put in place. For any development areas that meet the Development Plan Justification Test, a Development Management Justification Test must then be applied. Development must satisfy all of the criteria of the Development Management Justification Test as per Table 4.1 below. Development in flood risk areas can broadly be classified as:

- Existing, developed, zoned areas at risk of flooding
- Undeveloped lands at risk of flooding

This chapter provides a broad overview of the requirements of Flood Risk Assessments which should accompany planning applications. Section 5.10 outlines more specific requirements for areas identified at risk from flooding.

Justification Test for Development Management

Justification Test for Development Management

- The subject lands have been zoned or otherwise designated for the particular use or form of development in an operative development plan, which has been adopted or varied taking account of these Guidelines.
-
- The proposal has been subject to an appropriate flood risk assessment that demonstrates:
 - i. The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk;
 - ii. The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible;
 - iii. The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access; and
 - iv. The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.

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

4.2 SURFACE WATER AND DRAINAGE

All development proposals shall carry out a surface water and drainage assessment and shall ensure that drainage from the site is managed sustainably. The requirements below provide an overview of drainage requirements for development in DCC.

4.2.1 Drainage

The proposed development shall be drained on a completely separate system. All new developments must incorporate Sustainable Drainage Systems (SuDS). In the unlikely event of this not being feasible the Developer must provide alternative means of dealing with pollutants. Rainwater should be infiltrated to the ground and/or discharged via a SuDS system to a surface water drain or watercourse. Other effluent, including wastewater, shall discharge to the foul drainage systems.

- In general, watercourses are not to be culverted or piped. They should remain open in their natural valley, which should be incorporated into the public open space. Culverting should be confined to road crossings and should be sufficiently large to prevent blockage, allow runoff from a one in a hundred rain event and to allow for man entry for maintenance purposes. Permission must be obtained from the OPW (under a section 50 licence) to construct any culvert or bridge.
- All proposed structures must be set back from the edge of any watercourse to allow access for channel cleaning/maintenance. A 15 meters wide riparian buffer strip each side of the watercourse is recommended. In dense urban areas the width of the riparian buffer strip is to be agreed with SDCC.
- All new development must allow for climate.
- River flows 20% increase in flows for all return periods up to 100 years
- Rainfall 10% increase in depth (factor all intensities by 1.1)
- Surface water outfalls to streams, rivers, etc. should be unobtrusive and not cause erosion of the bed and banks. A suitable non-return device should be fitted on the outfall pipeline. DCC must approve all design details.
- Further guidance on the use of SuDS is given in the GDSDS Technical Documents Vol. 2 New Development and Vol. 3 Environmental Management and in the Design and Best Practice manuals produced by CIRIA in the UK.

4.2.2 Storm water management

The maximum permitted surface water outflow from any new development is to be restricted to that of a Greenfield site before any development took place.

- All new development must allow for climate change as set out Section 5.8.
- In general, all new developments must incorporate Sustainable Drainage Systems (SuDS).
- Sustainable Drainage Systems include devices such as: Swales, Permeable Pavements, Filter Drains, Storage Ponds, Constructed Wetlands, Soakaways, etc. SuDS devices such as permeable paving or swales/ ponds etc. may require the approval of SDCC.
- In some exceptional cases it may not be feasible to use the above devices and at the discretion of the DCC, approval may be given to install underground attenuation tanks or enlarged pipes in conjunction with other devices to achieve the required water quality. These should only be considered as a last resort where it can be shown that SuDS measures are not achievable
- Attenuation tanks shall normally be located in green areas; any other location requires the approval from SDCC.
- Where a tank is to be constructed in a trafficked area, a standard minimum depth of cover from road level to top of the roof of the tank should be 1.2m.
- All enlarged pipes and associated manholes must comply with the GDSDS and the Code of Practice.
- In order to isolate and carry out maintenance of the flow control device a penstock valve (or similar approved) shall be installed within the outfall manhole, on the upstream end of the manhole.

- For gravity systems a Hydrobrake (or similar approved flow control device) shall be installed in the last manhole.
- The opening to be large enough to facilitate the extraction of the flow control device.
- An overflow from the flow control manhole to the public drainage network is not allowed.

The key design criteria for development are shown in Table 4.2 but readers are advised to consult the technical document, Greater Dublin Strategic Drainage Study, Volume 2, New Development Policy.

Table 4.1 Key Design Criteria for Storm Water Management for Development

Criteria	Sub-Criterion	Return Period (Years)	Design Objective
Criterion 1: River Water Quality Protection	1.1	< 1	Interception storage of at least 5mm, and preferably 10mm, of rainfall where runoff to the receiving water can be prevented.
	1.2	< 1	Where initial runoff from at least 5mm of rainfall cannot be intercepted, treatment of runoff (treatment volume) is required. Retention pond (if used) is to have minimum pool volume equivalent to 15mm rainfall.
Criterion 2: River Regime Protection	2.1	1	Discharge rate equal to 1-year greenfield site peak runoff rate or 2l/s/ha; whichever is the greater. Site critical duration storm to be used to assess attenuation storage volume.
	2.2	100	Discharge rate equal to 1 in 100 year greenfield site peak runoff rate. Site critical duration storm to be used to assess attenuation storage volume.
Criterion 3: Level of service (Flooding) for the site	3.1	30	No flooding on site except where specifically planned flooding is approved. Summer design storm of 15 or 30 minutes are normally critical.
	3.2	100	No internal property flooding. Planned flood routing and temporary flood storage accommodated on site for short high intensity storms. Site critical duration events.
	3.3	100	No internal property flooding. Floor levels at least 500mm above maximum river level and adjacent on-site storage retention.
	3.4	100	No flooding of adjacent urban areas. Overland flooding managed within the development
Criterion 4: River Flood Protection	4.1	100	“Long-term” floodwater accommodated on site for development runoff volume which is in excess of the greenfield runoff volume. Temporary flood storage drained by infiltration on a designated flooding area brought into operation by extreme events only. 100 year, 6 hour duration storm to be used for assessment of the additional volume of runoff.
	4.2	100	Infiltration storage provided equal in volume to “long- term” storage Usually designed to operate for all events. 100year, 6-hour duration storm to be used for assessment of the additional volume of runoff.
	4.3	100	Maximum discharge rate of QBAR or 2 l/s/ha, whichever is the greater, for all attenuation storage where “long-term” storage cannot be provided.

4.3 RESIDUAL RISK

As well as assessing the surface water management risk for a site, all development including that in Flood Zone C, should consider residual risk factors such as culvert / bridge blockages and the effects of climate change which may expand the extents of Flood Zones A and B. These residual risk factors should influence the potential mitigation measures for a site which could include setting the finished floor levels.

4.4 DEVELOPMENT PROPOSALS IN FLOOD ZONES

4.4.1 Overview

It is recommended that any planning applications in flood risk areas are accompanied by a supporting appropriately detailed flood risk assessment. This is to ensure a conservative approach and that consideration is given to new development within Flood Zones where mitigation measures may still be required to ensure an appropriate level of flood protection and/or resilience. The detailed assessment should include at a minimum Stage 1 - Identification of Flood Risk. Where flood risk is identified a Stage 2 - Initial FRA will be required, and depending on the scale and nature of the risk a Stage 3 - Detailed FRA may be required.

Detailed FRAs should be carried out in accordance with the Guidelines and should present in sufficient detail the potential flood risk to a proposed development, the potential increase in flood risk elsewhere, any proposed mitigation measures and proposals for sustainable surface water management. The FRA should also consider the impacts of climate change, residual risk associated with culvert blockages and freeboard in setting the finished floor levels (FFLs) of new development.

4.4.2 Assessment of Proposals for Minor Development

The Justification Test does not apply to applications for minor development to existing buildings in areas of flood risk such as small extensions and most changes of use. However, a flood risk assessment of appropriate detail should accompany such applications to demonstrate that they would not have adverse flood risk impacts e.g. affect existing watercourses, floodplains or flood relief works. These proposals should follow best practice in the management of health and safety for users and residents of the proposal.

4.4.3 Assessment of Proposals for Highly Vulnerable Development

Highly vulnerable development proposals should not be considered in flood risk areas. Any applications for Highly Vulnerable Development shall be supplemented by an appropriately detailed FRA and meets the criteria of the Development Management Justification Test. The following considerations should be addressed in applications for highly vulnerable development in flood risk areas:

1. The minimum finished floor level for highly vulnerable development should be above the Flood Zone B (0.1% AEP) level plus suitable freeboard. The recommended level of freeboard is 500 mm for fluvial flood levels.
2. Applications should outline the emergency procedures that will be applied in the event of a flood. Evacuation routes should be identified but if this is not possible then containment may be considered if it is considered safe and practical to do so. If either safe evacuation or containment is not possible, then the development proposal should be refused.
3. The site layout should follow the sequential approach to allocate land within a development based on the vulnerability class of the development i.e. more vulnerable development should be placed on higher ground while water compatible development e.g. car parking, greenfield space can be placed in the flood zones.
4. Compensatory storage for development that results in a loss of floodplain within Flood Zone A must be provided on a level for level basis, the lands should be in close proximity to the area that storage is being lost from, the land must be within the ownership of the developer and the land given to

storage must be land which does not flood in the 1% AEP event. Also the compensatory storage area should be constructed before land is raised to facilitate development.

4.4.4 Assessment of Proposals for Less Vulnerable Development

Less vulnerable development proposals should not be considered in Flood Zone A area unless supplemented by an appropriately detailed FRA and meets the criteria of the Development Management Justification Test. The minimum finished floor level for less vulnerable development should be above the Flood Zone A (1% AEP) level plus suitable freeboard. The recommended level of freeboard is 500 mm for fluvial flood levels.

4.4.5 Extension of Duration in Flood Risk Areas

In areas where recent and more up to date flood risk information subsequently finds that a site has a flood risk, applications for extension of duration or new applications within the zoning will require appropriately detailed FRA at development management stage. If the permitted development is found not to conform with the Planning Guidelines then the application should be refused on flood risk grounds and a new application submitted, allowing for appropriate design and a FRA.

5 FLOOD RISK INFORMATION

5.1 INTRODUCTION

There are several sources of relevant flood risk information available for Letterkenny. The information reviewed for the completion of this report is summarised in this section. This information was used to generate the fluvial flood zone maps as shown in Appendix A. Figure 5.1 below shows an overview of the flood zones, whilst Figure 5.2 provides indicative pluvial flooding for the study area.

5.2 HISTORICAL FLOODING

A review of historical flood data was carried out for the North Western CFRAMs using information provided on floodmaps.ie and in consultation with DCC. Where flood extents were provided they were validated and incorporated into the flood zone maps. This includes the significant flooding that occurred in Letterkenny in 2013 and 2014. The main sources of flooding in the county are fluvial and coastal. As illustrated in Figures 5.1 and 5.2 below.

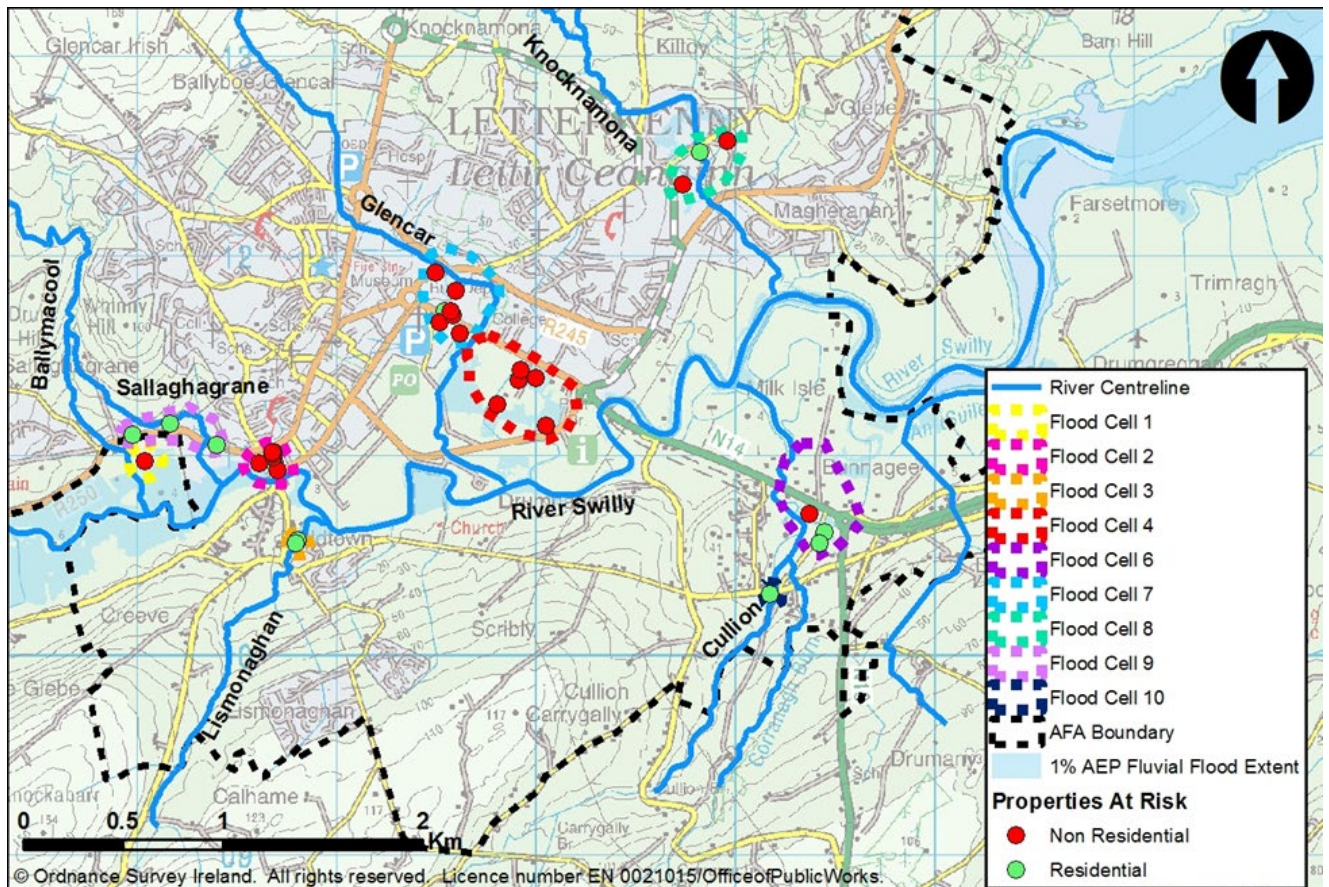


Figure 5-1: Fluvial Flood Risk

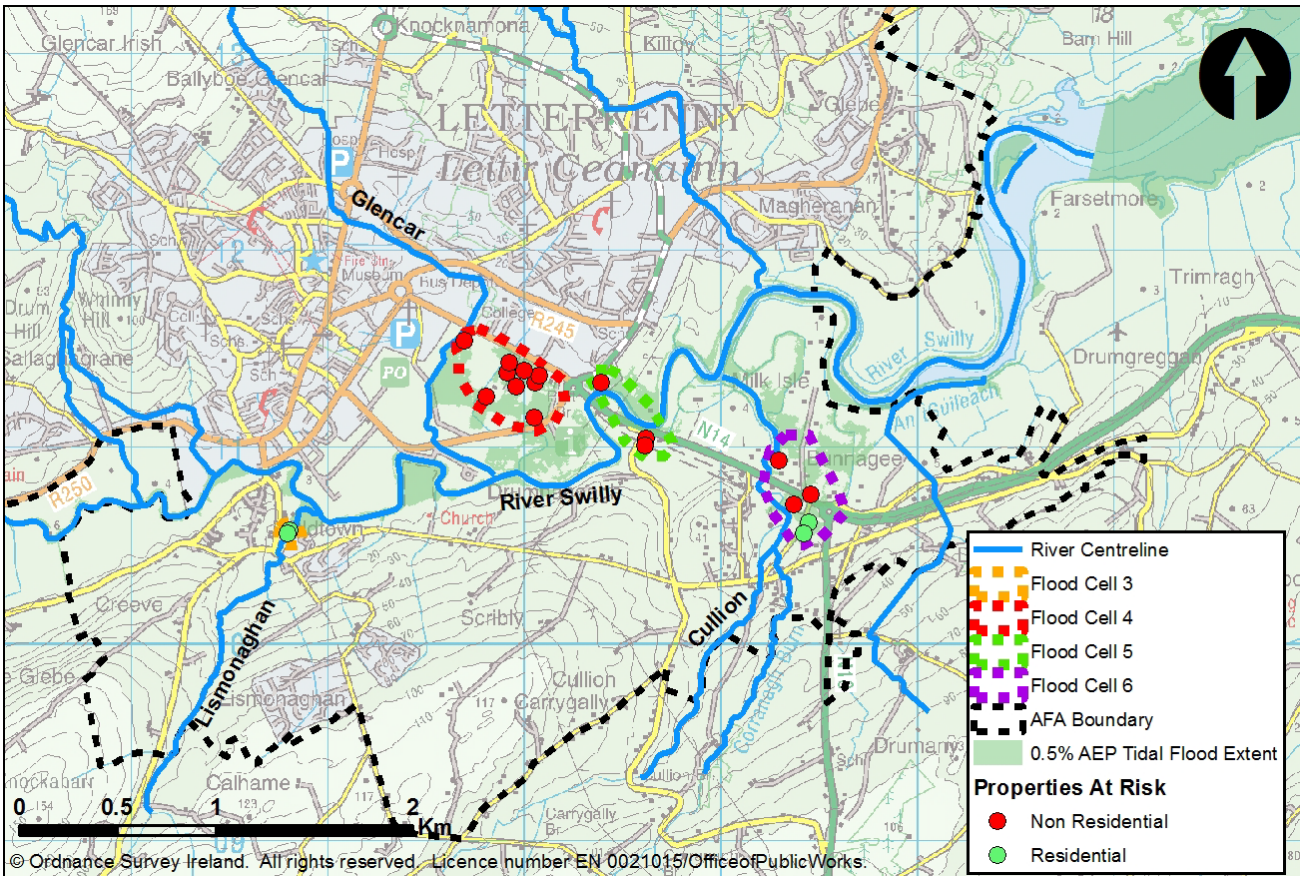


Figure 5-2: Coastal Flood Risk

5.3 CFRAM STUDIES

5.3.1 Background

The OPW led the development of Catchment Flood Risk Assessment and Management Studies (CFRAMS) for river basin districts in Ireland. The aim of these studies was to assess flood risk, through the identification of flood hazard areas and the associated impacts of flooding. The flood hazard areas have been identified as being potentially at risk from significant flooding, including areas that have experienced significant flooding in the past. They also take account of issues such as climate change, land use practices and future development. These studies have been developed to meet the requirements of the EU Directive on the assessment and management of flood risks (the Floods Directive). The Floods Directive was transposed into Irish law by SI 122 of 2010 “European Communities (Assessment and Management of Flood Risks) Regulations 2010”.

CFRAMS has resulted in the publication of long-term Flood Risk Management Plans (FRMP) to manage flood risk within the relevant river catchment. Flood maps are one of the main outputs of the studies. The maps indicate modelled flood extents for flood events of a range of annual exceedance probability (AEP).

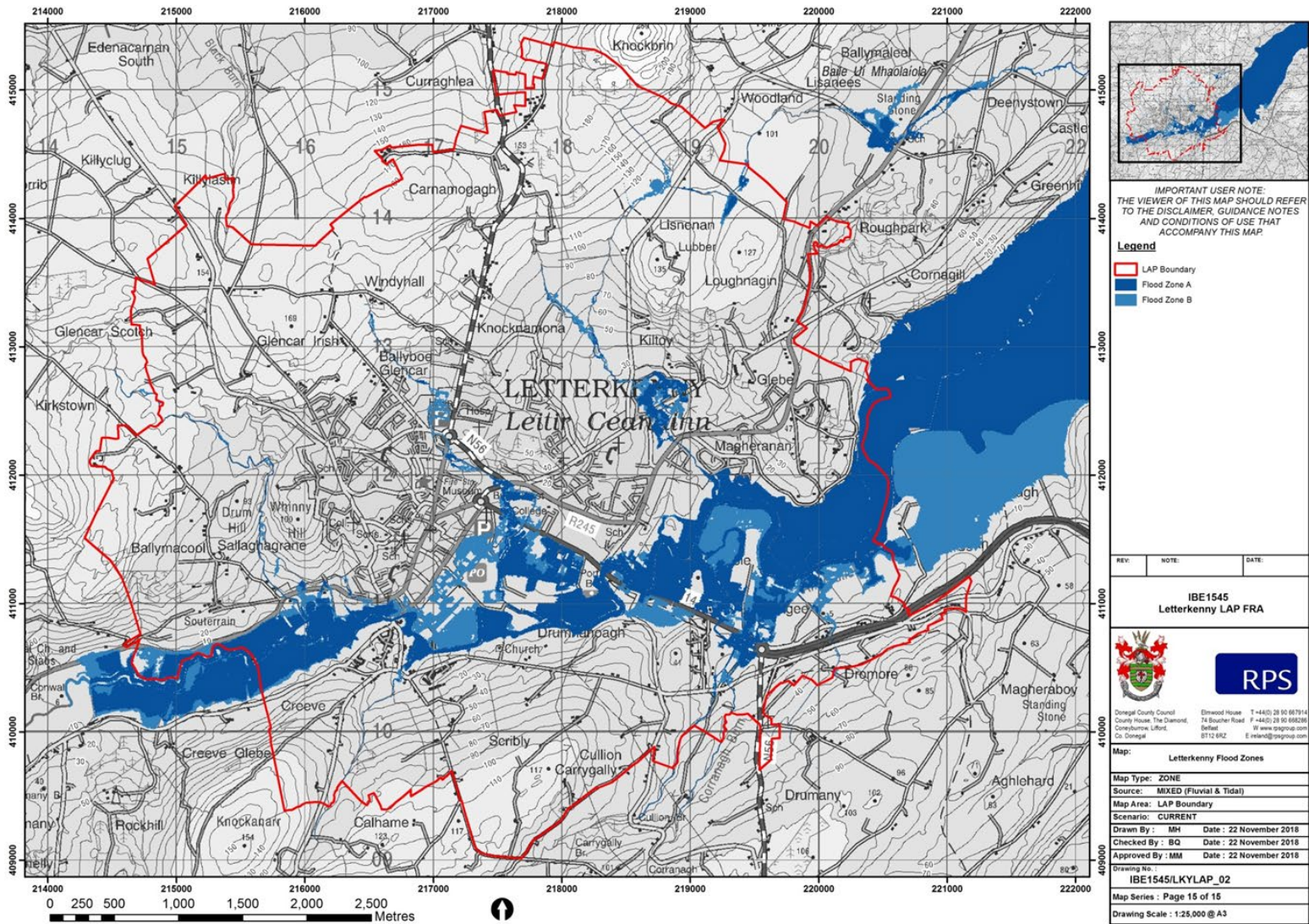


Figure 5-3: CFRAM Flood Zones in Letterkenny, Co Donegal

5.3.2 Flood Risk Management Plans

The North Western (UoM01) Flood Risk Management Plan (2017-2021), which includes the Letterkenny Area for further Assessment (AFA) is complete and its recommendations are discussed in Section 7.3.

5.3.3 CFRAM Flood Zone Mapping

All the principal watercourses and notable streams (as shown in Figure 2.1) are accounted for within The North Western (UoM01) Flood Risk Management Plan (2017-2021) and associated flood extent mapping has been produced. The mapping takes into account historical flood risk information (Section 5.2).

The CFRAM mapping is the most comprehensive flood zone mapping available for the county and is considered appropriate for use as a strategic overview of flood risk within the LAP.

5.4 FLOOD DEFENCE WORKS

5.4.1 Flood Zone Mapping for Flood Defence Schemes

The Guidelines state that the effect of formal flood defences should be ignored when determining flood zones as defended areas still carry a residual risk from overtopping and failure of the defences. Because this residual risk of flooding remains, the sequential approach and the Justification Test apply to such defended locations.

In the CFRAM Studies flood defences were defined as structures or features that were constructed to provide a formal flood defence function ('formal flood defences'), including those that may be in poor condition, and also those that may have been built for other purposes but that, in the opinion of a Consultant, would provide a flood defence function ('informal effective flood defences'). They do NOT include structures that were not constructed to provide a formal flood defence function and that, in the opinion a Consultant, would fail to provide a flood defence function due to structural weakness, porosity or other such reasons ('informal ineffective flood defences'), such as garden walls or embankments perforated by uncontrolled culverts.

The best available information regarding flood zones is the CFRAM flood mapping. The flood mapping has incorporated the effect of formal flood defences within the flood zones.

Letterkenny has existing defences which are part of the Lough Swilly embankments which extend for a distance of over 45 kms as identified in the North Western CFRAM. These assets are considered as non- Area Potential Significant Risk (APSR) defence assets as their primary function is not for formal flood defence.

5.5 OPW PRELIMINARY FLOOD RISK ASSESSMENT INDICATIVE FLUVIAL FLOOD MAPS

The Preliminary Flood Risk Assessment (PFRA) is a national screening exercise completed by the OPW in 2012 based on available and readily-derivable information. The PFRA aimed to identify areas where there may be a significant risk associated with flooding. Indicative fluvial flood maps were produced to help identify these areas. The mapping did not account for flood defences, channel structures or channel works. Areas where the risks associated with flooding might be significant were identified and are referred to as Areas for Further Assessment, or 'AFAs'. More detailed assessment of the AFA's was undertaken through the CFRAM Studies to more accurately assess the extent and degree of flood risk, and, where the risk is significant, to develop where possible measures to manage and reduce the risk.

The North Western CFRAM study includes Letterkenny as an AFA and therefore the flood mapping provided for in the FRMP is more detailed than the PFRA flood mapping and is considered adequate to accurately assess the extent and degree of flood risk at a strategic level.

5.6 SFRA FLUVIAL FLOOD ZONE MAPPING SUMMARY

The flood zones presented in this report are derived from the Final North Western CFRAM maps. These maps are the most comprehensive flood maps produced for Letterkenny since the introduction of the Guidelines and the Floods Directive. The flood extents for Letterkenny are incorporated into the CFRAMs mapping and therefore there was no need to supplement mapping from the earlier OPW Preliminary Flood Risk Assessment (PFRA) Report. The flood zones account for inland and coastal flooding.

5.7 OTHER SOURCES OF FLOODING

5.7.1 Overview

The flood zones only account for inland flooding. However they should not be used to suggest that any areas are free from flood risk as they do not account for potential flooding from other sources. Hence a review of other sources of flooding was carried out to identify potential areas of risk.

5.7.2 Ground Water Flooding

The OPW Preliminary Flood Risk Assessments Groundwater Flooding Report concludes that ground water flooding is largely confined to the West Coast of Ireland due to the hydrogeology of the area. Figure 5.4 below shows that ground water flooding is not a risk for South Dublin County.

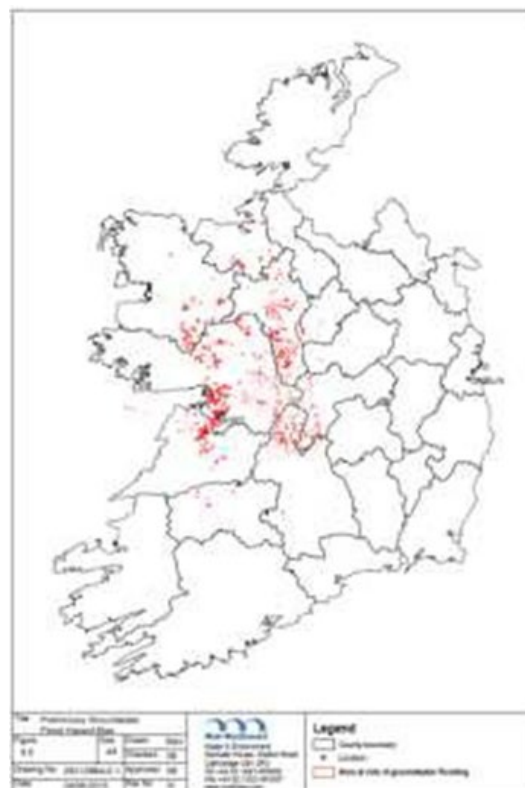


Figure 5-4: OPW Preliminary Flood Risk Assessments Groundwater Flooding Hazard Map

5.7.3 Pluvial Flooding

5.7.3.1 Pluvial Modelling

The pluvial modelling phase of the project required definition of the flood risk to Letterkenny from rainfall, using the best available information and methodologies as far as is reasonably practicable.

5.7.3.2 Model Representation

The 2D model is comprised of a mesh zone created using the 2m DTM, with a minimum element area set to 5m² and a maximum triangle area set to 200m². Terrain-sensitive meshing was switched on to allow the model to calculate area as required depending on terrain therefore providing highly detailed outputs. Defined urban and rural zones were incorporated into the model, created using national Corine datasets, with manual updates made to reflect recent developments and boundaries were simplified in GIS to aid model effectiveness. These urban and rural zones were used to generate rainfall boundaries and the boundaries defined two separate zones for the application of separate rainfall profiles. An infiltration zone was applied to the rural area, with a value of 0.9 for 10% infiltration, to represent permeable ground materials. Figure 5.5 below shows a representation of the ICM model set-up.

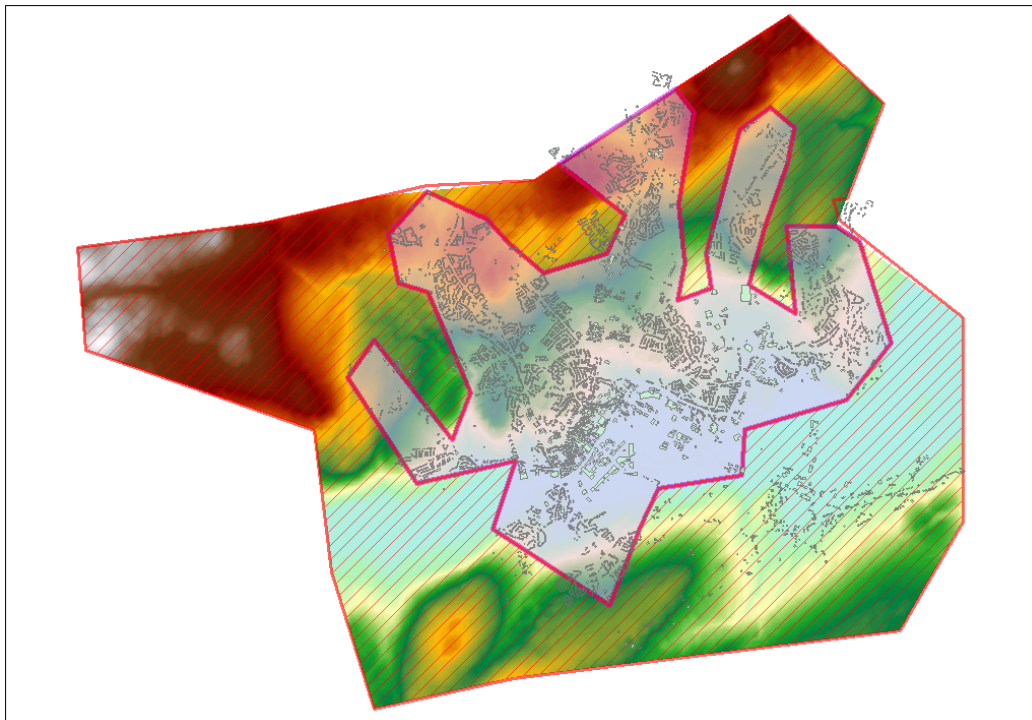


Figure 5-5: Representation of ICM model set-up

Figure 5.6 illustrates the pluvial extent map for a 120 minute duration storm over a range of return periods.

The maps can be used to identify areas that may be at risk and that may require a pluvial flooding assessment to be carried out for planning applications. Recommendations and guidelines in relation to SuDs should be implemented in these areas to reduce the risk of pluvial flooding.

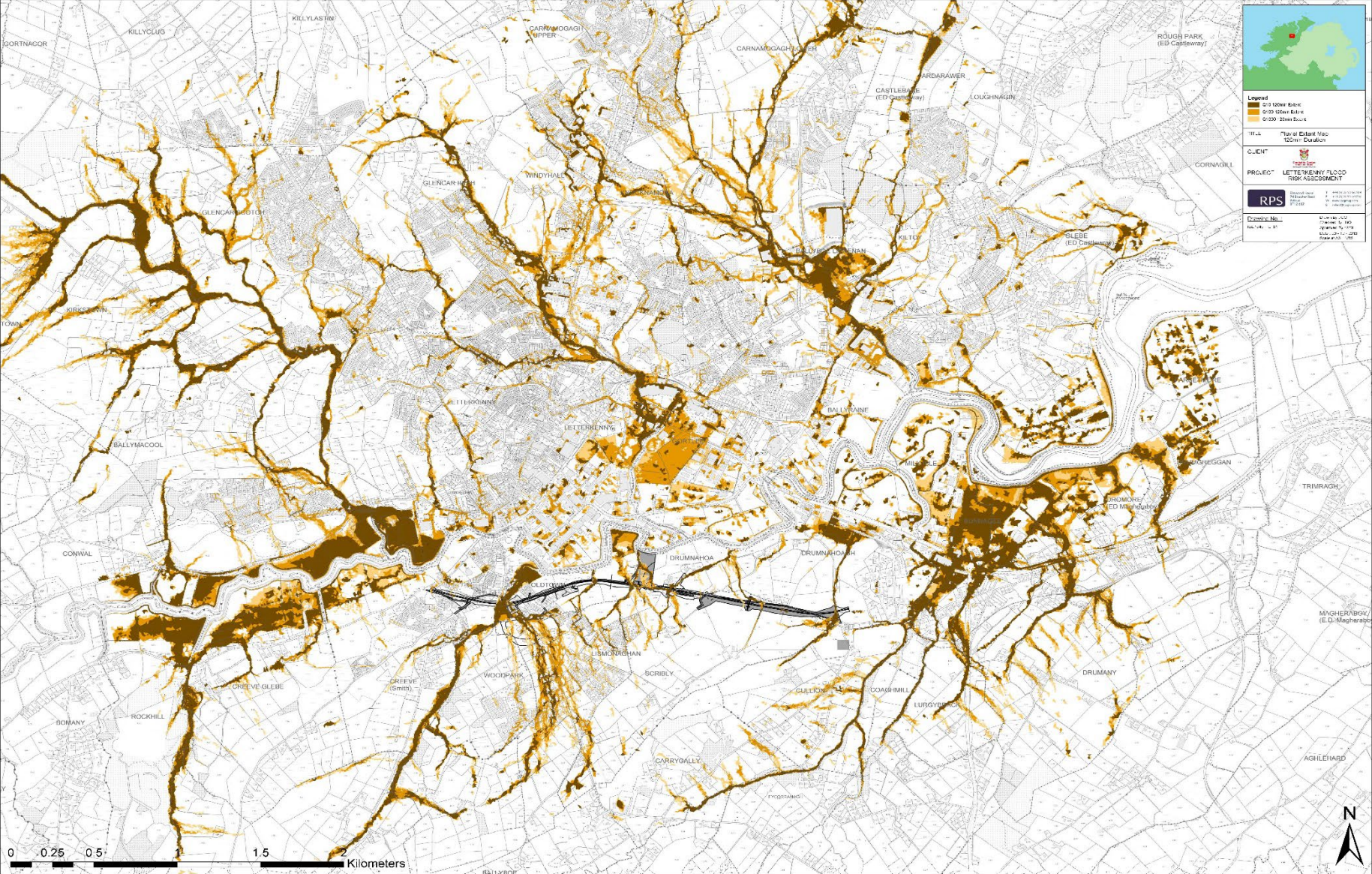


Figure 5-6: Pluvial extent map for a 120 minute duration storm over a range of return periods

5.8 CLIMATE CHANGE SENSITIVE AREAS

The flood zones are generated without the inclusion of climate change factors. Due to the uncertainty surrounding the potential effects of climate change a precautionary approach is recommended. Areas that are potentially sensitive to climate change were reviewed from the North western CFRAMs and the mapping available on floodinfo.ie. Letterkenny AFA is considered to be at high vulnerability from the mid-range future scenario (MRFS) and high vulnerability from the high end future scenario (HEFS). Detailed flood risk assessment and adaptation of the preferred flood relief measures would require consideration of the impacts from climate change at the planning stages of development.

6 DEVELOPMENT PLAN ZONING

6.1 INTRODUCTION

The initial SFRA reviewed areas of interest in terms of fluvial and coastal flood zones, historical flooding spots and indicative pluvial flooding mapping. The flood zones are derived from the Final North Western CFRAM maps within which Letterkenny was identified as an AFA and therefore had detailed assessment of the flood risk undertaken. As described in Section 5.3. The CFRAM mapping is the most comprehensive flood zone mapping available for the Letterkenny LAP and is considered appropriate for use as a strategic overview of flood risk. The flood zone maps are shown in Appendix A.

This flood risk information has enabled DCC to apply 'The Guidelines' sequential approach to both zoned and non-zoned land, and where necessary the Justification Test, to appraise sites for suitable land zonings and identify how flood risk can be managed as part of the development plan. Appendix B outlines the approach undertaken by DCC in application of the sequential approach and details the Justification Tests where necessary. The Land use zonings for Letterkenny as contained in the County Donegal Development Plan 2018-2024 overlaid with Flood Zones A and B are shown in Appendix A in Figure A.1 to Figure A15.

Development in flood risk areas can broadly be classified as:

- Existing, developed, zoned areas at risk of flooding
- Undeveloped lands at risk of flooding

6.2 EXISTING, DEVELOPED, ZONED AREAS AT RISK OF FLOODING

The SFRA identifies several areas of existing established development which are at risk of flooding. In accordance with Circular PL2/2014 a Justification Test should be carried out to assess the appropriateness of the existing zoning for existing, developed, zoned areas and proposed areas of regeneration at risk of flooding. If still deemed appropriate the Justification Test should outline flood risk management measures to ensure that flood risk is not increased in the areas and to other adjoining areas. These include existing highly vulnerable development in Flood Zones A and B and existing less vulnerable development in Flood Zone B.

6.2.1 Existing Highly Vulnerable Development

Areas of highly vulnerable development include the existing services of the University Hospital on Kilmacrennan Road, the Fire Station in De Valera Road, the Letterkenny WWTP, the existing Letterkenny Institute of Technology (LYIT) on Port Road and the location of a new school ,Educate Together, (on part of the old UNIFI site). These areas are shown in Figures 6.1 to 6.3 inclusive. It is considered that it would be unrealistic to rezone these lands for less vulnerable uses as they are fully developed. The Guidelines (Section 5.28) state:

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

These areas are already developed and any further applications would involve existing buildings or developed areas the sequential approach cannot be used to locate them in lower risk areas and the justification test does not apply in this case, as highlighted in Section 5.28 of the guidelines.

Therefore DCC has not carried out a justification test for these areas of existing services and education/schools. However a detailed FRA of appropriate detail should accompany applications for development on these sites to demonstrate that they would not have adverse flood risk impacts. Table 7.1 outlines the policy recommendations for flood risk management.

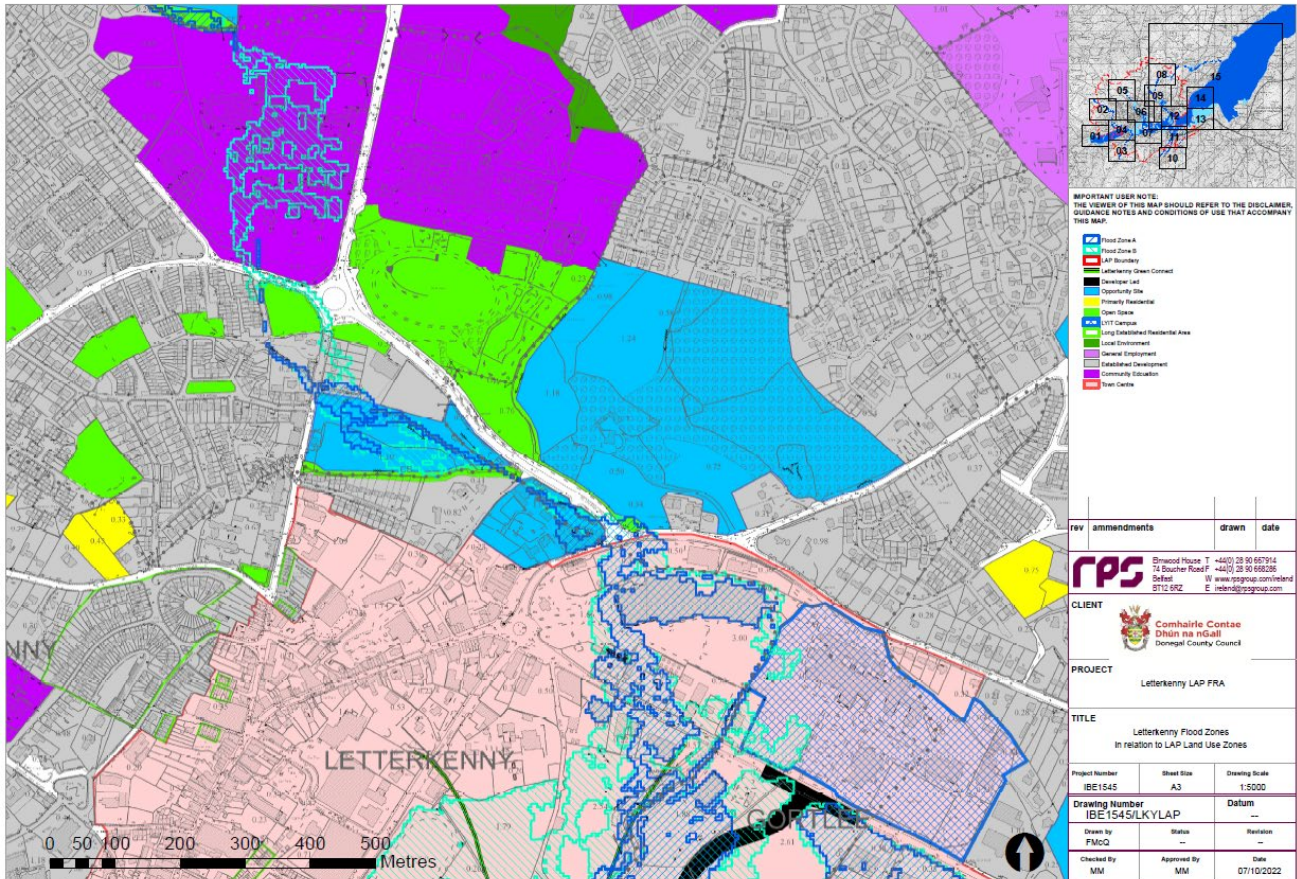


Figure 6-1: Fluvial Flood Zones in at Letterkenny Fire Station and LYIT

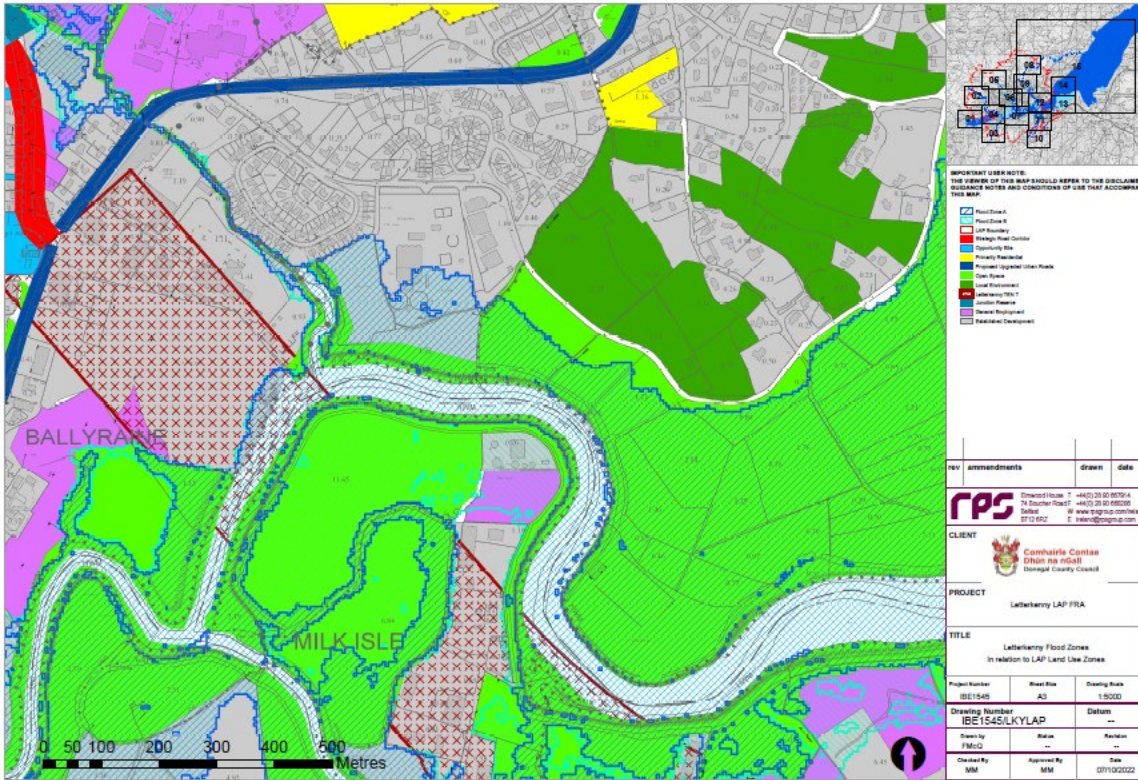


Figure 6-2: Flood zones at Letterkenny WWTP

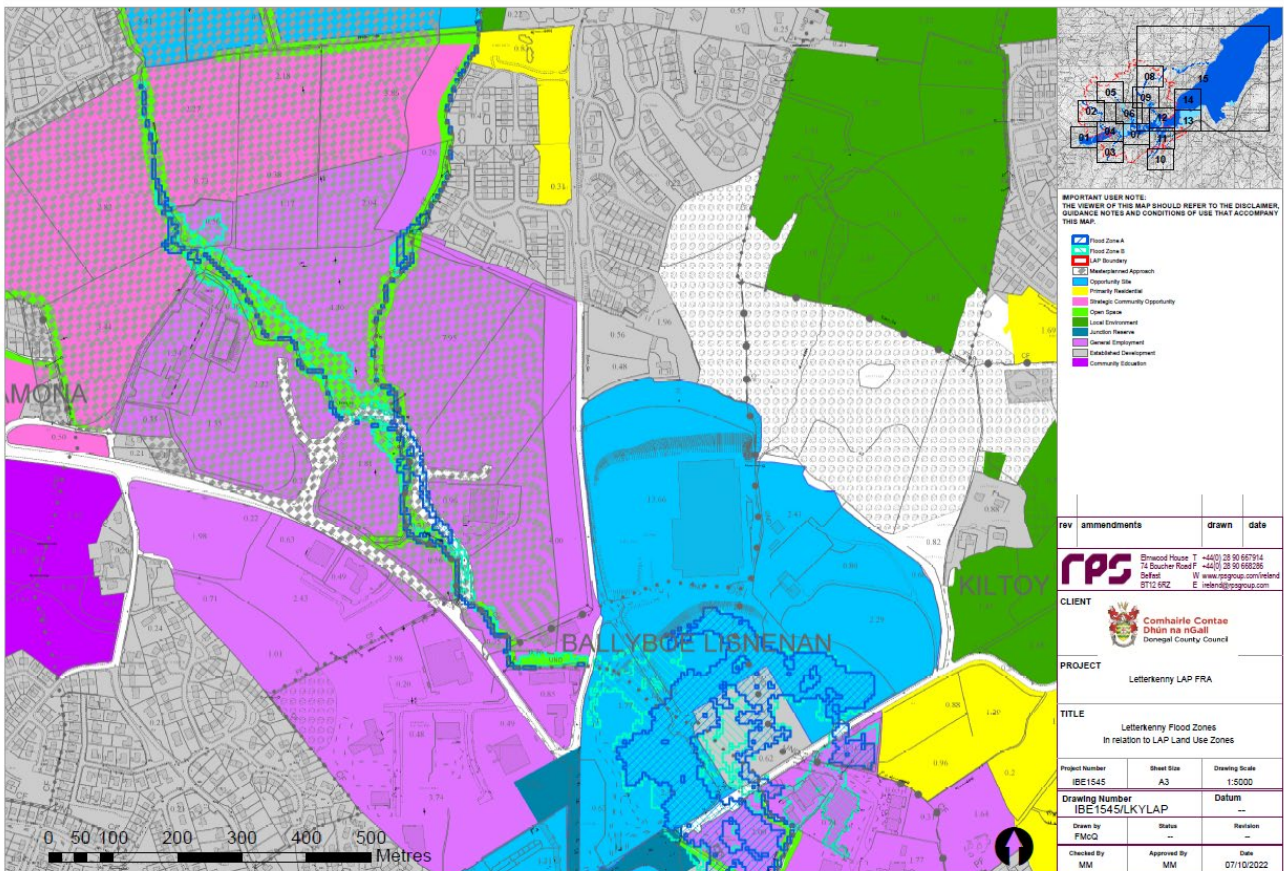


Figure 6-3: Flood Zones at the Educate Together School

6.2.2 Existing Less Vulnerable Development

Areas of less vulnerable development accommodating existing established development include:

- Figure 6.4 - lands adjacent to the Swilly River and opposite the Mount Errigal Hotel and south of Letterkenny Skip Hire. This area is predominantly in use associated with Letterkenny Skip Hire and recycling facility, Donegal County Council pumping station adjacent to the river and a building supplies business located to the public road. Also relates to lands adjoining the river at the Polestar Roundabout where areas of established development located along the roadside edge of the lands (namely a business named 'The Flooring Company' and associated car park, as well as a shed structure located on a concreted yard area and remainder of associated walls and gates). These areas are reasonably to be delineated as 'established' development.
- Figure 6.5- relates to lands at Bonagee and to established development along the four lane carriageway. Flood zones A and B overlap with a number of existing established uses including the Clanree Hotel, Applegreen petrol station and shop, car sales (x2), lighting showroom and a number of residential properties.

It is considered that it would be unrealistic to rezone these lands for water compatible uses as they are fully developed. As outlined above and in Section 5.28 of the Guidelines the sequential approach is not possible in these situations and the justification test does not apply. Therefore DCC has not carried out a justification test for these areas but rather has zoned these areas as established development. However a commensurate assessment of the risks of flooding will have to accompany any applications for small scale infill, small extensions to houses or the rebuilding of houses, and most changes of use of existing buildings and or extensions and additions to existing commercial and industrial enterprises. This is required to demonstrate that they would not have adverse impacts or impede access to a watercourse, floodplain or flood Zones protection and management facilities. Therefore a FRA of appropriate detail should accompany applications for development on these sites to demonstrate that they would not have adverse flood risk impacts. Table 7.1 outlines recommendations for The FRAs and County Development Plan.

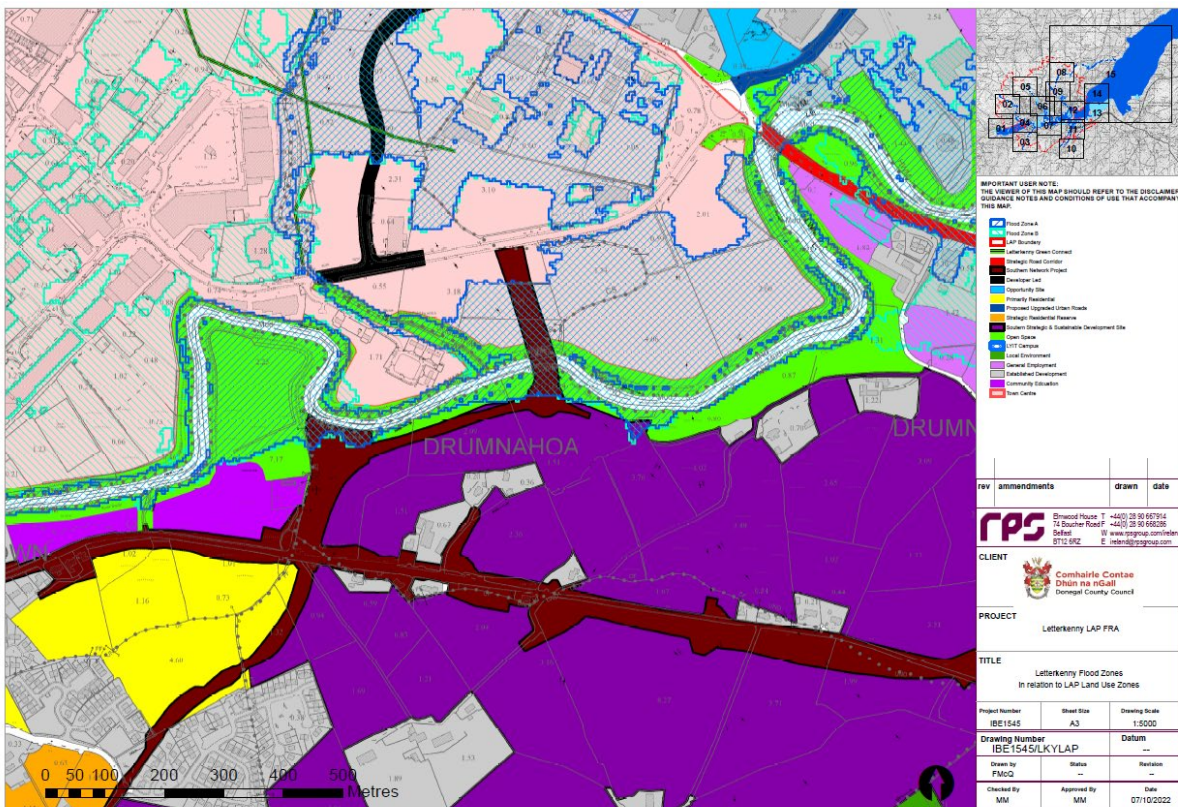


Figure 6-4: Established lands adjacent to the Swilly River, opposite the Mount Errigal Hotel and in the vicinity of the polestar roundabout

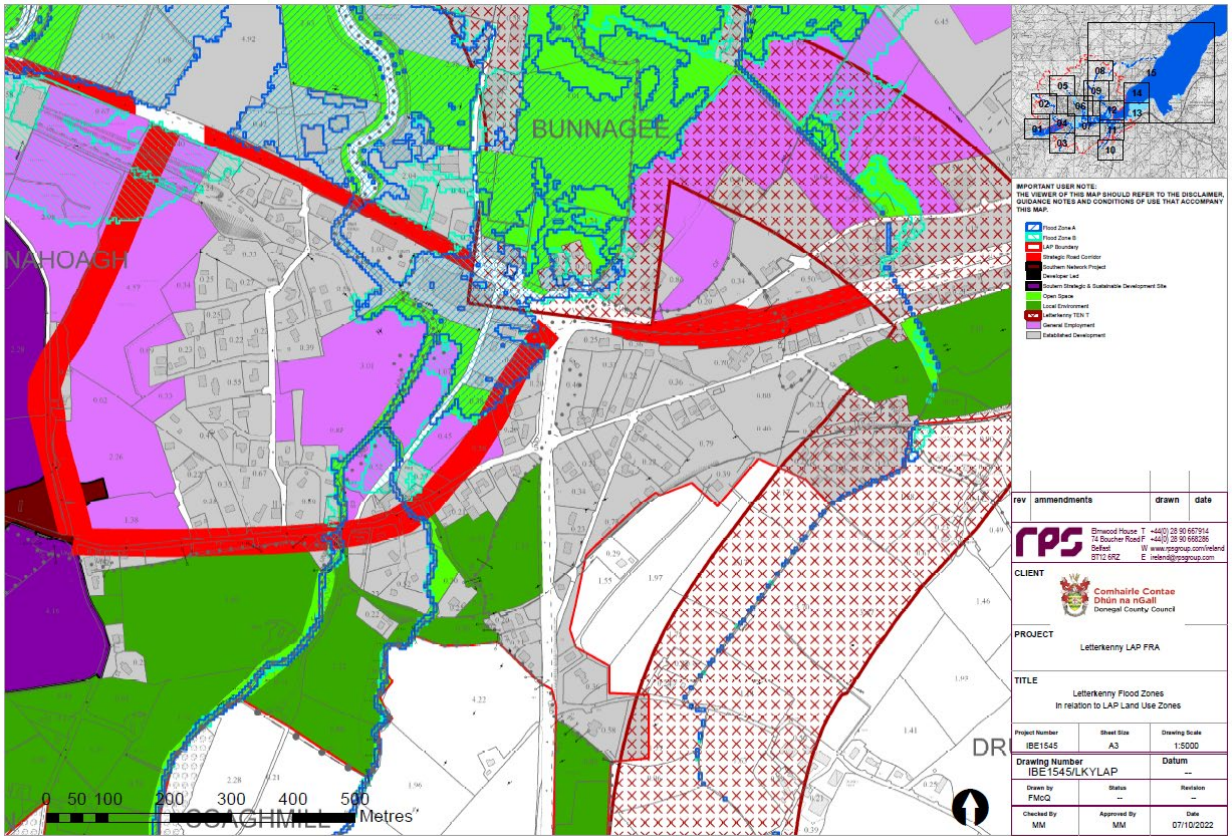


Figure 6-5: Established development lands at Bonagee and along the four lane carriageway, including the Clanree Hotel, commercial development and a number of residential properties

6.3 UNDEVELOPED LANDS AT RISK OF FLOODING

The SFRA identified several areas of undeveloped land which are at risk of flooding that required a review of the appropriateness of the land use following 'The Guidelines' sequential approach. The Planning Authority had regard to Section 4.26 and 4.27 of the Guidelines in reconsidering the zoning. Following this reconsideration, the Planning Authority implemented a range of decisions in various areas of the LAP:

1. Removed the existing zoning for all types of development on the basis of the unacceptable high level of flood risk;
2. Required the preparation of a detailed flood risk assessment to prepare a strategy for development in more detail and prior to any development.
3. Where the criteria of the Justification Test have been met, retain the zoning and require a detailed flood risk assessment and the application of Section 5 of the Guidelines.

6.3.1 Avoidance

In several areas flood risk has been avoided by recommending zoning the conflicting areas with water compatible land uses. These areas have varying degrees of flood risk and could also be impacted by changes to the floodplains due to climate change.

A list of these areas is provided below in Table 6.1 which provides a detailed explanation of the potential conflicts between areas of flood risk and land use zoning classes that are not appropriate and the measures undertaken through the revision of the land use zonings to ensure appropriate development is zoned in areas of flood risk and vulnerable development is avoided in these areas.

Maps 4 – 14 inclusive in Appendix A show the areas where flood risk has been avoided by zoning the land for water compatible uses, predominantly 'Open Space'.

All development in these areas should still consider flood risk. Development should be supported by an appropriately detailed Flood Risk Assessment (FRA). The level of detail within the FRA will depend on the risks identified and the proposed land use. All development proposals shall carry out a surface water and drainage assessment to ensure that drainage from the site is managed sustainably.

Table 6.1: Areas where avoidance has been recommended for vulnerable development zoning within flood risk areas

Development Land Zoning	Vulnerability class	Flood Zone	Map Reference (Appendix A)	Preliminary consideration in context of the land use zoning map	Summary of Position
Opportunity Sites	Less Vulnerable	A & B	Map 5	Relates to a land parcel located at Windyhall which has been zoned as opportunity site 9. A watercourse runs along the southwestern boundary of the site, resulting in a small area of potential flood risk in this area. This would not necessarily preclude development on the remainder of the site and it is considered appropriate to identify the linear corridor of Flood zones A and B at this location as 'open space'.	No justification test required. Action has been taken to identify linear areas of flood risk as 'Recreation and Amenity.', i.e. water compatible development
			Map 6	Map Reference 6 relates to Opportunity 1 at Gortlee which is a large Opportunity site identified for a range of uses which may include residential, offices, tourism, institutional or local neighbourhood level uses. Flood Zone A and B run along the edge of the site adjacent to the De Valera Road associated with nearby areas of flood risk on the western side of the De Valera Road. The area of flood risk within the site is limited in nature and can be addressed by reduction in the extent of the Opportunity site and identification of a linear area of 'open space' to link to the town park. Notwithstanding, the development of the Gortlee Opportunity site may intensify the flood risk issues experienced downstream around the area of Tesco and therefore the text in relation to Opportunity Site 1 will require revision to ensure that any development proposals provide adequate assessment of the impact of a proposed development on flood risk downstream together with appropriate measures to address it.	No justification test required. Action has been taken to identify flood risk area as 'Open Space' and reduce the area of 'Opportunity Site 1'.
			Map 7	Map reference 7 relates to lands adjoining the river at the Polestar Roundabout. The lands are zoned as Opportunity Site 5 in the CDP 2018- 2024 for the purposes of commercial tourism/leisure facilities and excluding residential. These uses are considered as less vulnerable uses within the Flood Risk Management Guidelines, however, given the extent of encroachment of Flood Zone A throughout the most part of the site, these uses would require a justification test. It is not considered that a justification test would be favourable as (i) the site is not essential to facilitate regeneration	No justification test required. Action has been taken to identify flood risk areas as 'Open Space and 'Established development'

Development Land Zoning	Vulnerability class	Flood Zone	Map Reference (Appendix A)	Preliminary consideration in context of the land use zoning map	Summary of Position
				<p>and/or expansion of the centre of the town; (ii) does not comprise significant previously developed and/or under utilised lands; (iii) is not within or adjoining the core of the town in line with the definition of 'core' in the Flood Risk management Guidelines and given the separation of the lands from the core by virtue of existing strategic roads; (iv) is not essential in achieving compact and sustainable growth and (v) there are suitable alternatives elsewhere. In lieu, it is considered that the lands at risk will better serve to contribute to the green infrastructure strategy associated with the river with the exception of the areas of established development located along the roadside edge of the lands (namely a business named 'The Flooring Company' and associated car park, as well as a shed structure located on a concreted yard area and remainder of associated walls and gates). These areas are reasonably to be delineated as 'established development.'</p>	
			<p>Map 13/14</p>	<p>Map reference 13 and map reference 14 both relate to Opportunity site 4 in the existing CDP 2018-2024 described as 'Thorn Pier and Landing stage'. The existing plan policy provides for a potential waterfront regeneration project introducing a number of appropriate commercial tourism/leisure uses and notes the considerations to be made in relation to flood risk and environment designations. Existing policy also excludes residential development specifically. The SFRA indicates that most of this site is located within both Flood Zones A and B, the extent of which are almost identical. In any event, only water compatible development is considered as development appropriate in line with the flood risk management guidelines and any other development (less vulnerable or highly vulnerable) requires a justification test. This site is not likely to meet the requirements of a justification test as it is (i) not necessary to facilitate the regeneration and/or expansion of the centre of the town (ii) does not comprise significant previously developed and/or under-utilised lands (iii) is not within the core of the established town (iv) and there are suitable other lands for the purposes of less vulnerable or Highly vulnerable development. Having regard to the foregoing, it is considered appropriate to identify the site for its recreational value and as having potential for recreational and water compatible uses associated with the pier and with a future potential walkway along the river. It is therefore considered appropriate to</p>	<p>No justification test required. Action has already been taken to delete the Opportunity Site and to identify the area as 'Open Space.'</p>

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Development Land Zoning	Vulnerability class	Flood Zone	Map Reference (Appendix A)	Preliminary consideration in context of the land use zoning map	Summary of Position
				delete the Opportunity Site zoning and to identify the lands as 'open space'.	
General Employment & Commercial	Less Vulnerable	A	Map 9	Relates to The IDA Business Park. Predominantly Flood Zone B occurs in a linear manner along two existing watercourses and linking to the existing Enterprise Centre and largely coordinates with a linear open space zoning in any case only overlapping with General Employment zoning marginally. This represents only a linear area of Flood Zone B risk for development type considered as less vulnerable and therefore to retain any overlap with the General Employment zoning would not require a justification test. The existing open space zoning together with a marginal increase of this to reflect the flood zone B is considered to provide a template for walkability and accessibility (including cycle) through this area of general employment and furthermore linking northwards to LYIT lands and SRR lands.	No justification test required. Action has been taken to identify linear areas of flood risk as 'Open Space.'
			Map 11/12	Relates to lands at Bonagee that had a proposed zoning of general employment originally, located to the north of the four lane carriageway and traversed by the reserved routes for the Ten-T link road as well as reserved routes for developer led roads. Flood zones A and B overlap with a significant area of General Employment lands, the development of which is classed as less vulnerable in accordance with the Guidelines. Within Flood Zone A, this land use zoning would require a justification test while in Flood zone B, less vulnerable uses are considered appropriate. However, given the configuration of the flood risk shown on the mapping indicating several Flood Zone B areas located closer to the river, it results in a disjointed area for potential development.	No justification tests required. Action has been taken to revise area of 'general employment', to open space' and 'established development'

Development Land Zoning	Vulnerability class	Flood Zone	Map Reference (Appendix A)	Preliminary consideration in context of the land use zoning map	Summary of Position
				<p>In addition, initial design in respect of the link road associated with the Ten-T indicates that there will be no provision for the 'developer led roads' to service the lands but rather provision for local access arrangements will continue. Therefore subject to the delineation of existing development in this area as 'established development', it is recommended that the flood zone A be amended to 'open space' in so far as access can be taken from the main existing roads servicing existing economic developments and that, where the land areas identified as Flood Zone B are disjointed from the greater area of development appropriate lands, these also be delineated as 'open space' in addition to having due regard to the corridor in respect of the strategic Ten-T route. To compensate for the loss of employment lands in the Bonagee and Port Road areas, new areas of 'General Employment and Commercial' land have been provided for in the Mountain Top area and in Bonagee; the latter at locations outside of Flood Zone A.</p>	
	Less Vulnerable	A	Map 11	<p>In relation to the area located to the rear of the Clanree Hotel, this area partly overlaps with area of flood zone A which would require a justification text in line with the guidelines if this entire area was proposed as general employment and commercial development. It is noted that the predominant area of flood zone A overlaps with the existing Clanree Hotel all of which is proposed to be identified as 'Established development' in the forthcoming LAP to reflect the long established existing uses. It is considered at this stage in the process that the lands to the rear of the Clanree Hotel provide for potential future expansion or for other 'General Employment and Commercial' uses and for the most part are at the location of flood zone B therefore a justification test is not required in that regard. Thereafter, Flood zone A is delineated along an existing open watercourse with flood risk area to the rear of the existing hotel. It is therefore recommended that these areas be identified as 'open space' around which any proposals for extension or for new economic development may be designed.</p>	<p>No justification test required. Action has been taken to:</p> <ul style="list-style-type: none"> • Reflect the full extent of existing development as 'Established Development.' • Identify the remaining areas of flood zone A as 'open space'.

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Development Land Zoning	Vulnerability class	Flood Zone	Map Reference (Appendix A)	Preliminary consideration in context of the land use zoning map	Summary of Position
Strategic Residential Reserve	High	A & B	Map 4	Map reference 4 relates to lands at Sallaghagrane on the Glenties Road and located north of the Aura Leisure Centre. Zoned as Strategic Residential reserve there are a number of pockets of flood risk, both A and B within the site which are recommended to be identified as 'open space' and which would form the basis of green infrastructure within an overall design concept of the site should the lands be suitable at some point in the future for 'primarily residential.'	No justification test required. Action has been taken to identify linear areas of flood risk as 'Recreation and Amenity.'
			Map 5	Relates to Strategic Residential Reserve lands in Glencar Irish indicating a linear area of Flood Zone A and B that is recommended for inclusion as 'open space'	No justification test required. Action has been taken to identify linear areas of flood risk as 'open space.'
Community and Education	High	A & B	Map 5	Relates to a small area of land within the 'Community/Education' zoning to the north west of the hospital, located within Flood Zone A. The area in question is immediately south of a proposed 'Open Space' zoning within a parcel that is zoned as Opportunity site 9 and given the limited extent of flood area shown within the 'Community/Education' zoning on Map 5 it is considered reasonable that the proposed Open Space zoning be extended into this 'Community/Education' area.	No justification test required. Steps have been taken to amend the area of conflict to 'recreation and amenity.'
Strategic Community Opportunity	High	A & B	Map 9	Map reference 9 refers to a small area of 'Flood Zone A' land that is currently zoned as Strategic Community Opportunity, to the northwest of Pramerica, Sita and Optibelt. The rezoning of this small area to 'Open Space' would not prejudice the development of the remainder of the lands. This area is subject to a requirement for co-ordinated and masterplanned approach to ensure connectivity and permeability throughout adjacent land parcels including the General employment and commercial zoning immediately downstream where a similar approach to flood risk avoidance has been taken.	No justification test required. Steps have been taken to reflect the limited areas of flood risk as 'recreation and amenity.'

Development Land Zoning	Vulnerability class	Flood Zone	Map Reference (Appendix A)	Preliminary consideration in context of the land use zoning map	Summary of Position
Local Environment	High and Less Vulnerable	A & B	Map 4	Map reference 4 relates to lands at Sallaghagrane that are currently zoned 'local environment'. Within the 'Local Environment' zoning small scale one off type development can be considered which potential includes single one off houses and therefore may provide for a combination of Less vulnerable and Highly vulnerable development. As a result, it is appropriate to identify the linear area of flood zone A and B as 'Open Space.'	No justification test required. Steps have been taken to reflect the limited areas of flood risk as 'recreation and amenity.'
			Map 8	Map reference 8 relates to lands at Carnamuggagh Lower and should be read in conjunction with Row 6 in this table (map reference 8). It reflects the same position as outlined in respect of Map reference 4 above	No justification test required. Steps have been taken to reflect the limited areas of flood risk as 'recreation and amenity.'
			Map 11	Relates to two areas of 'Local Environment' zoning located at Bonagee (east of the Ballybofey National Primary Road) and at Dromore. The flood zone mapping indicates in both cases that there are limited linear layout areas of flood risk A and B.	No justification test required. Action has been taken to identify linear areas of flood risk as 'Recreation and Amenity.'
			Map 14	Relates to the eastern edge of lands at Glebe where Flood Zone A is indicated. This area is adjacent to the eastern edge which is already identified as 'open space'. Therefore it is recommended to slightly adjust the area of 'open space' in order to include the additional edge	No justification test required. Action has been taken to identify linear areas of flood risk as 'Open Space'.'
Southern Strategic and Sustainable Development Site	High and Less Vulnerable	A & B	Map 7	In addition to the housing development opportunities identified on lands zoned as 'Primarily Residential', 'Opportunity Site' and 'Town Centre', the Plan also identifies a key future development area to the south of the River Swilly. Development of this area, hereafter referred to as the Southern Strategic and Sustainable Development Site (SSDS), is currently constrained by the absence of water and sewer networks, a bridge crossing over the immediately adjacent	No justification test required. Action has been taken to identify linear areas of

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Development Land Zoning	Vulnerability class	Flood Zone	Map Reference (Appendix A)	Preliminary consideration in context of the land use zoning map	Summary of Position
				<p>River Swilly and deficiencies in the local road network. Notwithstanding these current constraints, the area is specifically addressed in this Plan because of its location immediately adjacent to the town centre and the sequential growth opportunities that arise.</p> <p>The zoning of these lands has extended only as far as the boundary of Flood Zone B and the areas at flood risk adjacent to the River Swilly have therefore been left as open space to ensure that the site will not be impacted by flooding</p>	flood risk as 'Open Space'.

6.3.2 Highly Vulnerable Development

6.3.2.1 Strategic Road Infrastructure

DCC has identified undeveloped areas for strategic road infrastructure which include portions of lands in flood risk areas. Strategic infrastructure such as this, including the TEN-T road corridors, are considered as highly vulnerable development in the context of the 'Guidelines' due to their strategic nature. The locations are illustrated in Figures 6.6 – 6.9 inclusive.

6.3.2.1.1 Strategic Road Corridor with minor impact on areas of flood risk

Figure 6.6 and 6.7 show the strategic road infrastructure at Kirkstown (Western Relief Road) and Glencar (Northern Relief Road) cross a limited extent of flood risk areas. In these instances the extent of the lands within Flood Zones A or B is insignificant in the context of the wider overall lands zoned at the location. Due to relatively small watercourses and floodplains there is a high likelihood that this will not increase the risk of flooding elsewhere provided adequate mitigation measures including the consideration of suitable bridge spans can be proposed as part of a site specific FRA. Justification Tests for these sites are included in Appendix B. All the areas are being retained with a zoning objective which includes strategic road development. Applying the Guidelines to the formulation of detailed FRA at the Development Management stage means such development will be appropriately assessed and designed to ensure that there is limited impacted on flood risk provided the mitigation to span the limited flood risk areas is achieved.

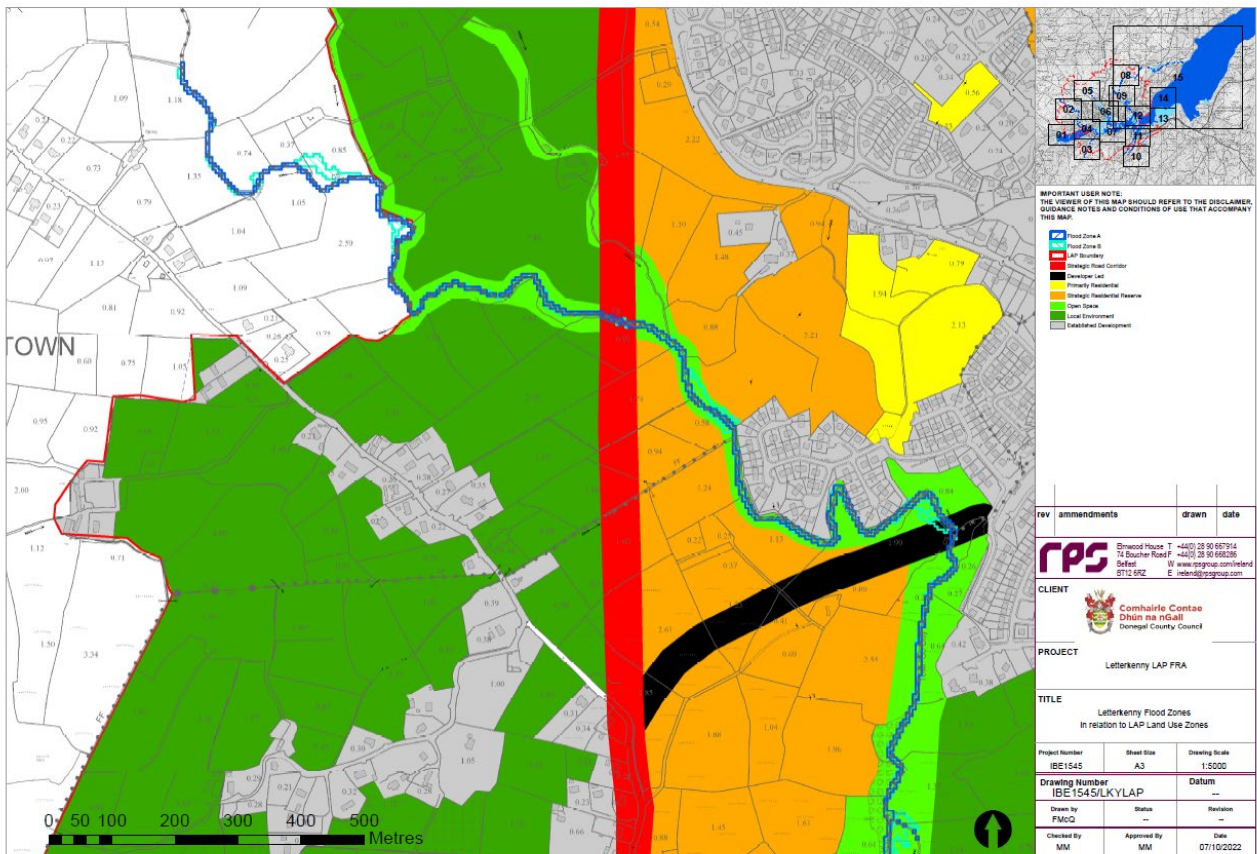


Figure 6-6: Strategic Road Infrastructure at Kirkstown (Map 2 Appendix A)

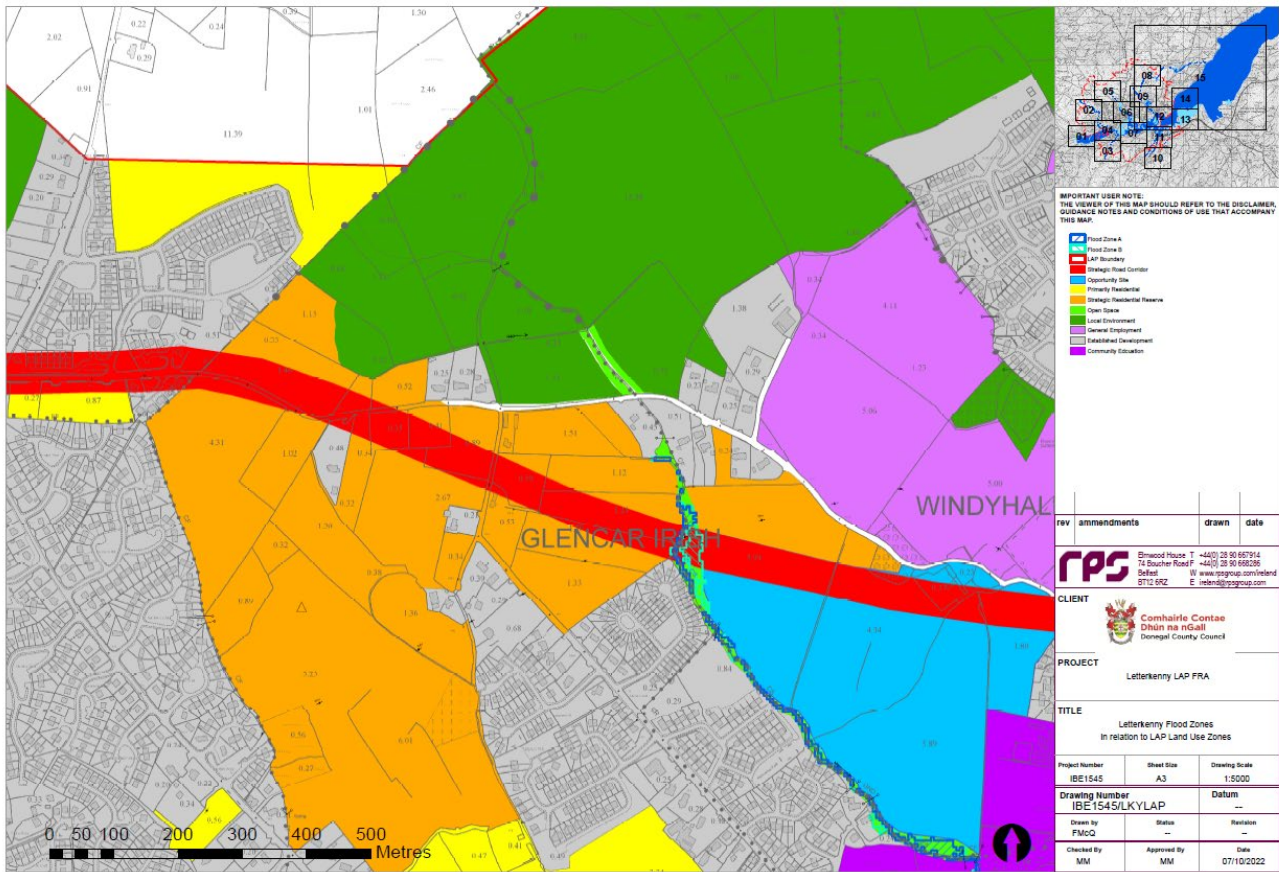


Figure 6-7: Strategic Road Infrastructure at Glencar (Map 5, Appendix A)

6.3.2.1.2 TEN-T Priority Route Improvement Project, Donegal (PRIPD) and Strategic Road corridor at Drumnahoagh and Bonagee Roundabout

Figure 6.9 illustrates the location of the strategic TEN-T Priority Route Improvement Project, Donegal (PRIPD) and the Strategic road corridors at Drumnahoagh and the Bonagee Roundabout. Extensive option development has ensured that flood risk is reduced as much as possible in this corridor whilst still achieving the objectives of the project. Separate Justification Tests for the TEN-T PRIPD and the Strategic Road Corridors for Drumnahoagh and Bonagee are included in Appendix B.

All the areas are being retained with a zoning objective for strategic road development. As outlined in the justification tests, included in Appendix B, mitigation to offset any potential to increase flood risk is possible including spanning the flood plains, so long as adequate freeboard is provided and it can be proven that any supports required in the flood plain have a negligible effect on the displacement of flood waters. Flood relief culverts through road embankments may also be an option to allow flood waters to reach their natural flood extents. Applying the Guidelines to the formulation of detailed FRA at the Development Management stage means such development will be appropriately assessed. These strategic road corridors will be subjected to a flood risk assessment at an appropriate level of detail and designed to ensure that there is limited impacted on flood risk.

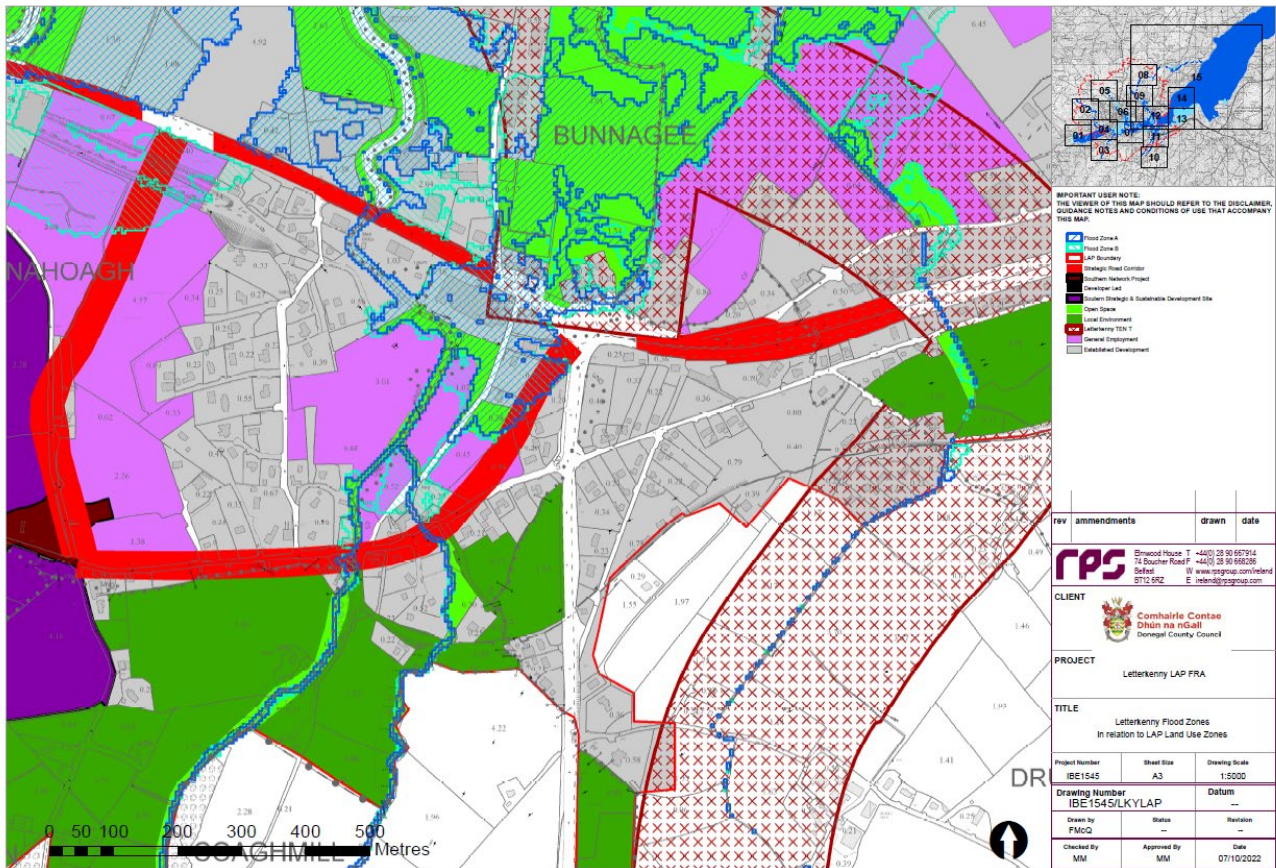


Figure 6-8: Strategic Road Infrastructure corridor from TEN-T option appraisal at Bonagee and Strategic road corridors at Drumnahoagh

6.3.2.2 Southern Network Project

The Southern Network Project (SNP) (previously referred to as the Southern Relief Road) has been conceived as a strategic transportation corridor development project commencing on the N13/N14 and traversing in a westerly direction. The scheme terminates adjacent to the Ballymacool roundabout located to the west of the town with a proposed connection onwards to the Rock Hill Road and the west of the county. The project comprises online widening (Leck Road and Rockhill Road), new road construction and new river crossings.

Given the objective of this project and in particular the need for a number of crossings of the River Swilly it is not possible to avoid crossing areas at flood risk. A detailed flood risk assessment has already been completed for large parts of the new road construction where the outline design has been completed. **Figure 6-10** shows the extent of the Southern Network Project where a detailed flood risk assessment has already been completed.

A new 1D/2D hydraulic model has been constructed using Innovyze Integrated Catchment Management (ICM) software of the Lismonaghan watercourse. The new relief road model was used to assess the impact of potential flooding to properties and infrastructure. Following this, the results were used to determine whether mitigation measures would be required to offset potential increases in this flood risk.

Hydraulic modelling indicated that flood extents remain unchanged and water levels increases are negligible. No additional receptors are expected to become at risk due to the construction of the relief road and culvert so no mitigation measures are considered necessary along this section.

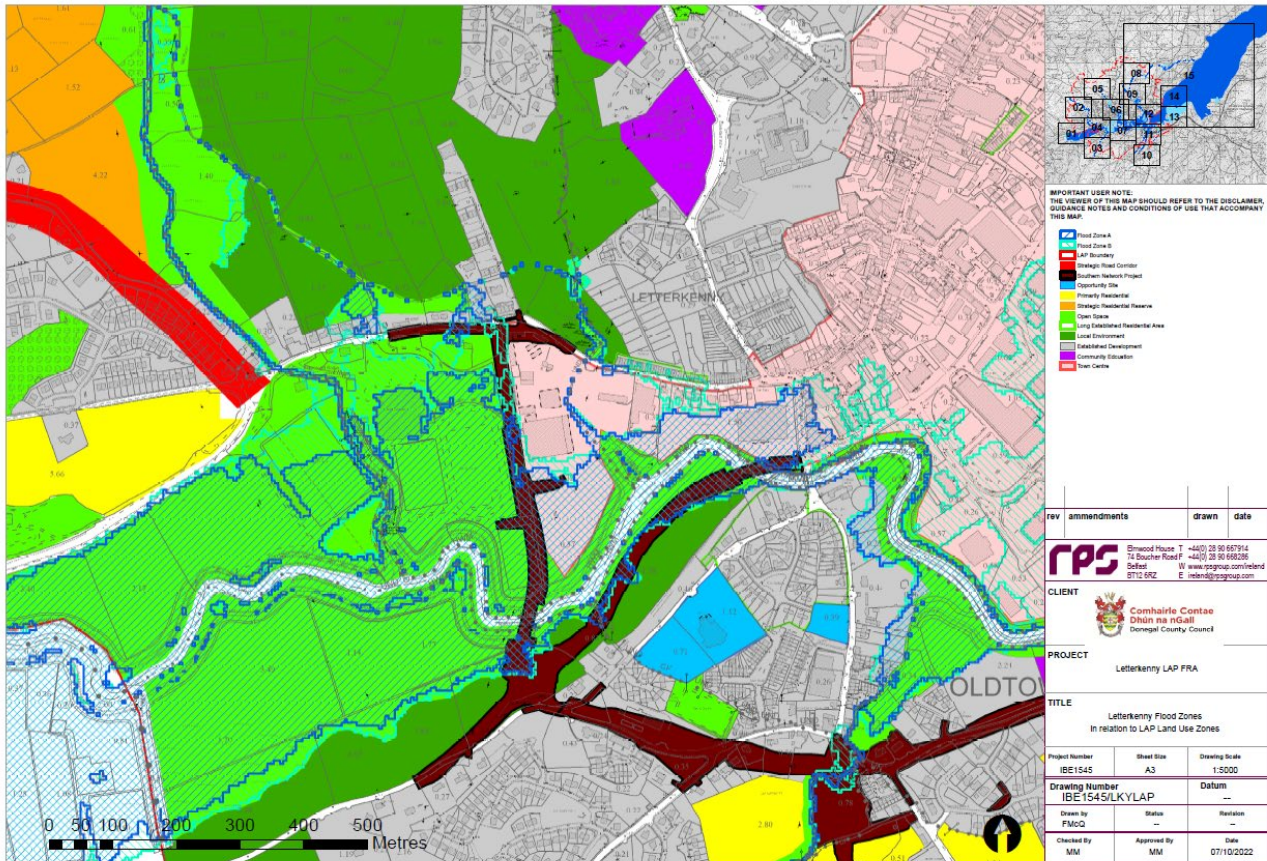


Figure 6-9 – Location of Southern Network Project

The Southern Network Project also requires a number of crossings of the River Swilly and its floodplain. This means the corridor will cross areas at flood risk. As outlined in the justification test for the Southern Network Project, mitigation to offset any potential to increase flood risk from the River Swilly Crossings is possible including spanning the flood plains, so long as adequate freeboard is provided and it can be proven that any supports required in the flood plain have a negligible effect on the displacement of flood waters. Flood relief culverts through road embankments may also be an option to allow flood waters to reach their natural flood extents. The detailed development management FRA completed for the elements of this project that have had outline design completed and the mitigation measures necessary to ensure the project will not adversely impact on flood risk for the River Swilly crossings means that the project passes the development plan justification test.

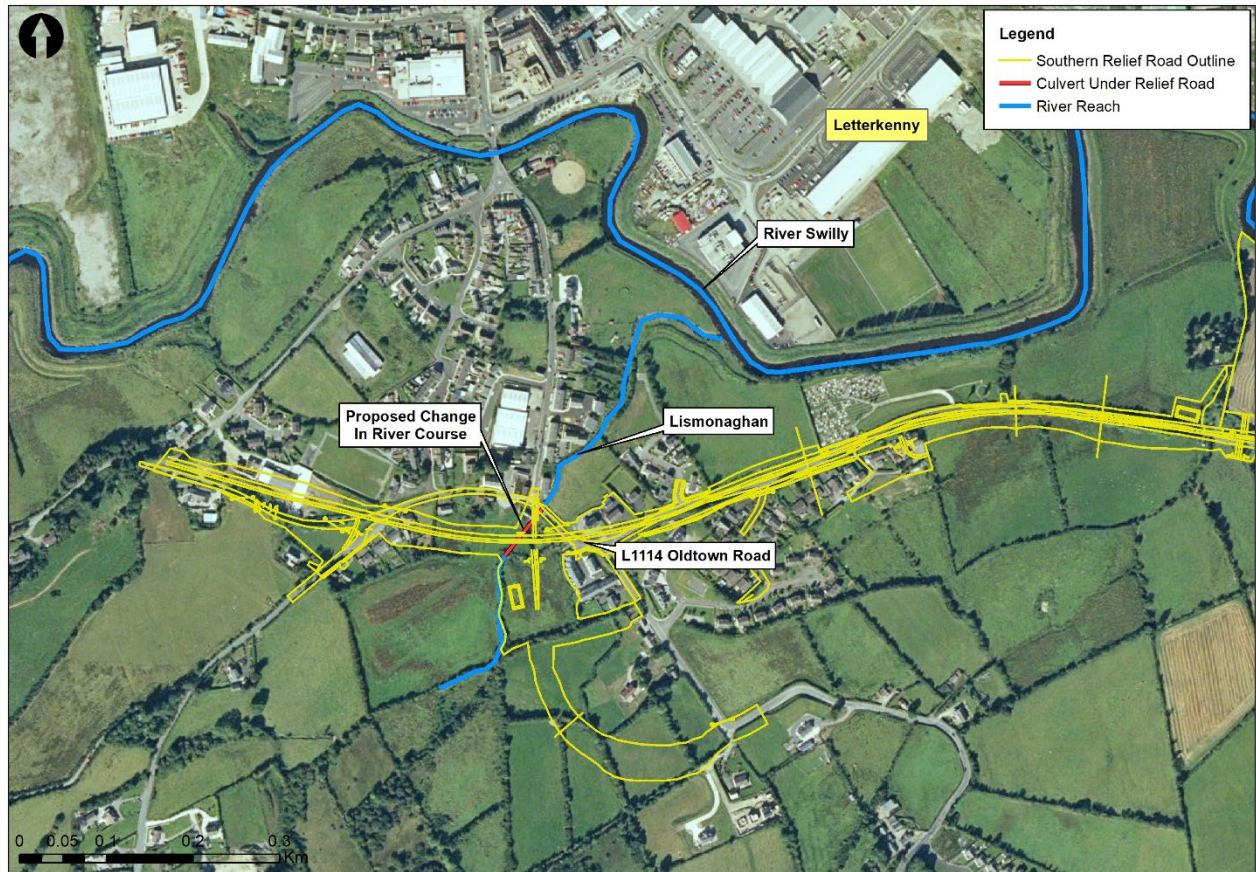


Figure 6-10 – Location of Southern Network Project subject to detailed development management flood risk assessment

6.3.2.3 Flood Risk within the Town Centre Zoning

The topography of the town centre is extremely flat. This is an important consideration when considering flood risk because it means that any increase in water levels can have a significant implication in the overall extent of flooding. The Council has undertaken dedicated modelling as part of this SFRA which investigate this. A number of computer model simulations have been run to determine the impact of developing some of the undeveloped Town Centre sites that are affected by flooding, particularly flood zone A where vulnerable and less vulnerable development should be avoided. This analysis confirmed how sensitive the Town Centre is to the displacement of water with all simulations indicating a significant increase in flooding extents resulting in properties not previously at risk of flooding to be impacted. The entire Town Centre zoning is not going to pass the Development Plan Justification Test for any undeveloped sites that are within flood zone A and to comply with the Planning System and Flood Risk Management Guidelines it will be necessary that these sites are zoned as for Water Compatible uses only. Undeveloped lands within flood zone B can be zoned for less vulnerable development, as defined in **Table 3.3** without the need for a justification test, however any application for planning would require a detailed development stage FRA.

In relation to existing developments in the Town Centre currently affected by flooding. RPS would recommend a general assumption of a restriction is placed on the extension of these buildings beyond the current footprint, unless accompanied by a detailed site specific flood risk assessment which can identify appropriate compensatory measures that show no increase in flooding elsewhere. This is to ensure compliance with Circular PL 2/2014 issued by the Department for Environment Community and Local Government in August 2014 as a clarification to The Planning System and Flood Risk Management Guidelines.

Figure 6.10 shows the Town Centre zoning and areas of Flood Risk.

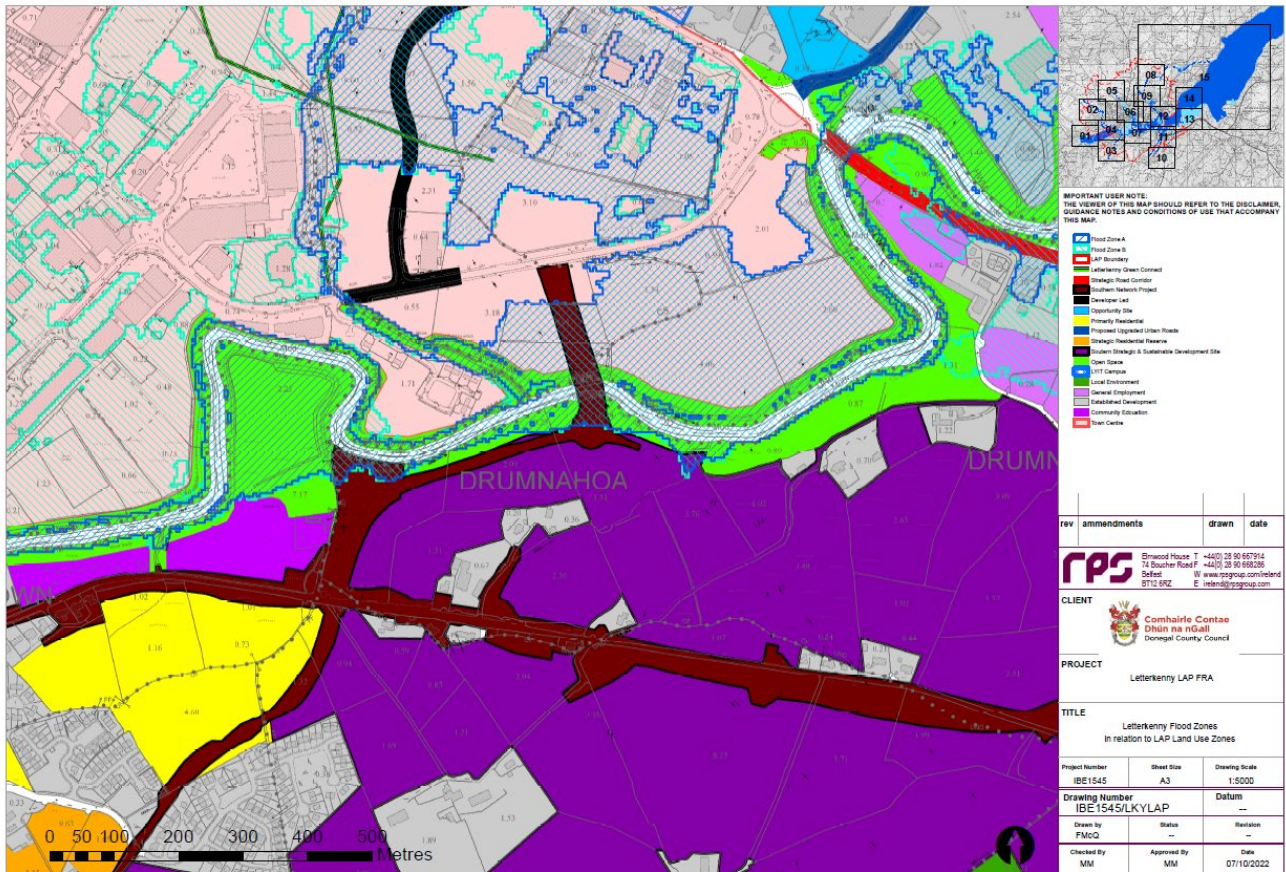


Figure 6-11: Town Centre zoning and areas of Flood Risk

6.3.3 Less Vulnerable Development

6.3.3.1 Opportunity Sites

A new InfoWorks ICM model has been developed as part of the SFRA covering Opportunity Site 7, 11 and the Town Centre Zoning. This facilitates the assessment of the implications of development of these sites in combination and any potential increase in flood risk elsewhere.

6.3.3.1.1 Opportunity Site 3

This area is the location of a new school Educate Together, (blue zoning area in Figure 6.11) and it is appropriate to identify the extent of the existing school as established development. The remaining area of the most northerly site is impacted by an area of flood zone A and B predominantly on its lower levels. The uses identified in the Local Area Plan are a combination of both highly vulnerable (residential use and medical) and less vulnerable uses. Having regard to the nature of this site as a brownfield site surrounded along its boundaries closer to the town centre by established development, it is considered that there is a significant likelihood that the site would pass a stage 1 and Stage 2 justification test on the basis of less vulnerable development.

Using the existing MIKE hydraulic model, developed during CFRAM, RPS have considered the implications of development of this site. The analysis has been undertaken by ‘blocking’ out areas of the site currently at risk of flooding within the model to simulate the implications of developing the site. The model has then been re-run and flood extents compared to the existing. The model runs in this area are positive showing that majority of the site can be developed without increasing the risk of flooding elsewhere. There is a 5m buffer on either side of the watercourse to facilitate access and maintenance and some preservation of existing flood mechanisms but compliance with Point 3 of the Development Plan Justification Test is achievable.

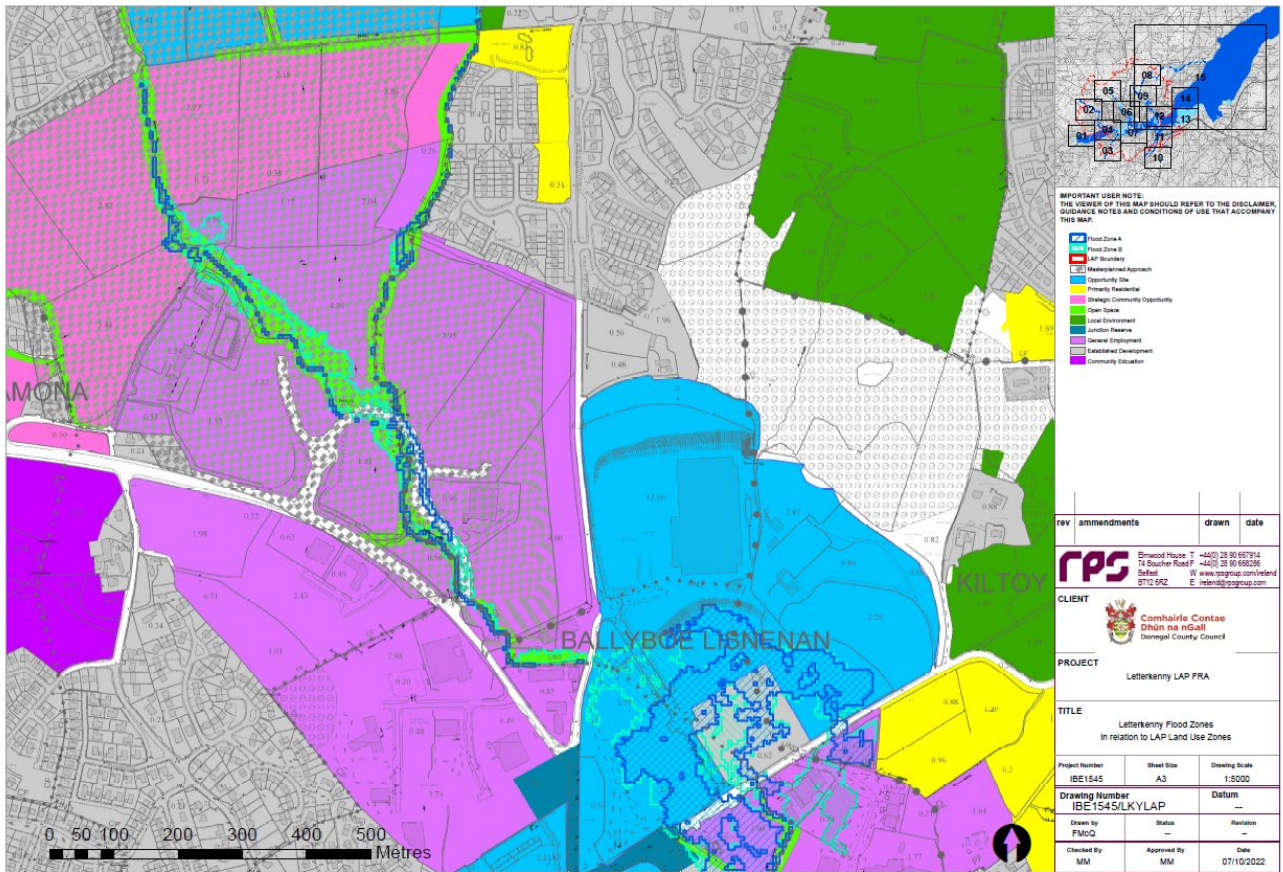


Figure 6-12: Opportunity Site 3 zoning at Kiltoty

6.3.3.1.2 Opportunity Site 7

The lands are at risk of flooding from the Sprack Burn which also represents a risk to the established development land zoning to the rear of the Fire Station on the De Valera Road and further downstream within the Town Centre Zoning. Figure 6.12 shows that there is fluvial flood risk in this area with both Flood Zone A and B present on the site. The indicative pluvial mapping also the area as being particularly at risk.

‘Opportunity Site’ is a less vulnerable land use and a Justification Test been applied as shown in Appendix B for these lands. Flooding on this site is limited to shallow depth sheet flow and hydraulic modelling has demonstrated that with allowing a 5m buffer to the existing watercourse, the remainder of the site can be developed without increasing the risk of flooding to Site 11 or the Town Centre. This site therefore passes the justification test. A FRA of appropriate detail should accompany applications for development on this site to demonstrate that they would not have adverse flood risk impacts.

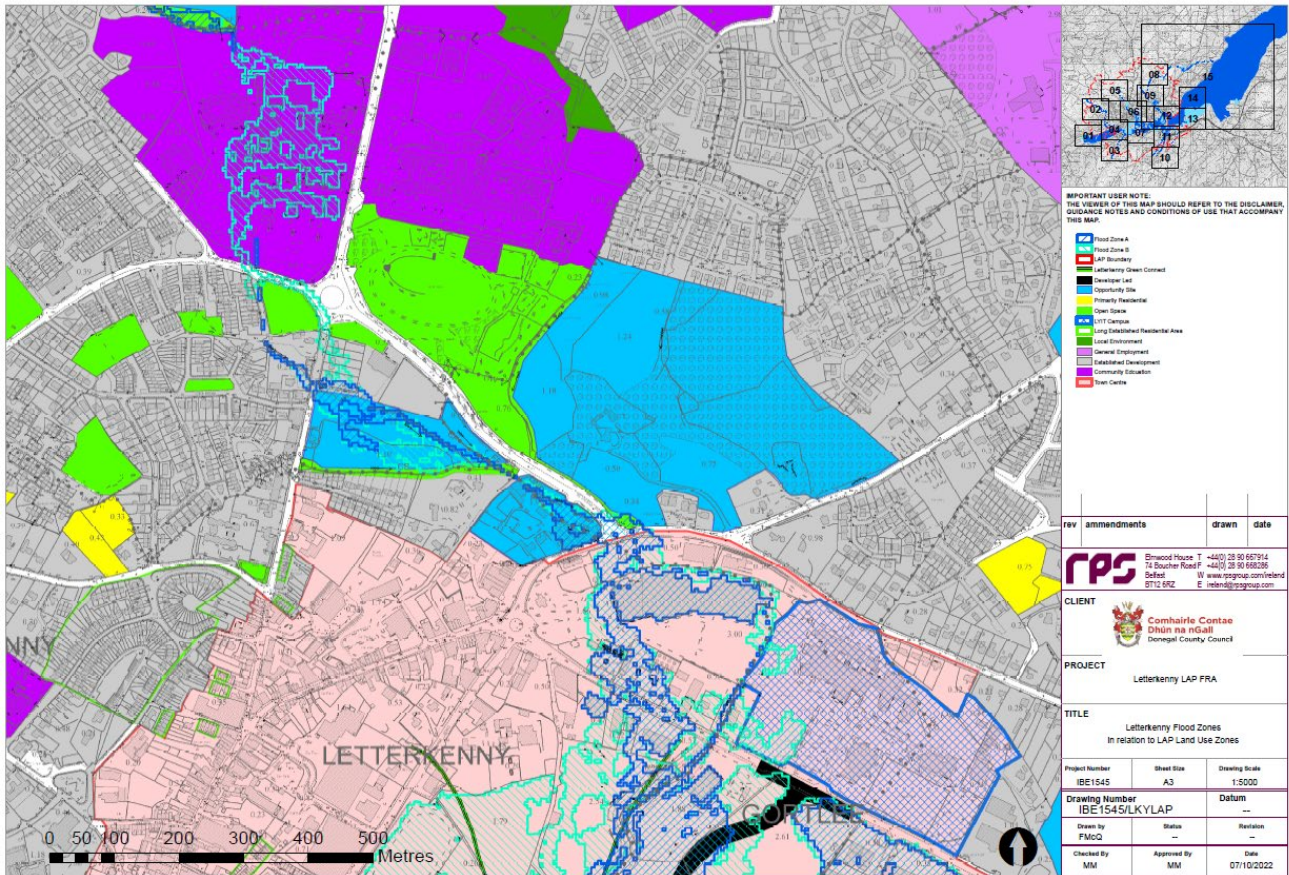


Figure 6-13: Opportunity Sites 7 and 11 zoning at edge of the Town Centre Zoning on De Valera Road

6.3.3.1.3 Opportunity Site 11

Opportunity Site 11 is also at risk of flooding from the Sprack Burn and Flood Zones A and B are both present on the site. An iterative hydraulic assessment using the ICM model developed as part of the SFRA was used to determine the area of the Oatfield site that could be considered as suitable for development in the context of flood risk. It is a probability that development of this site will need to be restricted to those areas not currently shown to be at risk of flooding. The model runs on the Oatfield site allowed for a 5m buffer adjacent to the watercourse and suppressed the flood extents within the site to simulate development within the site. The modelling demonstrated that this type of mitigation within this site would not result in a significant increase in flood risk downstream in the Town Centre provided the buffer zones along the frontage of the site were retained for water compatible land use. A justification test for Opportunity Site 11 is included in Appendix B

6.3.3.2 General Employment and Commercial

The general employment zoning on lands opposite the Educate together Campus (Figure 6.12) at Kiltroy have also been considered as part of the MIKE 11 hydraulic modelling associated with Opportunity Site 3 undertaken as part of this SFRA. There are two land parcels in this area that were proposed as general employment & commercial within flood zones A and B.

There is an existing flooding mechanism that flows from Opportunity site 3 across the road to these general employment lands and then onto the established development that is the Mr Price and Homeland Stores development which fronts the N56.

Using the existing MIKE hydraulic model, developed during CFRAM, RPS have carried out a flood risk assessment to determine the implications of the development of areas of the site that are currently at risk of flooding. This analysis has been undertaken with the aims of maintaining the functional flood plain and flooding mechanisms that currently existing on the site and then assessing the impact of developing the periphery of the floodplain and ensuring there is no increase in risk in flood risk to adjacent sites.

The model results indicate that development can take place without increasing the risk of flooding elsewhere. In addition, there is a 5m buffer on either side of the watercourse to facilitate access and maintenance and some preservation of existing flood mechanisms. This flood risk assessment has demonstrated that flood risk to the development can be adequately managed and the use or development of the lands at the General Employment lands at Kiltoty, within the boundary illustrated in Figure 6.14 below, will not cause unacceptable adverse impacts elsewhere.

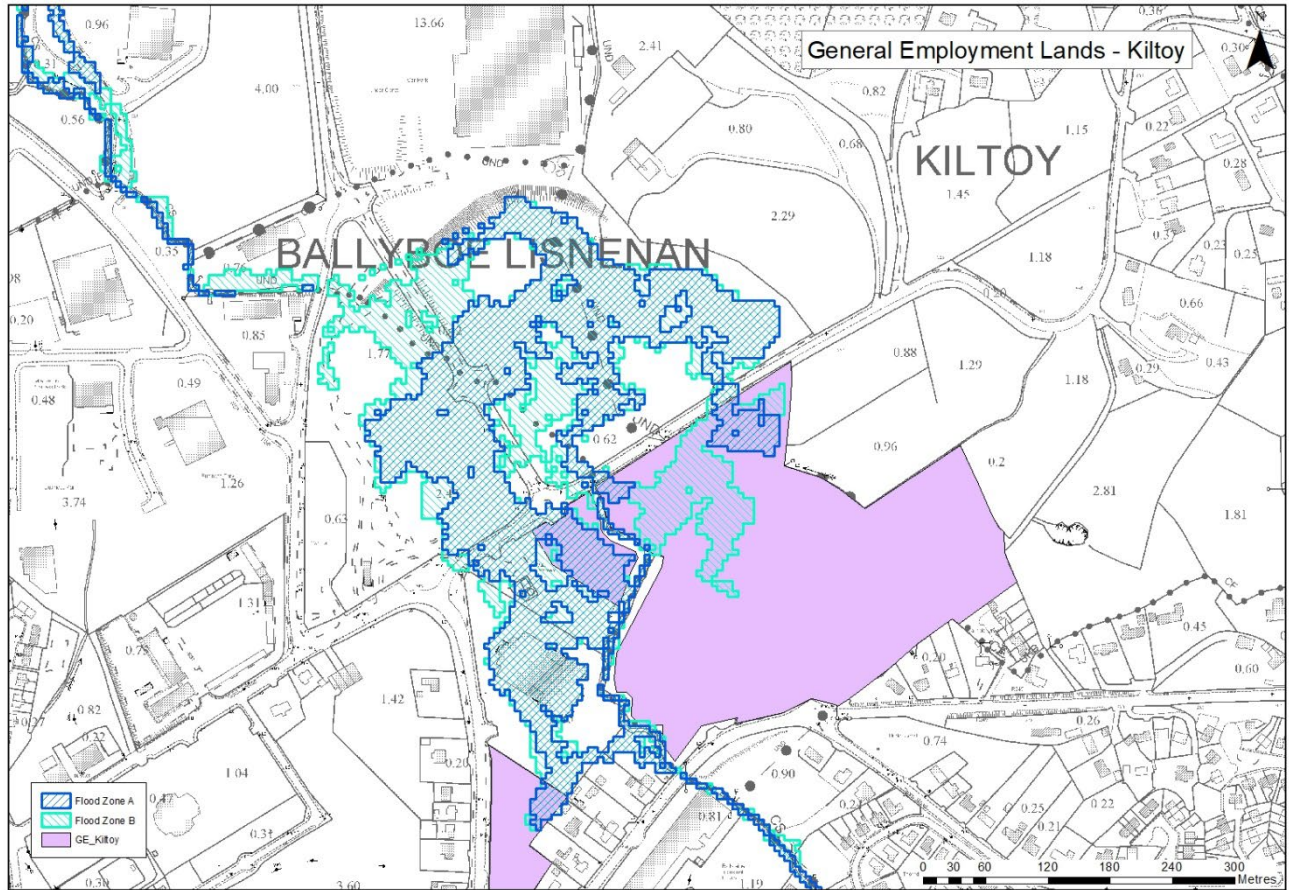


Figure 6-14: General Employment Zoning in Flood Risk Area opposite Educate Together

6.3.3.3 Developer Led Roads

Developer led roads would be considered to be less vulnerable infrastructure as they are not strategic in nature so would be considered appropriate in flood zone B.

The locations are illustrated in Figures 6.13 – 6.15 inclusive. Figure 6.13 shows the developer led road infrastructure crossing a limited extent areas of flood risk in this instance, the extent of the lands within Flood Zones A or B is insignificant in the context of the wider overall lands zoned at the location. Justification Tests for this sites is included in Appendix B. Applying the Guidelines to the formulation of detailed FRA at the Development Management stage means such development will be appropriately assessed and designed to ensure that there is limited impacted on flood risk provided the mitigation to span the limited flood risk areas is achieved.

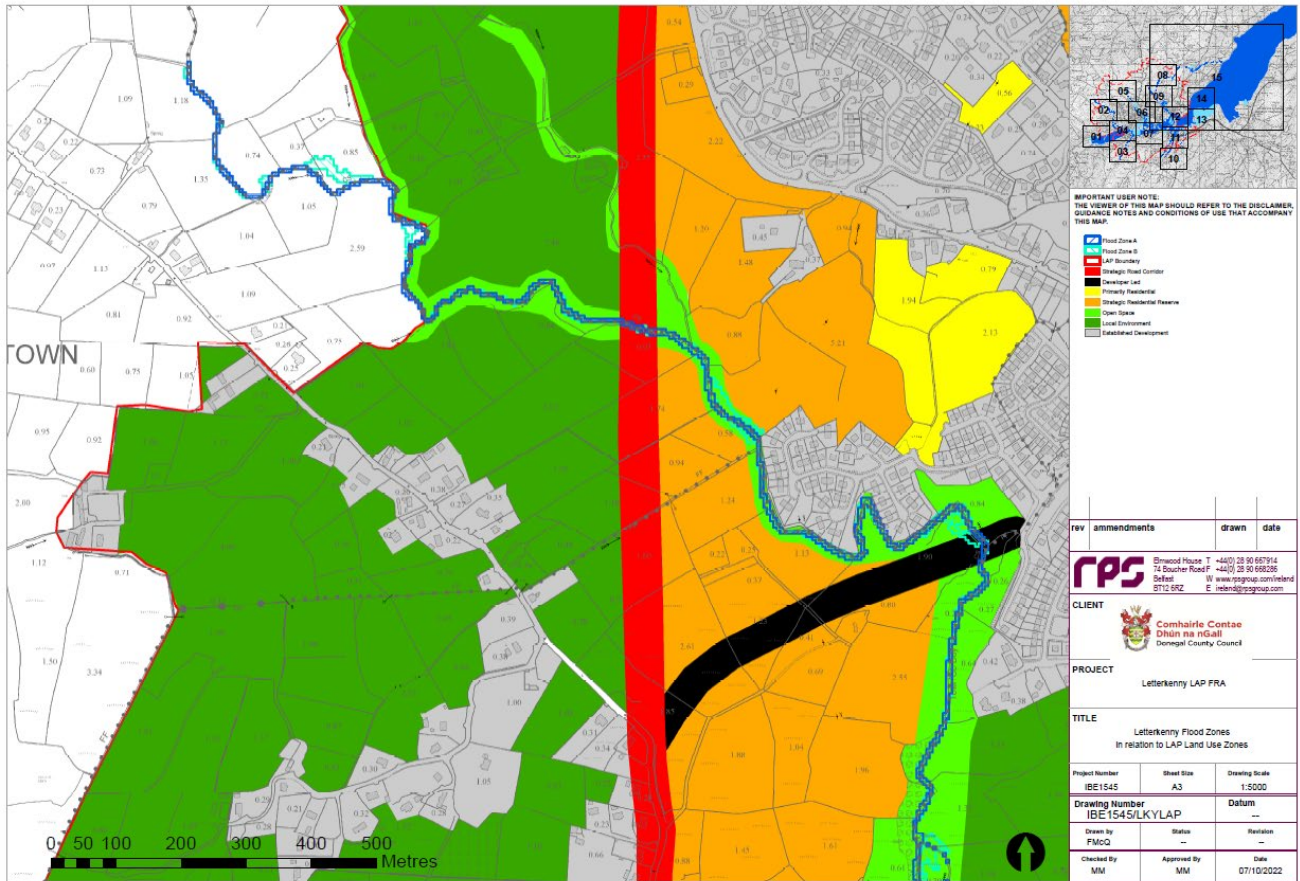


Figure 6-15: Developer Led Road at Ballymacool

The developer led roads that are zoned for within the Town Centre (Figure 6.15) should be incorporated into the consideration of flood risk in the overall Town Centre development. Modelling under the SFRA has demonstrated the sensitivity of the Town Centre area to the displacement of water with all simulations indicating a significant increase in flooding extents resulting in properties not previously at risk of flooding to be impacted. Notwithstanding this mitigation in the form of spanning the flood zone A or the installation of flood relief culverts through road embankments may also be an option to allow flood waters to reach their natural flood extents.

Applying the Guidelines to the formulation of detailed FRA at the Development Management stage means such development will be appropriately assessed and designed to ensure that there is limited impacted on flood risk provided the mitigation to span the flood risk areas or install effective flood relief corridors is achieved.

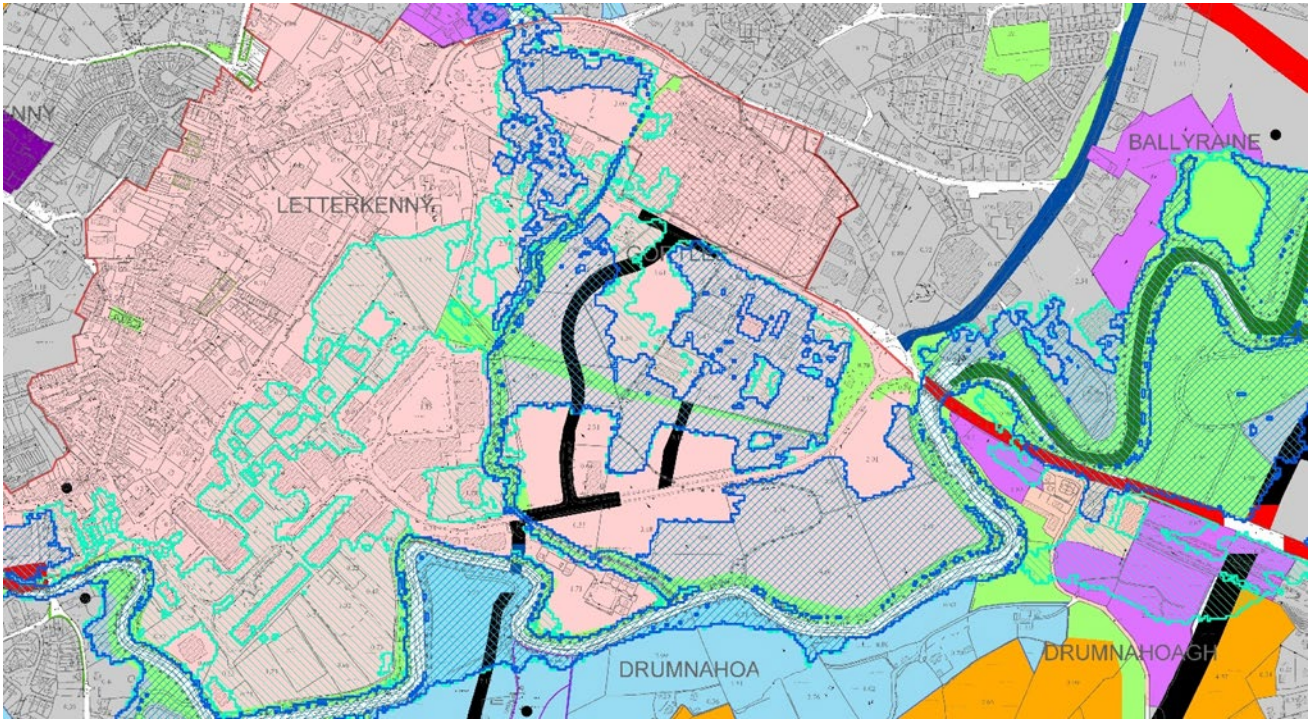


Figure 6-16: Developer Led Roads in the Town Centre Zoning

7 FLOOD RISK MANAGEMENT POLICIES AND OBJECTIVES

7.1 GENERAL DEVELOPMENT PLAN STRATEGIES

The County Development Plan outlines flood risk management strategies for management of development, these include:

7.1.1 Flood Risk Assessment

Flood risk management will be carried out in accordance with the Flood Risk Management Guidelines for Planning Authorities, DOECLG (2009) and Circular PL2/2014. The North Western CFRAMS FRMP provides information in relation to known flood risk in Letterkenny. Development proposals on lands that may be at risk of flooding should be subject to a flood risk assessment, prepared by an appropriately qualified Chartered Engineer, in accordance with the Flood Risk Management Guidelines. Detailed flood risk assessments should be cognisant of possible pluvial flood risk and appropriate drainage proposals should be implemented to reduce the risk of pluvial flooding. Proposals for minor development to existing buildings in areas of flood risk (e.g. extensions or change of use) should include a flood risk assessment of appropriate detail.

7.1.2 Surface Water

Development proposals should provide suitable drainage measures in compliance with the principals of SuDs. The maximum permitted surface water outflow from any new development should not exceed the existing situation. On Greenfield lands the permitted outflow of a development should be the equivalent to a Greenfield Site. All new development must allow for climate change. Development proposals should not give rise to the pollution of ground or surface waters either during construction phases or subsequent operation. This will be achieved through the adherence to best practice in the design, installation and management of systems for the interception, collection and appropriate disposal or treatment of all surface water and effluents.

7.1.3 Sustainable Urban Drainage System (SUDS)

In general all new developments will be required to incorporate Sustainable Urban Drainage Systems (SuDS). Sustainable Drainage Systems include devices such as swales, permeable pavements, filter drains, storage ponds, constructed wetlands, soakways and green roofs. In some exceptional cases and at the discretion of the Planning Authority, where it is demonstrated that SuDS devices are not feasible, approval may be given to install underground attenuation tanks or enlarged pipes in conjunction with other devices to achieve the required water quality. Such alternative measures will only be considered as a last resort. Watercourses should remain open in their natural valley and culverting shall be confined to road crossings. In exceptional circumstances and at the discretion of the Planning Authority, approval may be given to install a culvert within a development where it is demonstrated that this is the most appropriate design response based on site specific constraints/circumstances.

7.2 FLOOD RISK MANAGEMENT OBJECTIVES

The County Development Plan outlines core flood risk management policies which have been strengthened and improved upon since the previous Development Plan.

Table 7.1: DCC Existing Flood Risk Management Policies

Planning Policy ID No.	Policy Description
F-P-1	<p>It is a policy of the Council to ensure that all development proposals comply with ‘The Planning System and Flood Risk Management - Guidelines for Planning Authorities’, November 2009, DoEHLG. In doing so the planning authority shall:</p> <ul style="list-style-type: none"> • Assess developments in accordance with the Sequential approach and precautionary principle set out in the Planning System and Flood Risk Management – Guidelines for Planning Authorities’; and • Utilise the Draft Flood Risk Management Plans (and any associated flood risk mapping) prepared as part of the CFRAMS programme, or any other flood risk datasets or mapping it considers appropriate, in assessing flood risk.
F-P-2	<p>It is a policy of the Council to require applicants/developers to submit, where appropriate, an independent ‘Flood Risk Assessment’ in accordance with the Flood Risk Management Guidelines, DEHLG, 2009 or any subsequent related publication and/or ‘Surface Water Drainage Calculations’, from suitably qualified persons.</p>
F-P-3	<p>It is a policy of the Council to require applicants/developers to submit, where appropriate, evidence of compliance with the Justification test set out in S5.15 of The Planning System and Flood Risk Management - Guidelines for Planning Authorities’ (DoEHLG 2009) or any subsequent related publication.</p>
F-P-4	<p>It is a policy of the Council not to permit development where flood or surface water management issues have not been, or cannot be, addressed successfully and/or where the presence of unacceptable residual flood risks remain for the development, its occupants and/or property or public infrastructure elsewhere including, inter alia, up or downstream.</p>
F-P-5	<p>It is a policy of the Council to promote the use of Sustainable Urban Drainage Systems (SUDs), flood attenuation areas, the controlled release of surface waters and use of open spaces and semi permeable hard surfaces for appropriate development proposals.</p>
F-P-6	<p>It is a policy of the Council to consider the development of long and short-term flood remediation works, including embankments, sea defences, drainage channels, and attenuation ponds to alleviate flood risk and damage to livelihoods, property and business subject to environmental considerations including potential impact on designated shellfish water and, fresh water pearl mussel catchment areas, compliance with Article 6 of the Habitats Directive, best practice in Coastal Zone Management and the Marine Resource and Coastal Management policies of this Plan.</p>
F-P-7	<p>It is a policy of the Council not to permit developments which would hinder the maintenance of river or drainage channels.</p>

7.3 FLOOD RISK MANAGEMENT PLANS

The Development Plan already has a commitment to assist with the implementation of the relevant CFRAMs. The North Western CFRAM has been completed since the previous development plan and the following recommendations for flood risk management should be supported:

- Implement the Guidelines to avoid inappropriate development in flood plains, or development that can increase runoff rates and volumes, can create flood risk to the properties being built and potentially increase the risk to other areas.
- Implement the Guidelines to prevent loss of floodplain storage and conveyance.
- SuDS should be applied to all new developments.

8 SUMMARY

8.1 OVERVIEW

The SFRA Report has been prepared in accordance with the requirements of The Planning System and Flood Risk Assessment Guidelines for Planning Authorities (2009) and Circular PL02/2014 (August 2014). The SFRA has provided an assessment of all types of flood risk within the Plan area to assist DCC to make informed strategic land-use planning decisions. The flood risk information has enabled DCC to apply the Guidelines sequential approach, and where necessary the Justification Test, to appraise sites and areas for development and identify how flood risk can be reduced as part of the development plan.

8.2 FLOOD ZONES AND FLOOD RISK

Letterkenny is susceptible to several types of flood risk, including:

- Fluvial - Flooding occurs when a river overtops its banks due to a blockage in the channel or the channel capacity is exceeded.
- Coastal - Coastal flooding occurs when sea levels along the coast or in estuaries exceed neighbouring land levels, or overcome coastal defences where these exist, or when waves overtop the coastline or coastal defences
- Pluvial - Flooding occurs when overland flow cannot infiltrate into the ground, when drainage systems exceed their capacity or are blocked and when the water cannot discharge due to a high water level in the receiving watercourse.

The flood zones extents have been prepared in accordance the Planning System and Flood Risk Assessment Guidelines identifying Flood Zones A, B and C. The flood zone maps are derived from the North Western CFRAM. These maps are the most comprehensive flood maps produced for Letterkenny since the introduction of the Guidelines and the Floods Directive.

The Flood Zone mapping is based on the best currently available data and a more detailed, site specific FRA may generate localised flood extents. The flood zones only account for inland and coastal flooding and are generated without the inclusion of climate change factors. They should not be used to suggest that any areas are free from flood risk as they do not account for potential flooding from pluvial and groundwater flooding.

8.3 FLOOD MANAGEMENT POLICIES & OBJECTIVES

The County Development Plan outlines flood risk management strategies and objectives that incorporate Flood Risk Management into the spatial planning of the County, to meet the requirements of the EU Floods Directive and the EU Water Framework Directive. Appropriate Flood Risk Management strategies and objectives are detailed in Section 6.1 and Section 6.2 respectively. Flood risk management will be carried out in accordance with the Flood Risk Management Guidelines for Planning Authorities, DOECLG (2009) and Circular PL2/2014. The North Western CFRAMS provide information in relation to known flood risk in Letterkenny. Development proposals on lands that may be at risk of flooding should be subject to a flood risk assessment, prepared by an appropriately qualified Chartered Engineer, in accordance with the Flood Risk Management Guidelines. Detailed flood risk assessments should be cognisant of possible pluvial flood risk and appropriate drainage proposals should be implemented to reduce the risk of pluvial flooding. Proposals for minor development to existing buildings in areas of flood risk (e.g. extensions or change of use) should include a flood risk assessment of appropriate detail.

8.4 SFRA REVIEW AND MONITORING

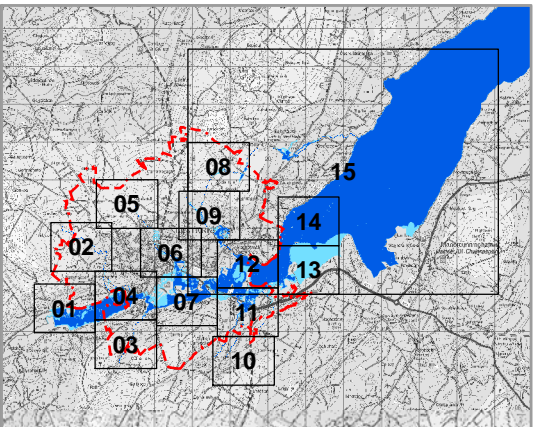
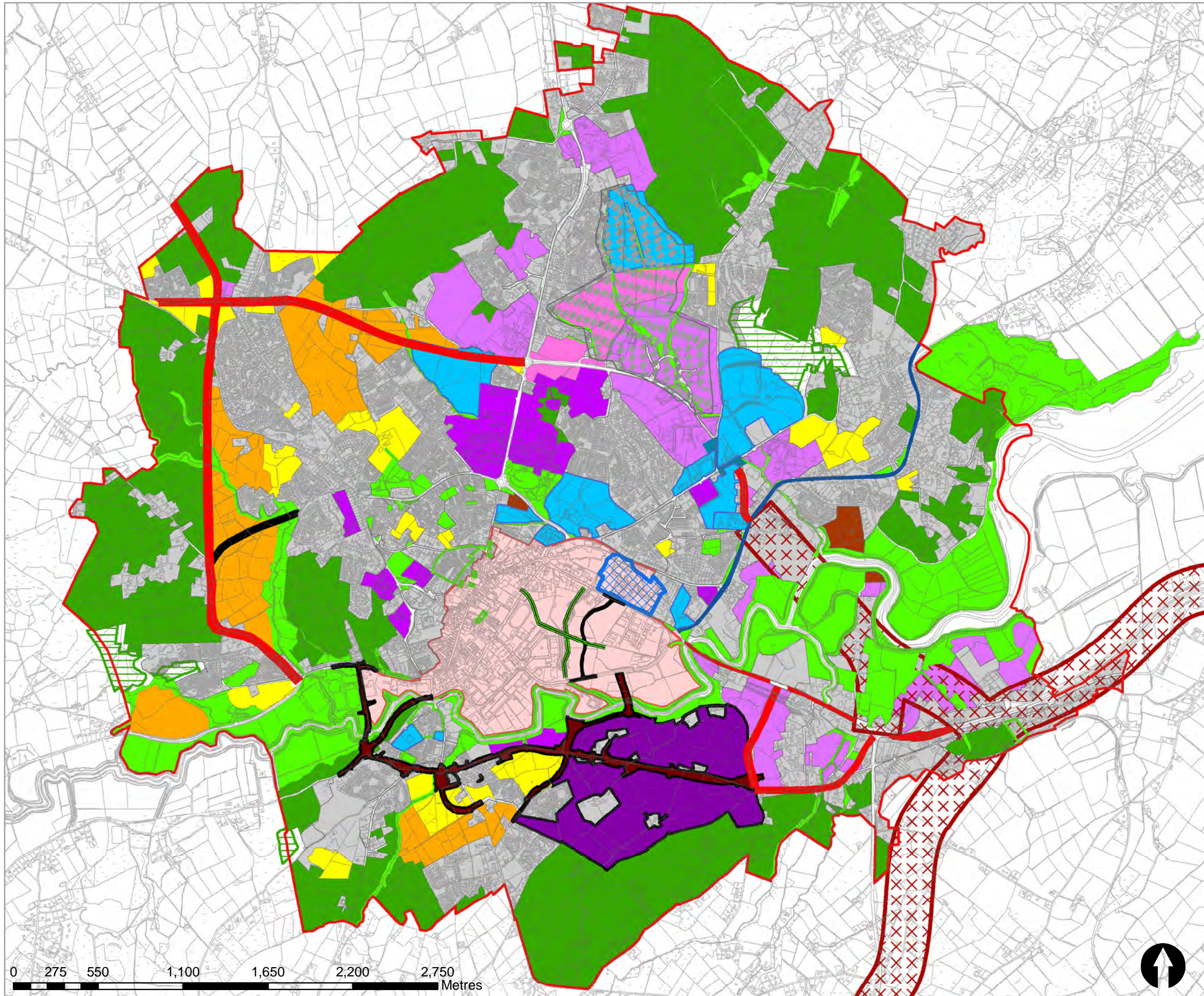
The DCC SFRA will be reviewed and updated every six years in line the County Development Plan review process. Additionally, outputs from future studies and datasets may trigger a review and update of the SFRA during the lifetime of the Local Area Plan. Other sources of information may not lead to an update of the SFRA during the lifetime of the plan but they should be retained and collected to supplement the future County SFRA's.



APPENDICES

Appendix A

Letterkenny LAP Zoning and Flood Zones



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- LAP Boundary
- Letterkenny Green Connect
- Strategic Road Corridor
- Masterplanned Approach
- Southern Network Project
- Developer Led
- Opportunity Site
- Primarily Residential
- Proposed Upgraded Urban Roads
- Services
- Strategic Residential Reserve
- Strategic Community Opportunity
- Southern Strategic & Sustainable Development Site
- Proposed Natural Heritage Area
- Open Space
- LYIT Campus
- Long Established Residential Area
- Local Environment
- Letterkenny TEN T
- Junction Reserve
- General Employment
- Established Development
- Community Education
- Town Centre

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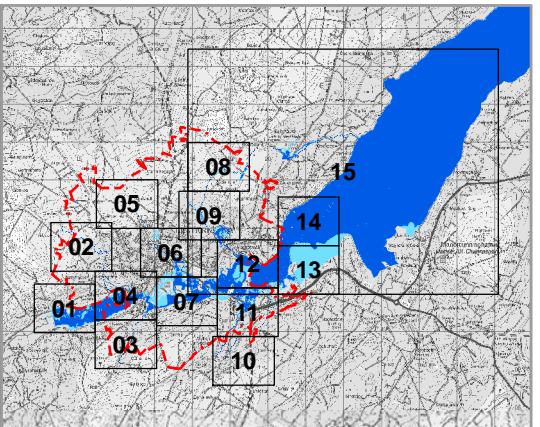
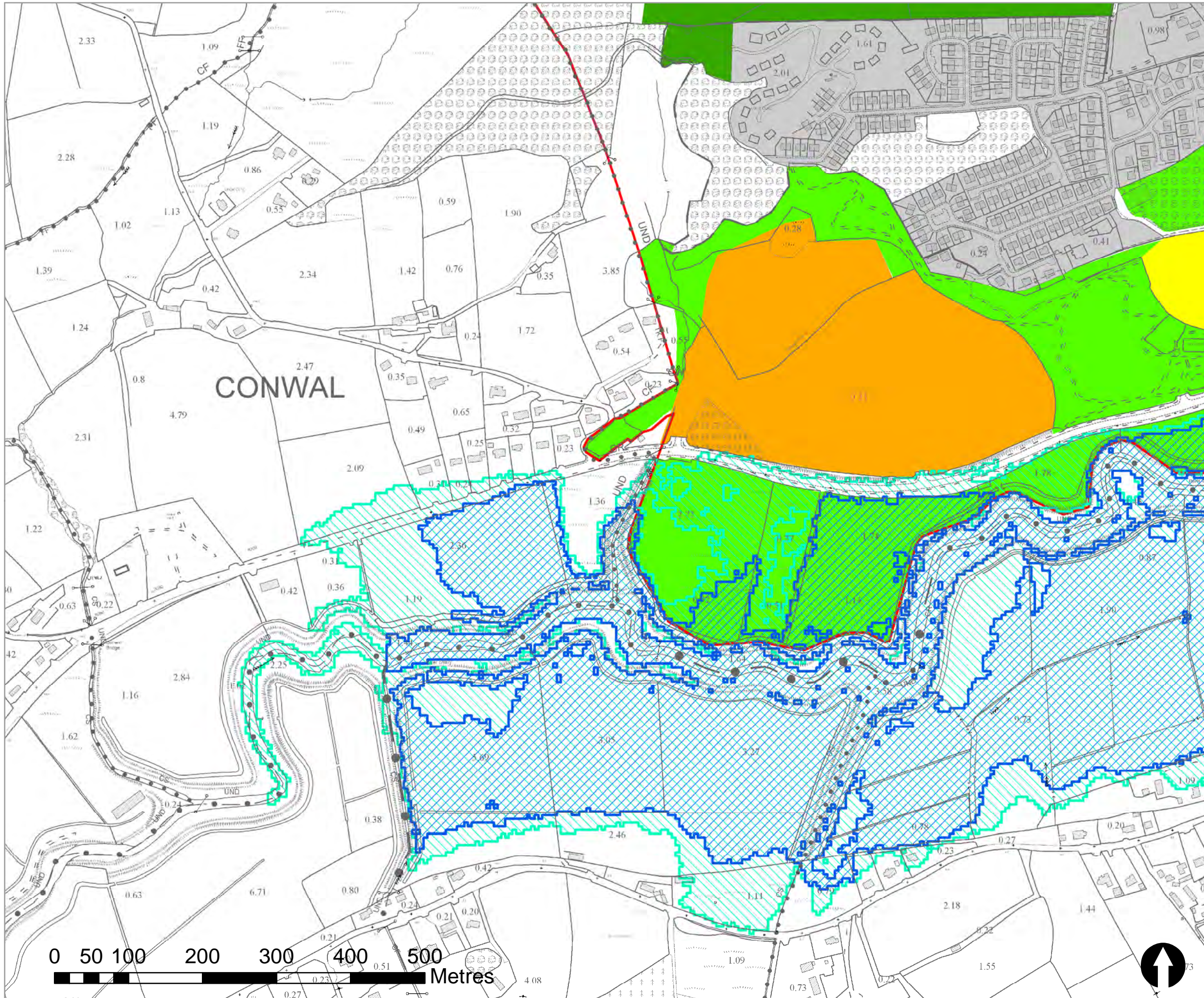
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TITLE
Letterkenny Flood Zones
In relation to LAP Land Use Zones

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- Flood Zone A
- Flood Zone B
- LAP Boundary
- Primarily Residential
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- Open Space
- Local Environment
- Established Development

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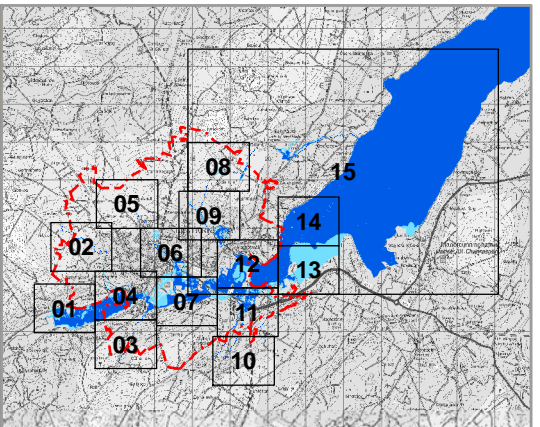
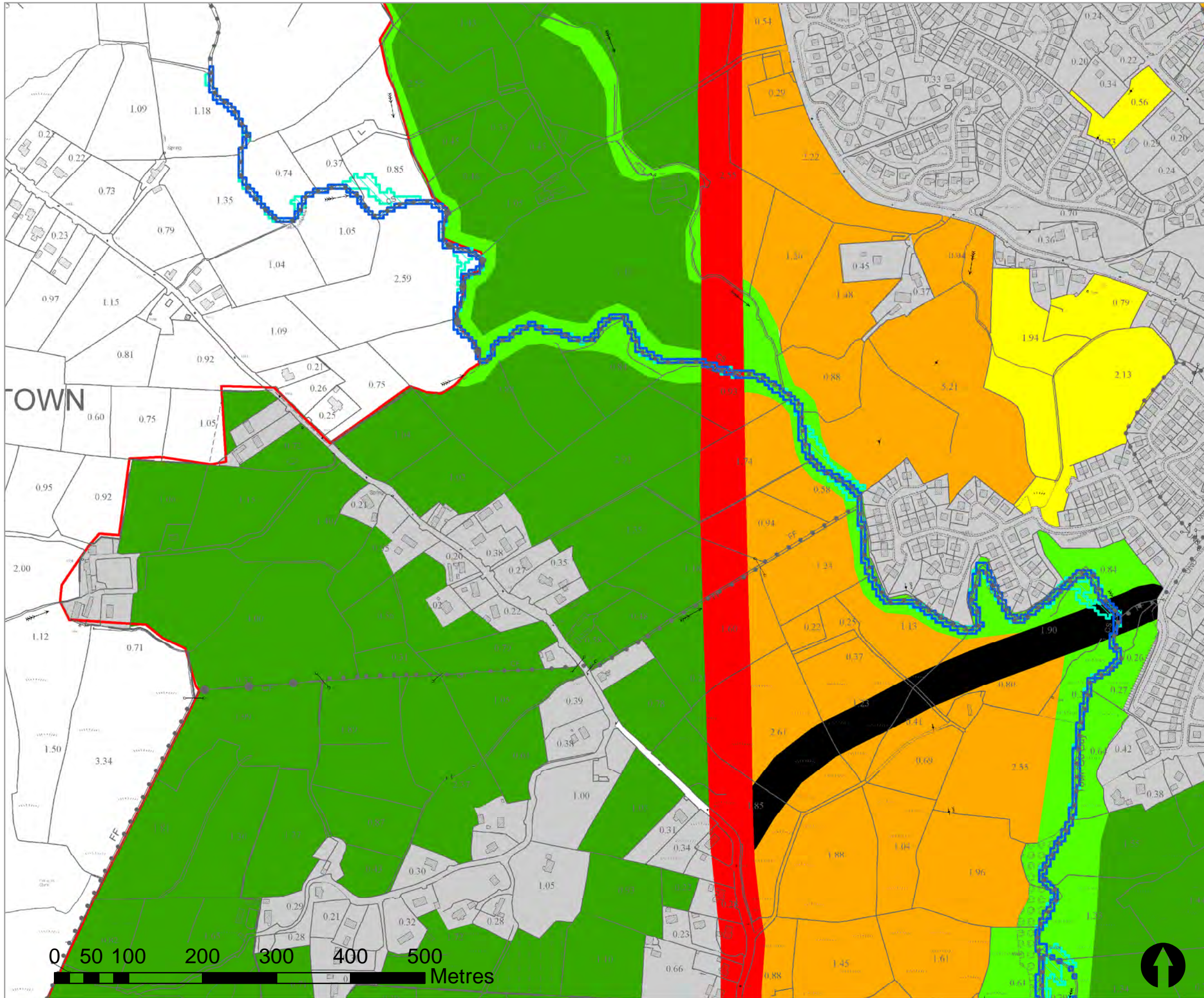
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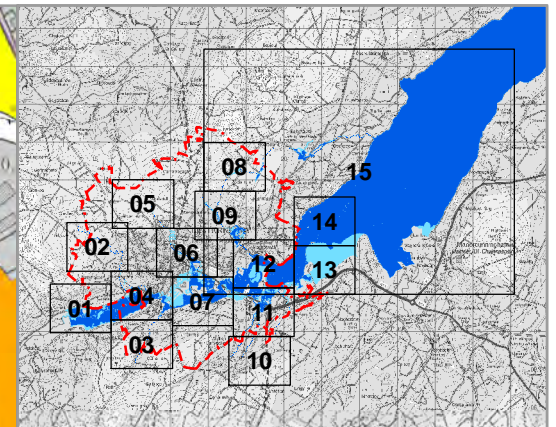
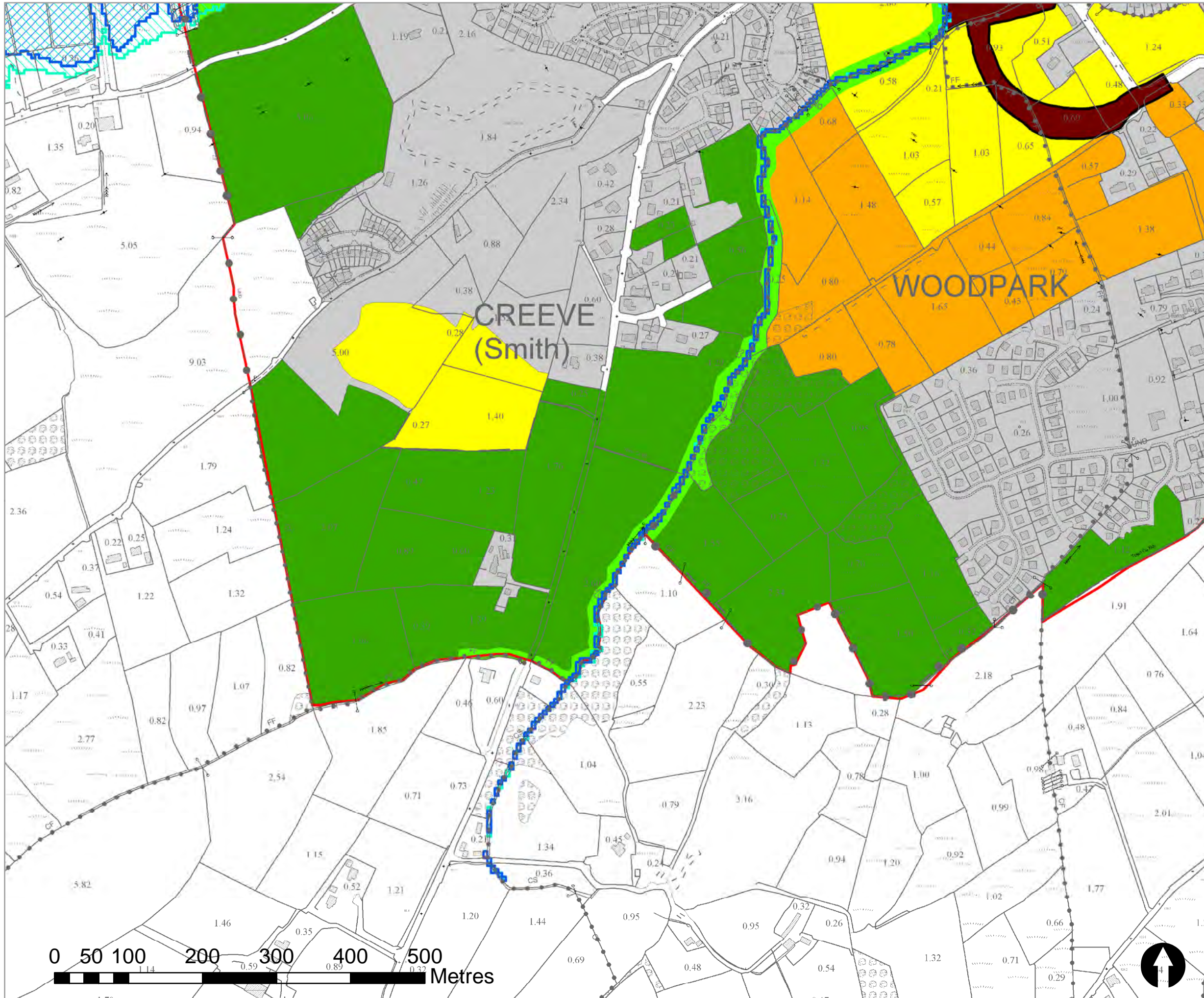
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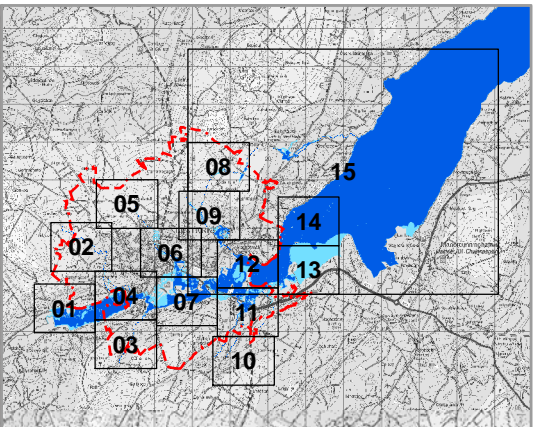
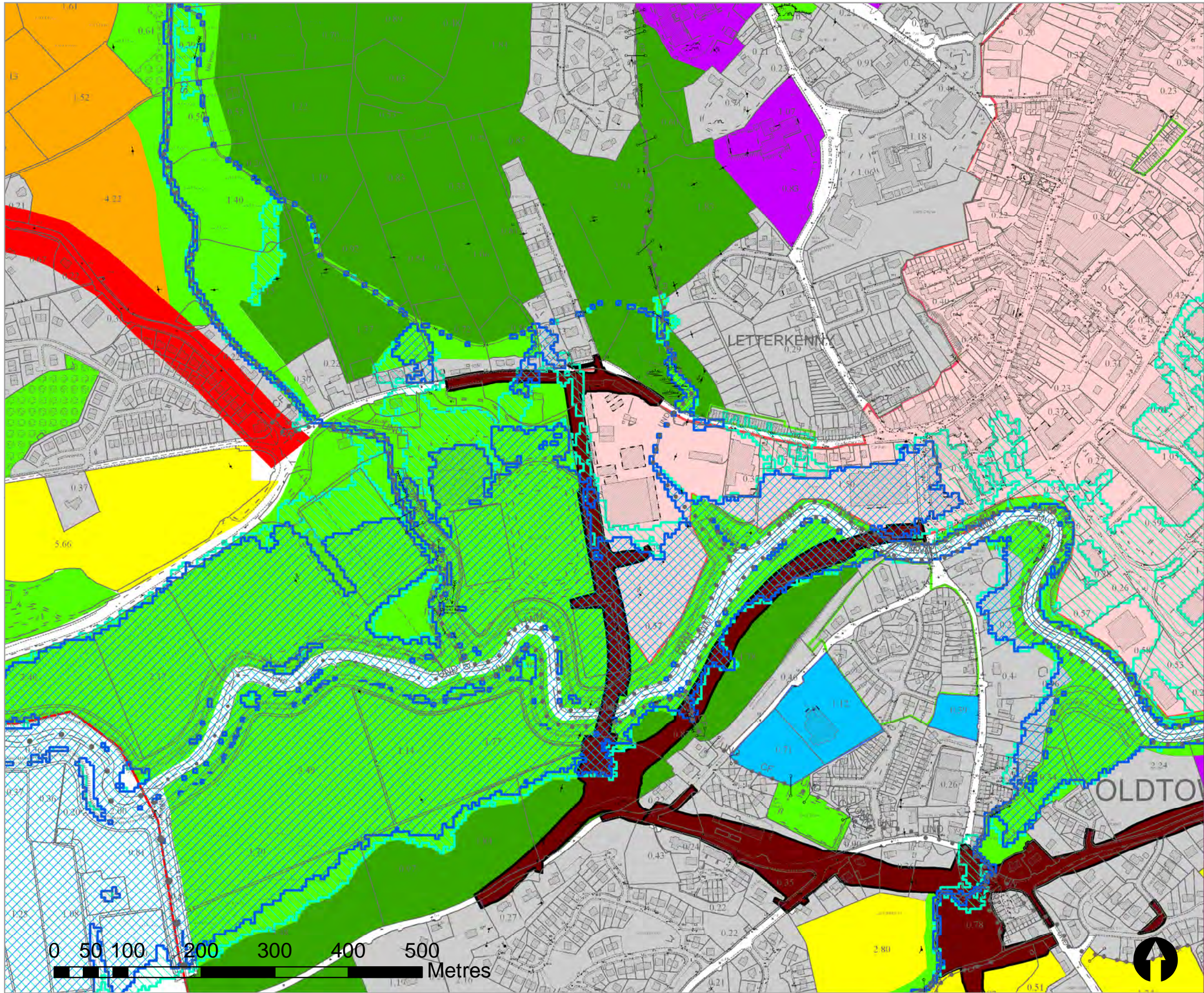




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- Strategic Road Corridor
- Southern Network Project
- Opportunity Site
- Primarily Residential
- Strategic Residential Reserve
- Open Space
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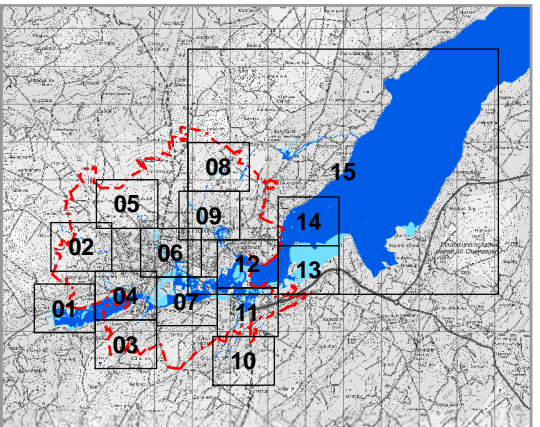
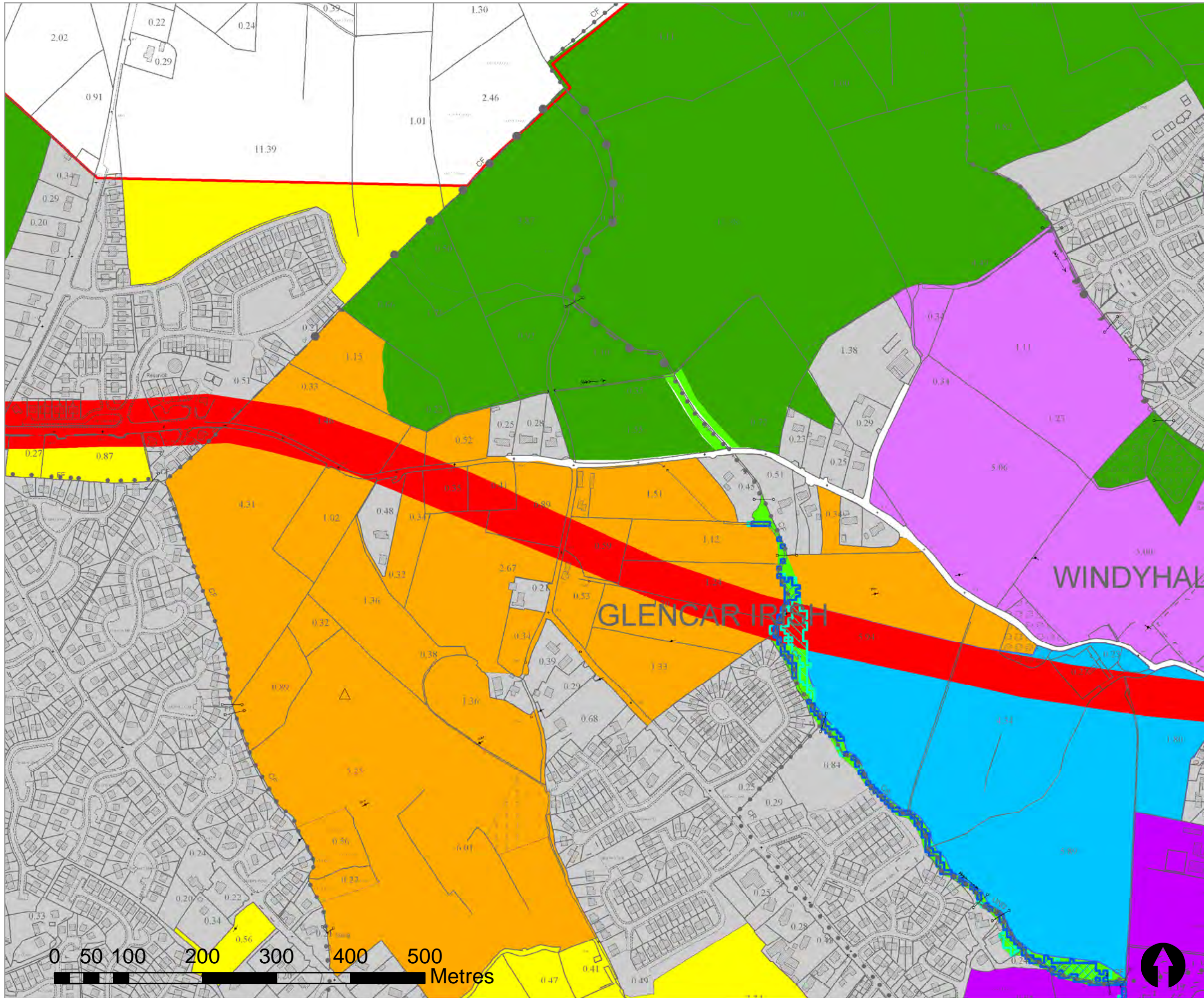
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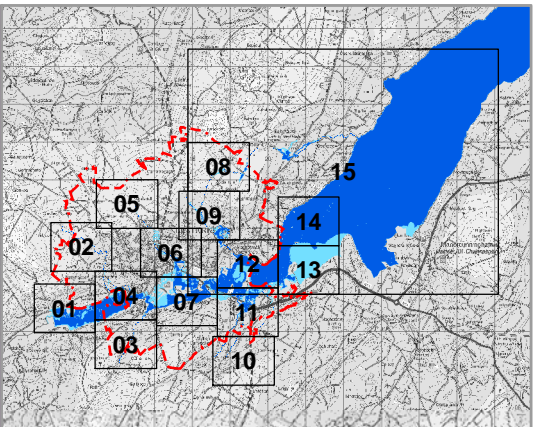
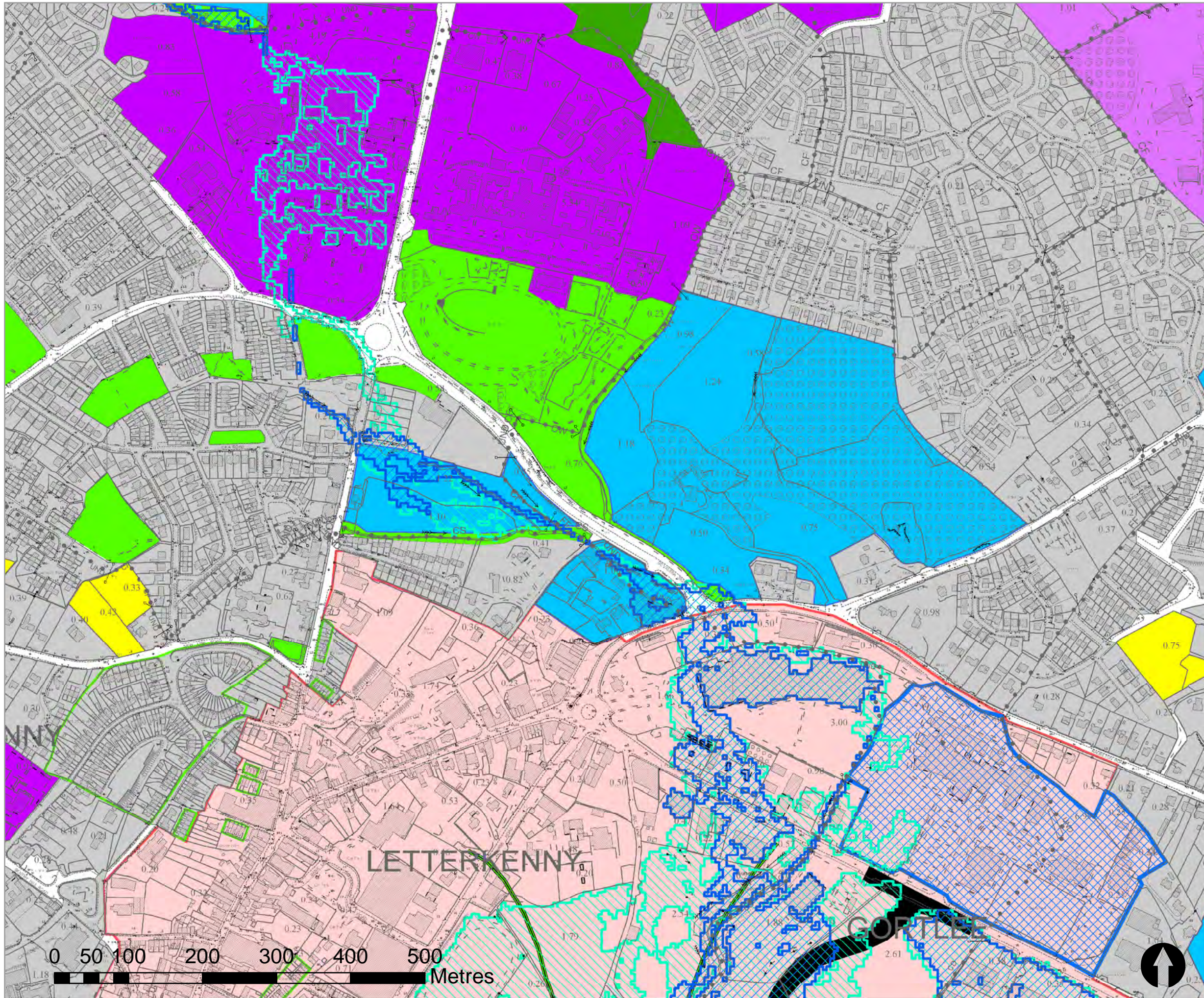
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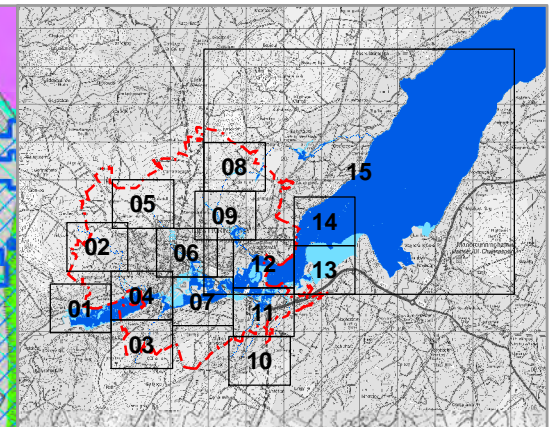
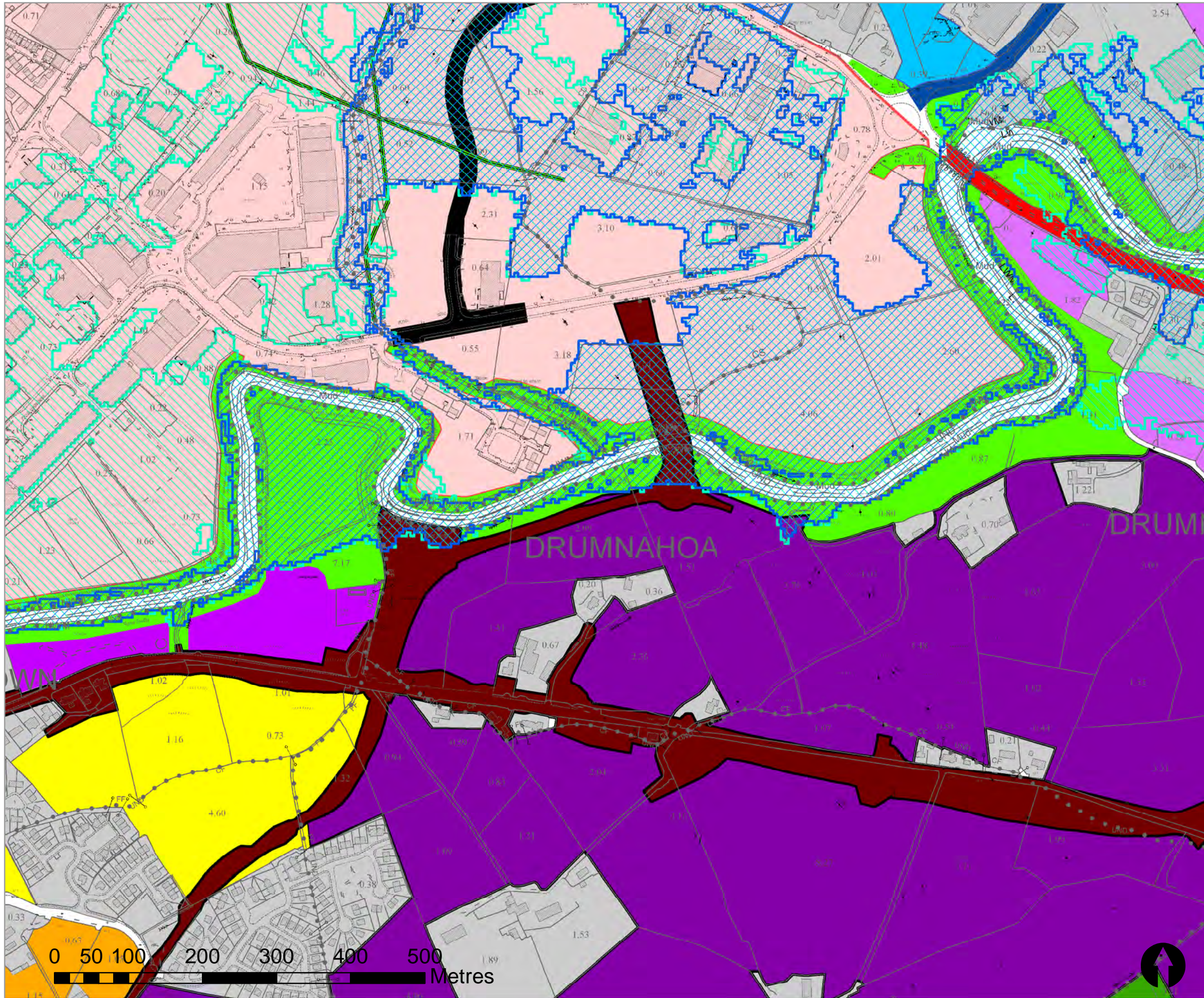
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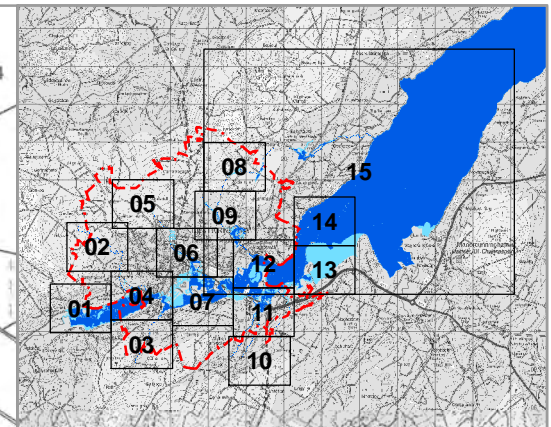
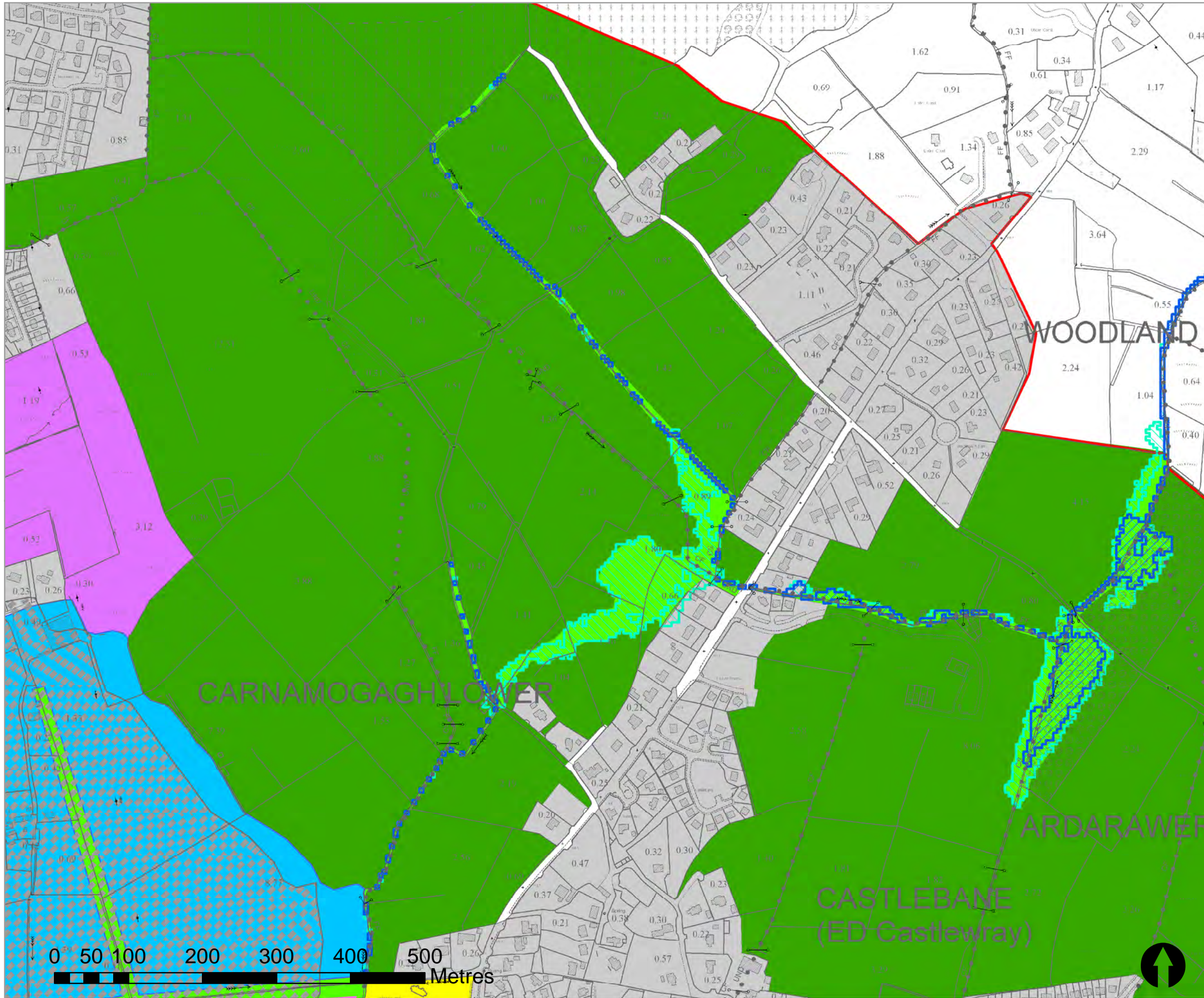
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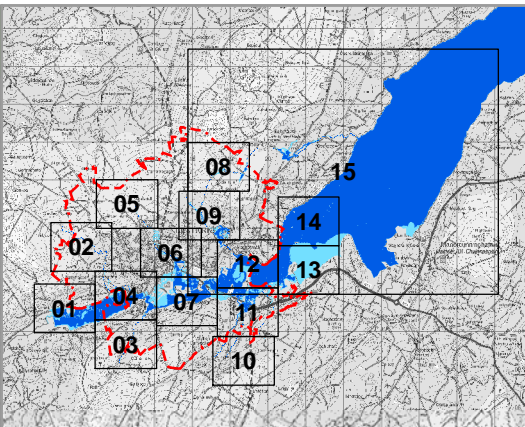
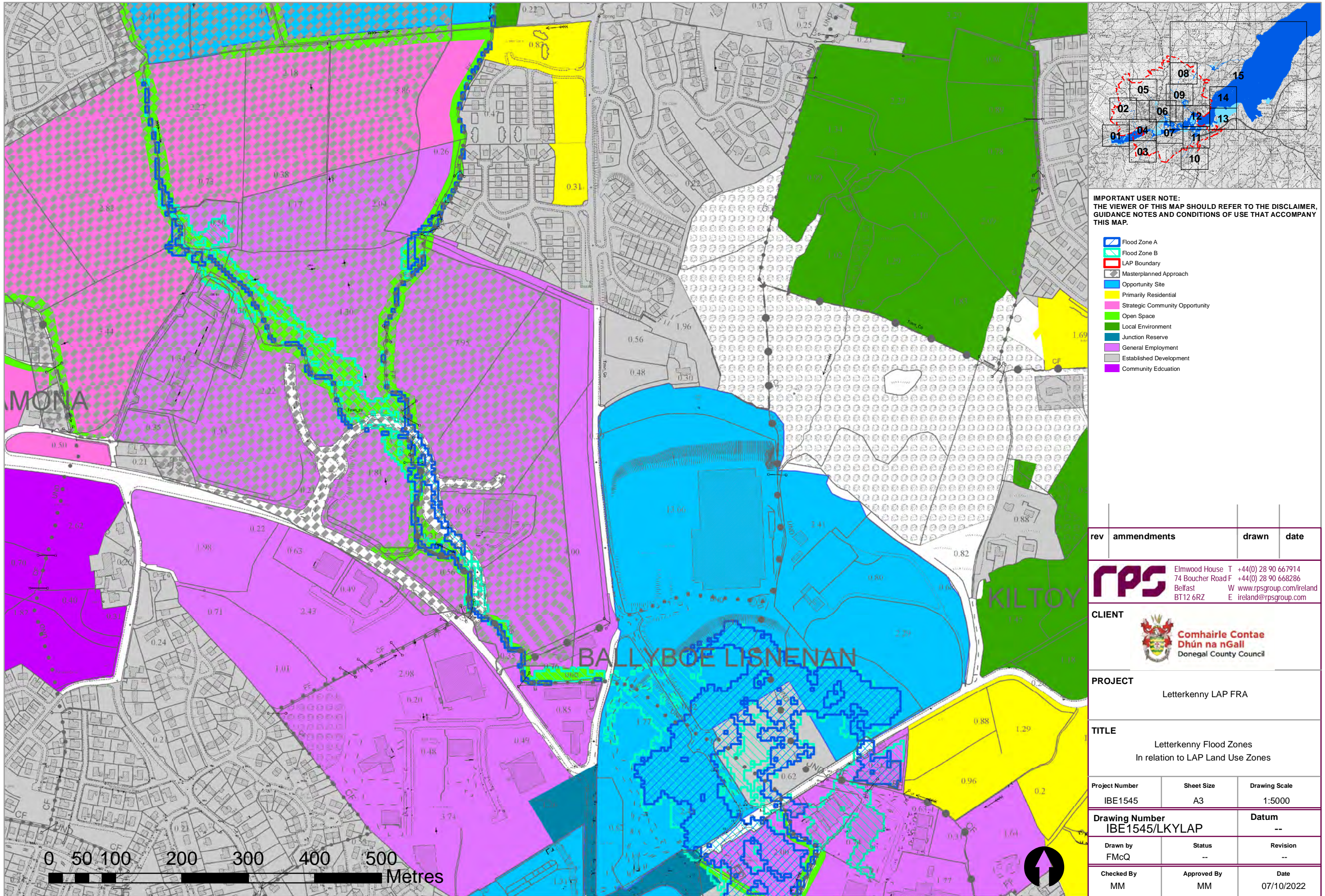
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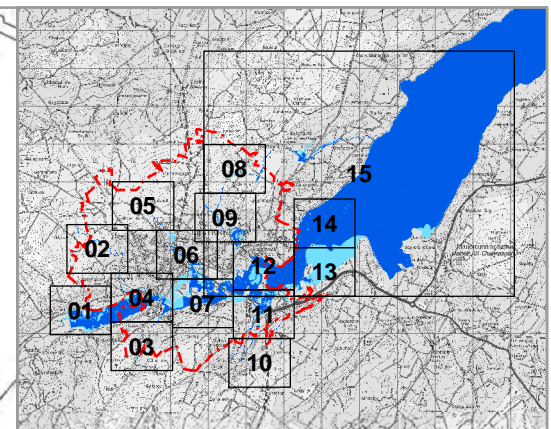
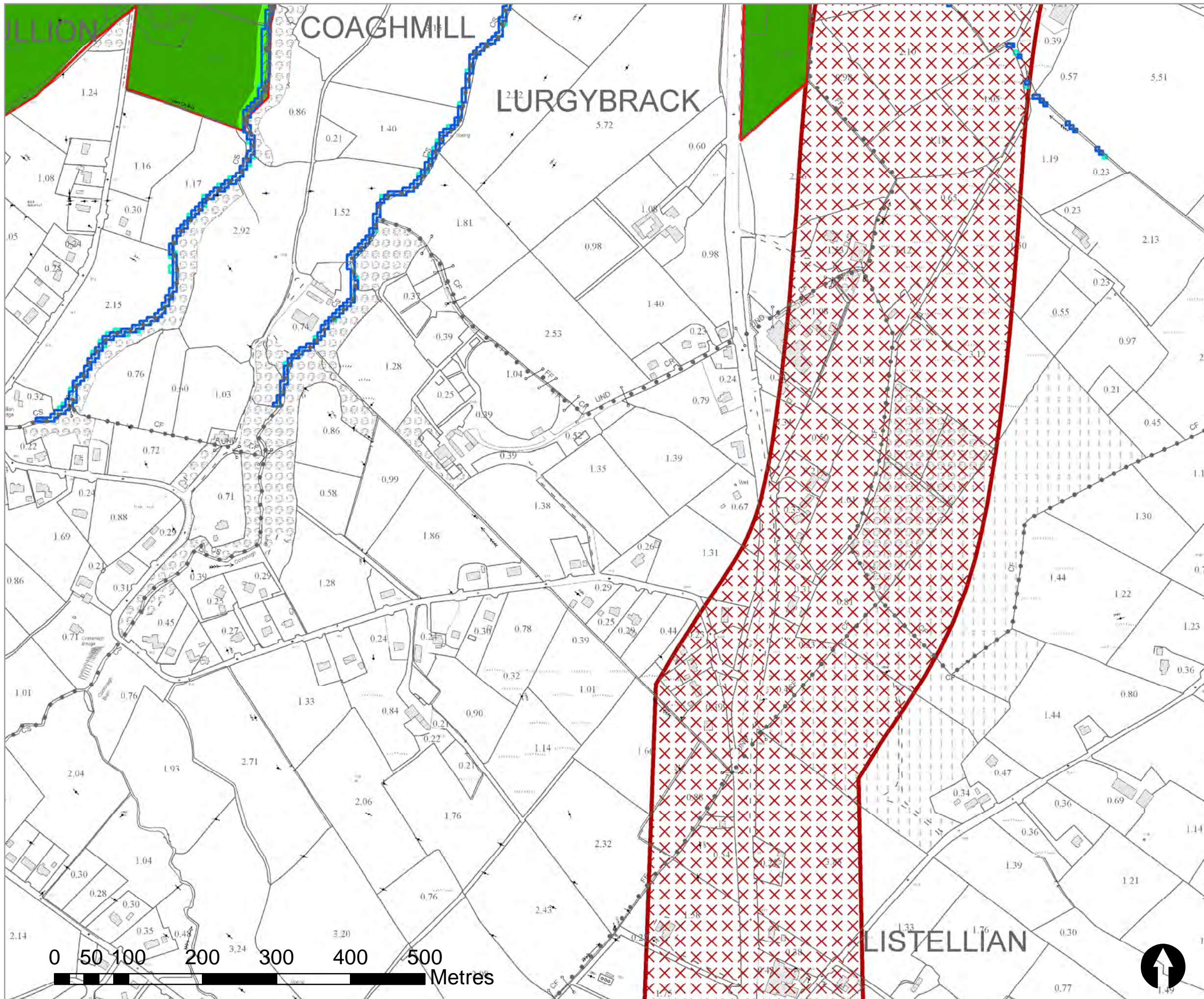
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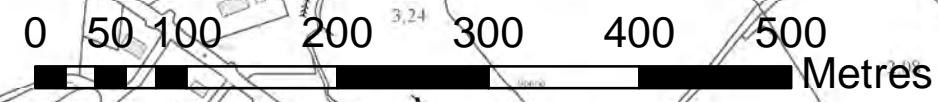
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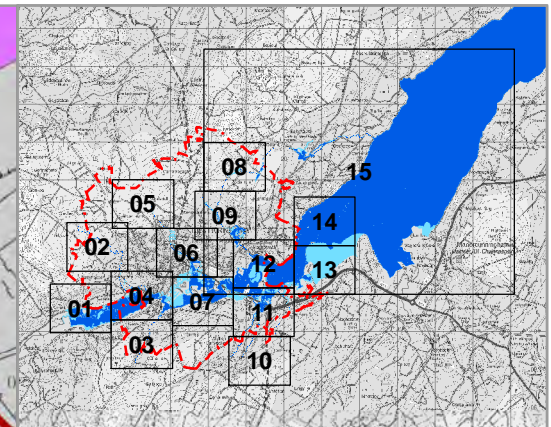
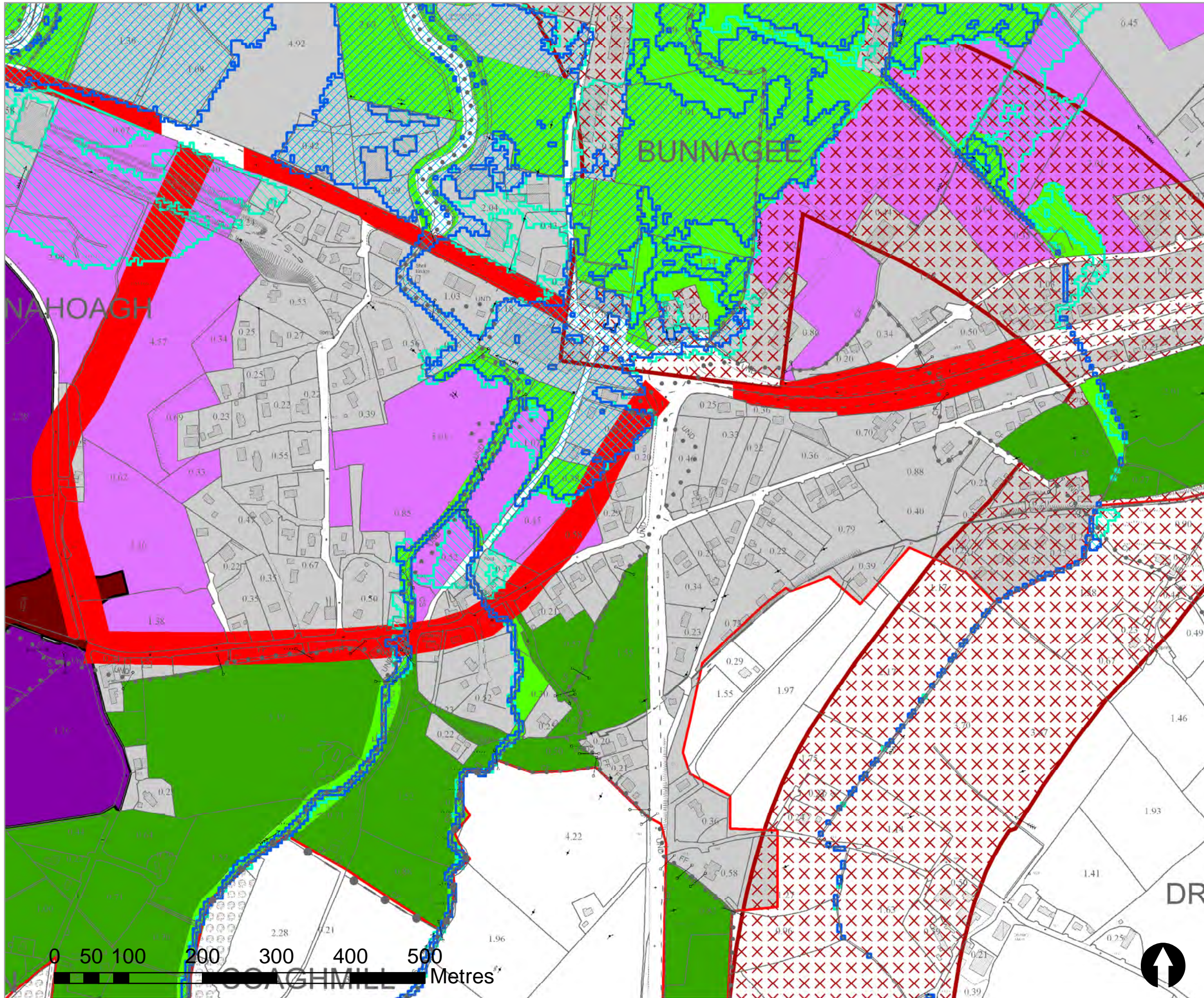
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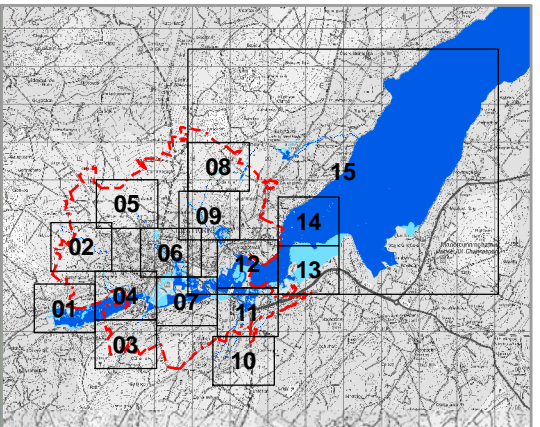
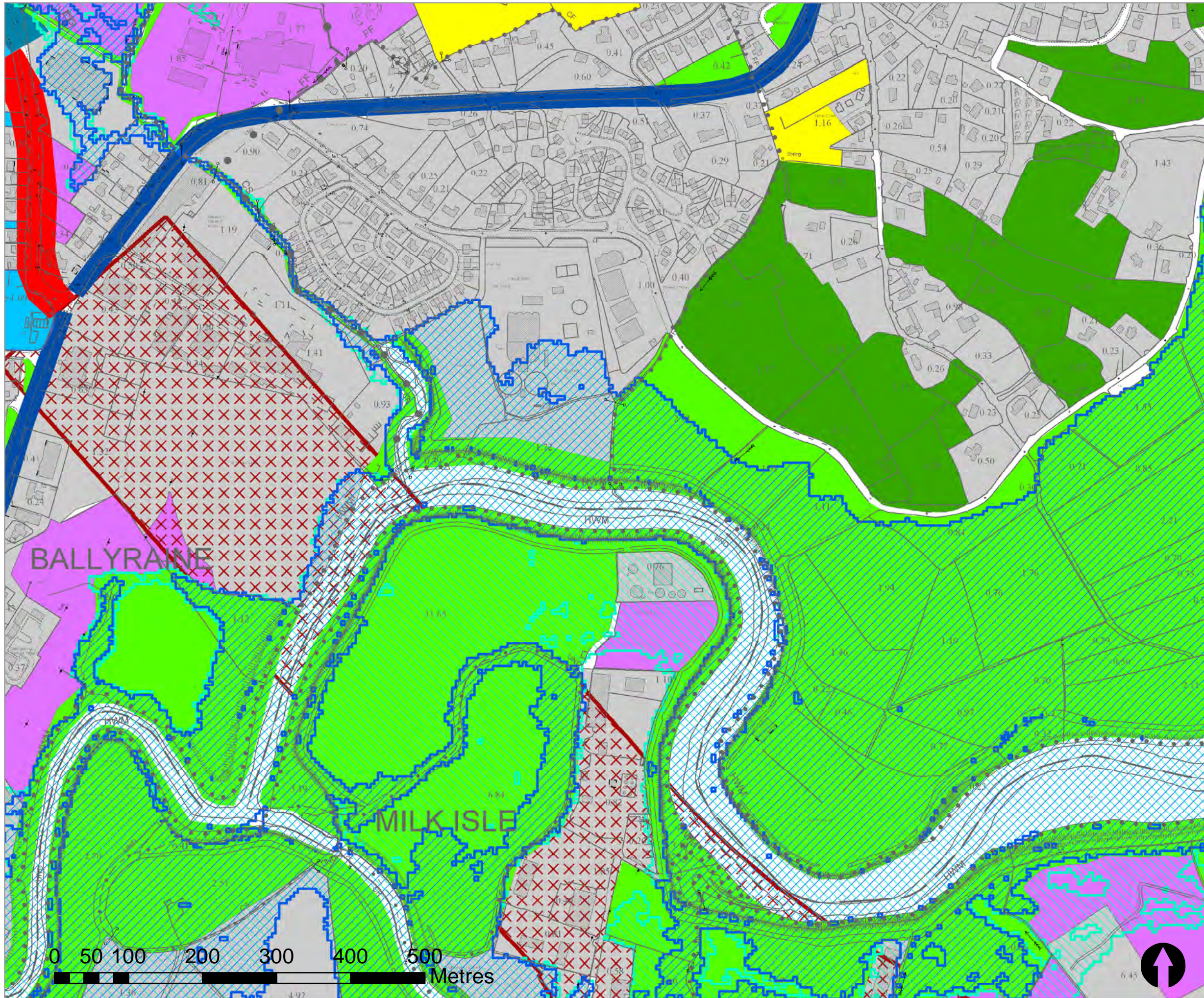
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 Donegal County Council

PROJECT
 Letterkenny LAP FRA

TITLE
 Letterkenny Flood Zones
 In relation to LAP Land Use Zones

Project Number IBE1545	Sheet Size A3	Drawing Scale 1:5000
Drawing Number IBE1545/LKYLAP	Datum --	
Drawn by FMcQ	Status --	Revision --
Checked By MM	Approved By MM	Date 07/10/2022



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

- Flood Zone A
- Flood Zone B
- LAP Boundary
- Strategic Road Corridor
- Opportunity Site
- Primarily Residential
- Proposed Upgraded Urban Roads
- Open Space
- Local Environment
- Letterkenny TEN T
- Junction Reserve
- General Employment
- Established Development

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PROJECT
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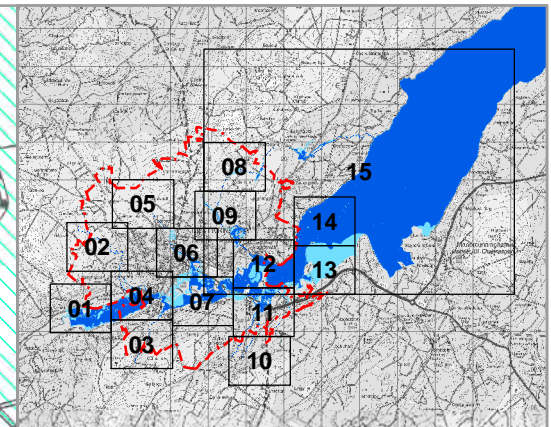
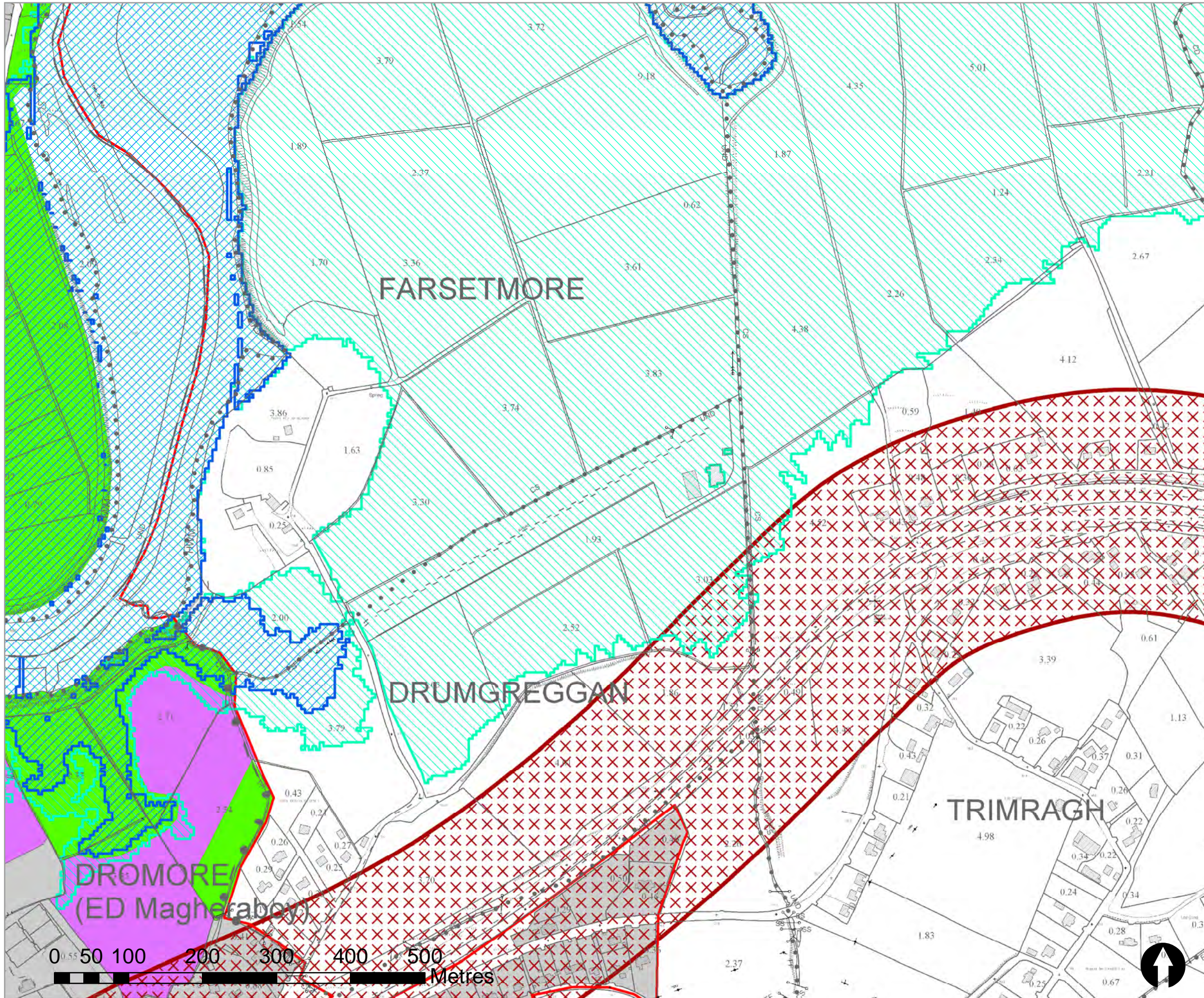
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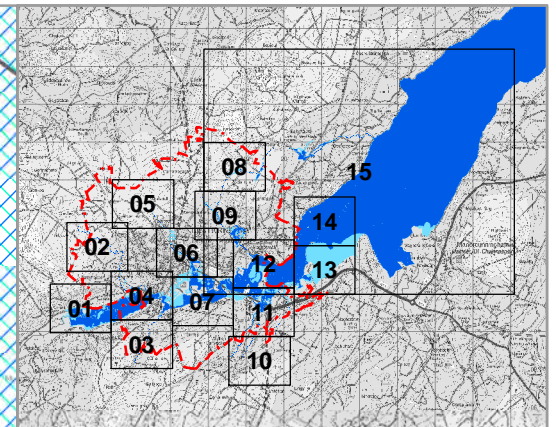
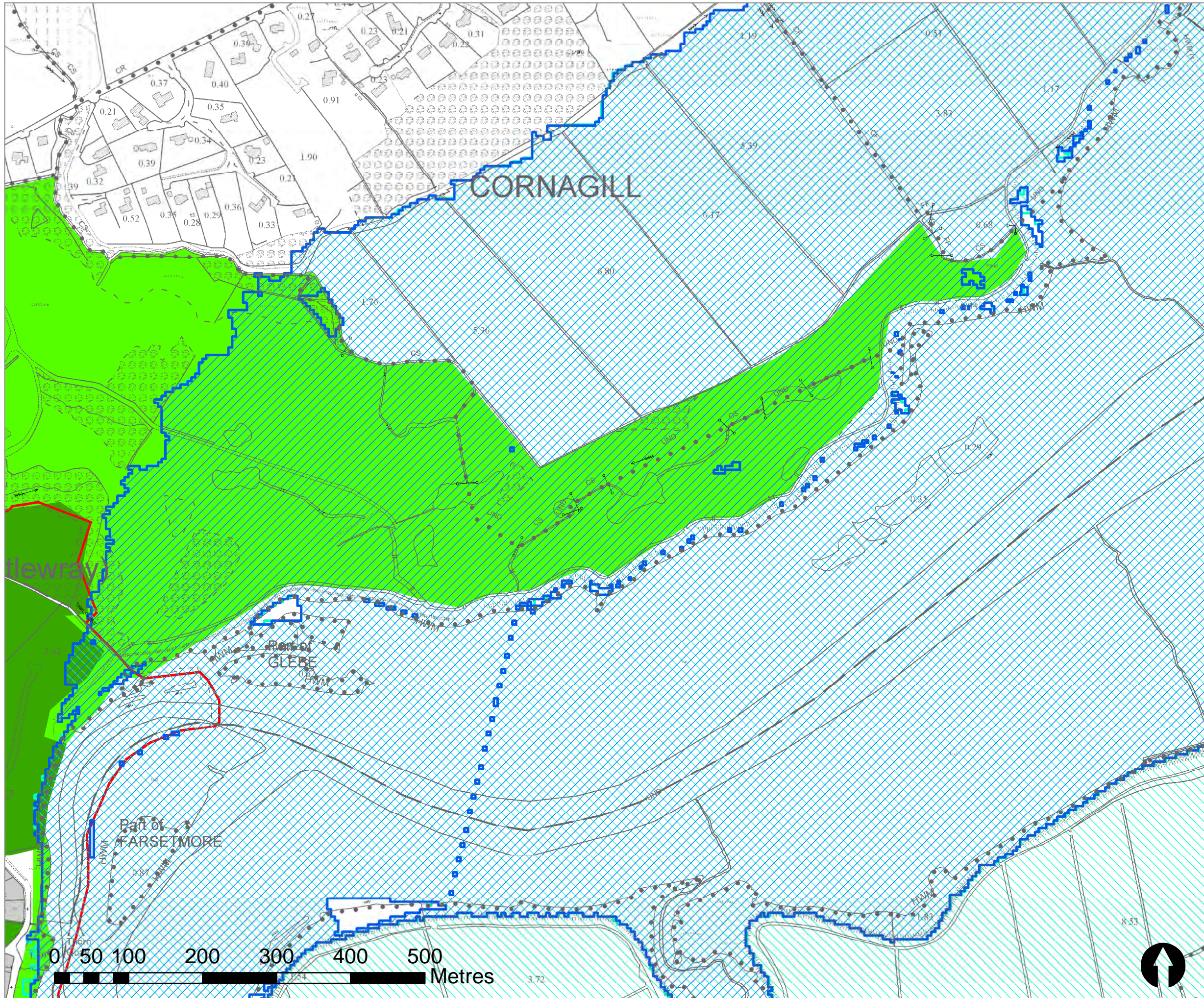
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- Flood Zone B
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Drawn by	Status	Revision
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Checked By	Approved By	Date
MM	MM	07/10/2022

Appendix B
Justification Tests

Appendix B - Justification Tests

A SFRA has been carried out as part of the assessment of the proposed Local Area Plan for Letterkenny. The SFRA outlines how the zoning proposed in the LAP can be adequately managed.

The SFRA identifies a number of locations where the vulnerable and less vulnerable land use zonings coincide with areas which are at risk of flooding. In accordance with guidelines the sequential approach has been adopted and where avoidance or substitution of land use is not possible a justification test should be carried out to assess the appropriateness of the zoning in these flood risk areas. If still deemed appropriate the Justification Test should outline flood risk management measures to ensure that flood risk is not increased in the areas and to other adjoining areas. These include existing highly vulnerable development in Flood Zones A and B and existing less vulnerable development in Flood Zone A.

The areas within the Letterkenny Area Plan that are at flood risk which coincide with vulnerable and less vulnerable land use zonings have been identified and are illustrated in Appendix A and Section 6 of the main report.

A justification test is required where avoidance or substitution is not possible to review the appropriateness of the land use following 'The Guidelines' sequential approach as outlined in the tables below. The SFRA has used the flood risk mapping from the North Wester CFRAM study but has also undertaken more detailed modelling for specific locations to demonstrate the zoning proposed in areas of flood risk is in compliance with the Guidelines and part 3 of the justification test. Detailed modelling will also be necessary during the development stage FRA for developments brought forward in these areas.

In applying the Justification Test Part 3, consideration has been given to structural and non- structural measures identified in the SFRA which may be required prior to further development taking place. As such, in most of these built-up areas, flood risk can be addressed through requiring a site-specific flood risk assessment which will identify appropriate mitigation measures such as retaining flow paths, flood resilient construction and emergency planning.

Justification Test for zoning and objectives in the proposed variation of the Donegal County Development Plan 2018-2024 in respect of the TEN-T PRIPD in areas of flood risk in Zone A and /or B

Criteria	Response
<p>1. The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act 2000, as amended.</p>	<p>The urban settlements related to the TEN-T PRIPD are targeted for growth under the National Planning Framework, the Regional Spatial and Economic Strategy for the Northern and Western Regional Assembly Area 2020-2032 and the County Donegal Development Plan 2018-2024. In particular:</p> <ul style="list-style-type: none"> • Letterkenny is identified as a Regional Centre in the National Planning Framework and the Regional Spatial and Economic Strategy. Such centres are identified in the NPF to lead the development of their regions. <p>The TEN-T PRIPD is supported by a number of policies across international, national and regional strategic planning documents and its strategic importance to the County is highlighted by the fact that</p> <ul style="list-style-type: none"> • Article 4 of EU Regulation 1315/2013 highlights that the TEN-T network “shall strengthen the social, economic and territorial cohesion of the Union” and shall support “inclusive growth”. It shall demonstrate European added value by contributing to objectives set out in the Regulations • Enhanced Regional accessibility, including upgrading access to the North West utilising routes such as the N14 and progressive development of the Atlantic Economic Corridor Northwards by upgrading the N15/N13 link, is a National Strategic Outcome of the National Planning Framework Project Ireland 2040. • The “N13/N14/N56 Letterkenny Bypass and Dual Carriageway to Manorcunningham” is listed as a priority for investment within the NDP 2018-2027. • It is an objective of the Regional Spatial and Economic Strategy for the Northern and Western Regional Assembly Area to deliver the project by 2028. (Objective RPO 3.7.30 of said document refers). • The project is fundamental to both the success of the North West City Region and enhanced transport connectivity between Ireland and Northern Ireland, each of which in turn are National Policy Objectives of the National Planning Framework (NPO 45 and 46 of said document refers).
<p>2. The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular:</p>	

	Criteria	Response
2(i)	Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement:	<p>The purpose of the proposed variation is to facilitate the TEN-T PRIPD, a strategic roads project whose geographical scope covers both urban and rural areas in east Donegal. As such the project is not specifically designed to facilitate the regeneration and/or expansion of the centre of a specific urban settlement. Nevertheless the project will facilitate the regeneration and expansion of the urban areas of Ballybofey/Stranorlar, Letterkenny and Lifford by:</p> <ul style="list-style-type: none"> • Alleviating traffic congestion and associated air and noise pollution and thus enhancing the overall viability and quality of life in core of said urban settlements. • Removing strategic traffic from said urban settlements thus freeing up space for sustainable transport modes and urban improvements in said urban settlements. • Supporting the expansion of said urban settlements by facilitating economic growth and allowing Donegal to successfully compete for inward investment by improving the efficiency and capacity of the road network including improving journey time and journey time reliability at a local, regional and national level.
2(ii)	Comprises significant previously developed and/or under-utilised lands:	As stated, the TEN-T PRIPD is a strategic roads project whose geographical scope covers both urban and rural land in east Donegal as such is it not specifically intended to re-develop previously developed and/or utilized lands. However some of the Section 2 – N56/N13 Letterkenny to Manorcunningham Preferred Route Corridor does incorporate underutilized lands.
2(iii)	Is within or adjoining the core of an established or designated urban settlement:	The TEN-T PRIPD is a strategic roads projects aimed at upgrading and improving parts of the TEN-T strategic road network in Donegal and the associated Preferred Route Corridors have been chosen to on the basis, inter alia, that they would enhance the functionality and carrying capacity of the road network. Accordingly the corridors are not within, and do not adjoin, the cores of designated urban settlements.
2(iv)	Will be essential in achieving compact and sustainable urban growth;	<p>As a strategic roads project the TEN-T PRIPD is not specifically aimed at achieving compact and sustainable urban growth. However by removing strategic traffic from the urban settlements of Ballybofey/Strannorlar, Letterkenny and Lifford the project will promote sustainable urban growth by:</p> <ul style="list-style-type: none"> • Alleviating traffic congestion, and associated air and noise pollution and thus enhancing the overall viability and quality of life in these urban settlements. • Removing strategic road traffic from these urban settlements thus freeing up space for sustainable transport modes and urban improvements.
2(v)	There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.	<p>Section 2: N56/N13 Letterkenny to Manorcunningham Preferred Route Corridor</p> <p>This section contains the following locations identified in Section 6.2 and Figure 6-2 at which said corridor traverses flood risk areas:</p> <ol style="list-style-type: none"> 1. River Swilly/Lough Swilly and tributaries at Letterkenny; <p>The section of the preferred route corridor that is in an area of</p>

flood risk is predominantly the 2.5km strategic link connecting to the existing N56/R245 junction northeast of the Polestar roundabout in Letterkenny. This is a key link to achieving the objectives of the project.

In total there were 39 different options or variations of the same option considered in Stage 1 Preliminary Options Assessment process as illustrated in the preliminary options drawing below (Figure 1 taken from the Phase 2 option selection report).

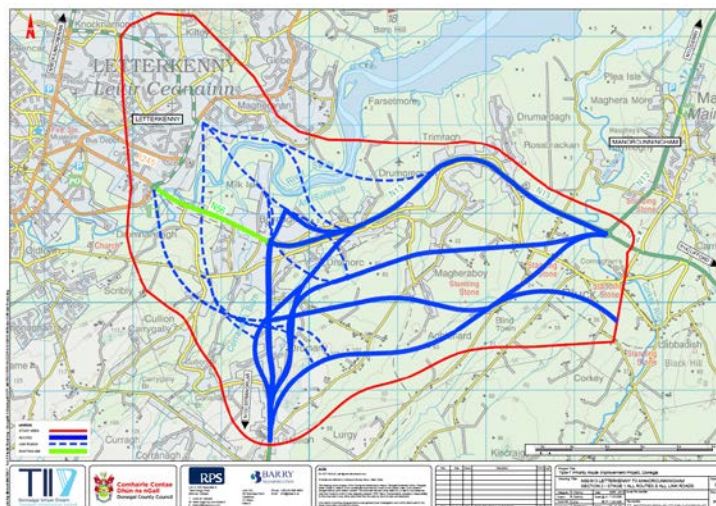


Figure 1: Stage 1 preliminary options considered for Section 2

Eleven of these options were discounted immediately as they did not achieve one of the key objectives for the TEN-T PRIPD which was to provide a link road into Letterkenny. Of the remaining 28 options there were varying lengths of road within the flood plain (1% AEP) ranging from 55m to 220m.

The Stage 1 assessment using the criteria of Environment, Engineering and Economy, resulted in seven shortlisted options, shown in Figure 3 below, which were brought forward to the Stage 2 assessment process. In addition, three Letterkenny link options were carried forward for continued assessment. As outlined above all options considered for the link road that were taken forward from the stage 1 preliminary option assessment into the Stage 2 route corridor appraisal traversed the areas of flood risks (Figure 2).

The preferred route corridor identified through the Stage 2 Options Assessment process (Option 2D) traversed 90m of floodplain which in terms of flood risk was only bettered by 2 other options (2 variations of the yellow option in the preliminary option assessment report).

However these other options were considered unsuitable for the following reasons and were eliminated during the Stage 1 preliminary option assessment:

1. The number of roads and strategic services crossed;
2. A less favourable alignment with almost double the volume of earthworks (cut and fill balance) required;
3. Landscape and Visual impacts;

Criteria

Response

- 4. Archaeology /Cultural Heritage;
- 5. Agriculture
- 6. The number of Residential Properties affected.

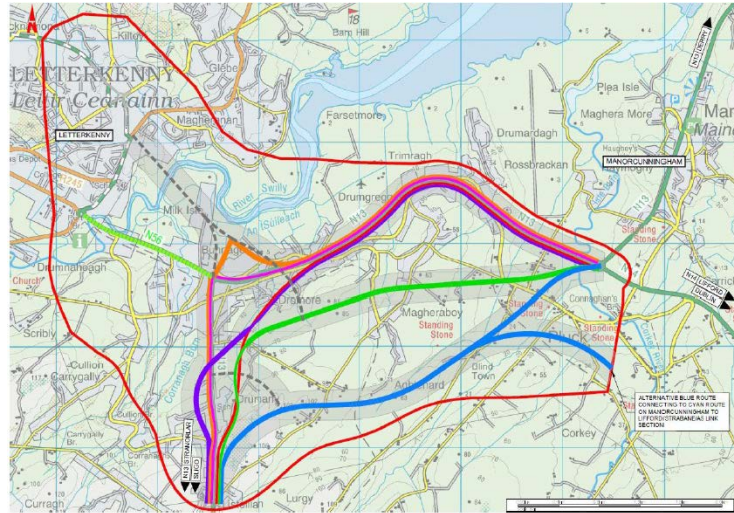


Figure 2: Stage 2 options considered for Section 2

Consequently there were no other suitable alternative routes in areas at lower risk of flooding that could have been selected for the Section 2 Preferred Route Corridor.

Note: Full details of the option selection process can be found in the Stage 2 option selection report and associated supporting information (<http://www.donegal-ten-t.ie/pages/documents/downloads/options-selection-report.php>)

3. A flood risk assessment to an appropriate level of detail has been carried out as part of the SFRA for the proposed variation to the CDP 2018-2024 in respect of the TEN-T PRIPD, which demonstrates that flood risk to the strategic road corridors can be adequately managed, and the use or development of the lands will not cause unacceptable adverse impacts elsewhere. The findings

N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant detailed flood risk assessment.

A SFRA has been carried out as part of the assessment of the proposed variation to the CDP 2018-2024 in respect of the TEN-T PRIPD. The SFRA outlines how the zoning of these development can be adequately managed. As this zoning has already been assessed for this variation the incorporation into the Letterkenny LAP is based on the findings of the SFRA carried out for that variation. The elements relevant to the Letterkenny LAP are reproduced below. In particular this SFRA has noted that:

- 1 The proposed Bonagee link road for Letterkenny town in Section 2 crosses the River Swilly Channel. The Swilly river channel is approximately 55m wide at this location. Furthermore, much of this link road passes through the floodplains of the Swilly River;

In addition to the locations where the TEN-T PRIPD Preferred Route Corridor traverses areas which are at significant risk of flooding there are also minor watercourses which must be

Criteria	Response
	<p>traversed. Given the linear nature of the TEN-T PRIPD road scheme and the linear nature of these water courses there were no suitable alternatives to crossing these minor watercourses. For these minor water courses managing the flow of water by culverting beneath the proposed road or small span bridges will be readily achieved and will not represent a significant flood risk, acknowledging that section 50 of the Arterial Drainage Act will still need to be complied with.</p> <p>It has been demonstrated that there are no other suitable alternatives in areas of lesser flood risk in these areas. Construction of these sections of the TEN-T PRIPD could pose significant flooding risk to the adjacent lands and properties, both during the construction and post construction stages of the works. However it is recommended that the following measures be implemented to ensure that the strategic road does not give rise to unacceptable adverse impacts elsewhere:</p> <ul style="list-style-type: none"> ▪ The infilling of floodplains for construction of any kind should be avoided where possible. Where this is not possible and the other criteria for the justification test is met, the mitigation for the strategic roads will include <ul style="list-style-type: none"> - Spanning the flood plains is a possible option so long as adequate freeboard is provided and it can be proven that any supports required in the flood plain have a negligible effect on the displacement of flood waters. - Flood relief culverts through road embankments may also be an option to allow flood waters to reach their natural flood extents. ▪ A detailed hydraulic model for the associated river channel and floodplains should be carried out at development management stage to assess this impact and appropriate mitigation measure should be implemented. ▪ The detailed FRAs for the preferred option should demonstrate that road level is designed for the 0.1% AEP level plus suitable freeboard. The recommended level of freeboard is 500 mm for fluvial flood levels. ▪ The detailed FRAs should also examine residual risk associated with culvert blockages, defence failure and climate change to set final road levels where appropriate. The FRAs should ensure development of the strategic roads do not block flow paths, does not increase flood risk elsewhere, is designed to appropriate standard of flood resilient construction and demonstrates emergency evacuation procedures during flood events. ▪ Adjacent existing open spaces and water compatible uses in Flood Zones A and B should be retained to maintain flood storage areas. ▪ FRAs and project level mitigation should also address surface water management for the development of the preferred routes, demonstrating consideration of CDP 2018-2024 policies, Technical Document RE-CPI-07001 a Drainage Design for National Road Schemes - Sustainable Drainage Options, incorporation of SuDS into the design and the potential transfer of surface water runoff between subcatchments. ▪ Ancillary development associated with the strategic road corridors in the flood zoned area can generally be considered appropriate, but an appropriately detailed flood risk assessment will be required in support of the development consent process. The level of detail will vary depending on the risks identified and the proposed land use. The FRA should be aimed at setting road levels and demonstrating no increase in flood risk elsewhere. <p>The County Donegal Development Plan 2018-2024 already incorporates policy requirements to consider such measures outlined above, as summarised in Table 7.1 of this SFRA.</p>

Justification Test for Northern and Western Relief Roads

	Criteria	Response
1.	The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act 2000, as amended.	Letterkenny is targeted for growth under the National Planning Framework, the Regional Spatial and Economic Strategy for the Northern and Western Regional Assembly Area 2020-2032 and the County Donegal Development Plan 2018-2024. In particular, Letterkenny is identified as a Regional Centre in the National Planning Framework and the Regional Spatial and Economic Strategy. Such centres are identified in the NPF to lead the development of their regions.
2.	The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular:	
2(i)	Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement:	The development of both the northern and western relief roads is seen as a crucial component in easing traffic congestion within Letterkenny town centre and thereby 'creating space' for the development of alternative, sustainable modes of travel through the centre. Thus, the development of said roads is essential for the regeneration and future sustainable development of Letterkenny.
2(ii)	Comprises significant previously developed and/or under-utilised lands:	The corridors for the northern and western relief roads skirt the edges of the urban area, passing significant areas of existing development at Windyhall and Glencar (northern relief road) and more under-utilised lands at Kirkstown (western relief road). The development of the road corridors is deemed to constitute an efficient use of otherwise under-utilised land in these respective areas in order to facilitate the sustainable development of Letterkenny going forward.
2(iii)	Is within or adjoining the core of an established or designated urban settlement:	The road corridors pass significant areas of existing development to the south and east and are intended to function as relief roads to ease congestion within the urban core.
2(iv)	Will be essential in achieving compact and sustainable urban growth;	The northern and western relief roads comprise a critical part of the suite of traffic management solutions for Letterkenny going forward and thus will be essential in the achievement of compact and sustainable urban growth.
2(v)	There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.	The road corridors have been identified to enable traffic to bypass more centrally located lands that suffer from traffic congestion. There are no suitable alternative lands for the intended purpose.
3.	The strategic road infrastructure at Kirkstown (Western Relief Road) and Glencar (Northern Relief Road) cross a limited extent of flood risk areas. In these instances the extent of the lands within Flood Zones A or B is insignificant in the context of the wider overall lands zoned at the location. Due to relatively small watercourses and floodplains there is a high likelihood that this will not increase the risk of flooding elsewhere provided adequate mitigation measures including the consideration of suitable bridge spans can be proposed as part of a site-specific FRA. Therefore flood risk to the strategic road corridors can be adequately managed and the use or development of the lands will not cause unacceptable adverse impacts elsewhere.	

Criteria	Response
	<p data-bbox="284 277 1423 338">It is recommended that the following measures be implemented to ensure that the strategic road does not give rise to unacceptable adverse impacts elsewhere:</p> <ul style="list-style-type: none"> <li data-bbox="295 353 1423 450">▪ The infilling of floodplains for construction of any kind should be avoided where possible. Where this is not possible and the other criteria for the justification test is met, the mitigation for the strategic roads will include <ul style="list-style-type: none"> <li data-bbox="352 479 1423 575">- Spanning the flood plains is a possible option so long as adequate freeboard is provided and it can be proven that any supports required in the flood plain have a negligible effect on the displacement of flood waters. <li data-bbox="352 604 1423 665">- Flood relief culverts through road embankments may also be an option to allow flood waters to reach their natural flood extents. <li data-bbox="295 703 1423 799">▪ A detailed hydraulic model for the associated river channel and floodplains should be carried out at development management stage to assess this impact and appropriate mitigation measure should be implemented. <li data-bbox="295 828 1423 925">▪ The detailed FRAs for the preferred option should demonstrate that road level is designed for the 0.1% AEP level plus suitable freeboard. The recommended level of freeboard is 500 mm for fluvial flood levels. <li data-bbox="295 954 1423 1111">▪ The detailed FRAs should also examine residual risk associated with culvert blockages, defence failure and climate change to set final road levels where appropriate. The FRAs should ensure development of the strategic roads do not block flow paths, does not increase flood risk elsewhere, is designed to appropriate standard of flood resilient construction and demonstrates emergency evacuation procedures during flood events. <li data-bbox="295 1140 1423 1200">▪ Adjacent existing open spaces and water compatible uses in Flood Zones A and B should be retained to maintain flood storage areas. <li data-bbox="295 1229 1423 1386">▪ FRAs and project level mitigation should also address surface water management for the development of the preferred routes, demonstrating consideration of CDP 2018-2024 policies, Technical Document RE-CPI-07001 a Drainage Design for National Road Schemes - Sustainable Drainage Options, incorporation of SuDS into the design and the potential transfer of surface water runoff between subcatchments. <li data-bbox="295 1415 1423 1572">▪ Ancillary development associated with the strategic road corridors in the flood zoned area can generally be considered appropriate, but an appropriately detailed flood risk assessment will be required in support of the development consent process. The level of detail will vary depending on the risks identified and the proposed land use. The FRA should be aimed at setting road levels and demonstrating no increase in flood risk elsewhere. <p data-bbox="284 1610 1423 1671">The County Donegal Development Plan 2018-2024 already incorporates policy requirements to consider such measures outlined above, as summarised in Table 7.1 of this SFRA</p> <p data-bbox="284 1686 1423 1774">N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant detailed flood risk assessment.</p>

Justification Test for Southern Network Project

	Criteria	Response
1.	The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act 2000, as amended.	Letterkenny is targeted for growth under the National Planning Framework, the Regional Spatial and Economic Strategy for the Northern and Western Regional Assembly Area 2020-2032 and the County Donegal Development Plan 2018-2024. In particular, Letterkenny is identified as a Regional Centre in the National Planning Framework and the Regional Spatial and Economic Strategy. Such centres are identified in the NPF to lead the development of their regions.
2.	The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular:	
2(i)	Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement:	The Southern Network Project (SNP) is an essential component of the suite of traffic management solutions for Letterkenny. The SNP will complement the proposed TEN-T project and contribute significantly towards the alleviation of traffic congestion in Letterkenny town centre, thus freeing up vital space for the provision of more sustainable modes of transport. The SNP will also, in tandem with a new bridge crossing over the River Swilly, enable a new means of accessing and egressing the town centre from the south, thereby creating opportunities for the development of new neighbourhoods on the southern side of the river. Thus, the SNP is essential to facilitate both the regeneration and expansion of the urban core.
2(ii)	Comprises significant previously developed and/or under-utilised lands:	The SNP road corridor passes through currently under-utilised lands that are in close proximity to the town centre of Letterkenny.
2(iii)	Is within or adjoining the core of an established or designated urban settlement:	The SNP road project will serve lands that are adjacent to the urban core.
2(iv)	Will be essential in achieving compact and sustainable urban growth;	The SNP is a critical part of the suite of traffic management solutions for Letterkenny going forward and will be essential for the achievement of compact and sustainable urban growth.
2(v)	There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.	The SNP will enable traffic to bypass more centrally located lands that suffer from traffic congestion, linking the national road network on the eastern side of the town with regional and local roads to the west. The SNP will also contribute to the creation of a new means of access to the town centre from the south of Letterkenny. There are no suitable alternative lands for the intended purpose.
3.	Given the objective of this project and in particular the need for a number of crossings of the River Swilly it is not possible to avoid crossing areas at flood risk. A detailed flood risk assessment has already been completed for large parts of the new road construction where the outline design has been completed. Figure 1 shows the extent of the Southern Network Project where a detailed flood risk assessment has already been completed. A new 1D/2D hydraulic model has been developed using Innovyze Integrated Catchment Management (ICM) software of the Lismonaghan watercourse. The new relief road model was used to assess the impact of potential flooding to properties and infrastructure. Following this,	

Criteria

Response

the results were used to determine whether mitigation measures would be required to offset potential increases in this flood risk.

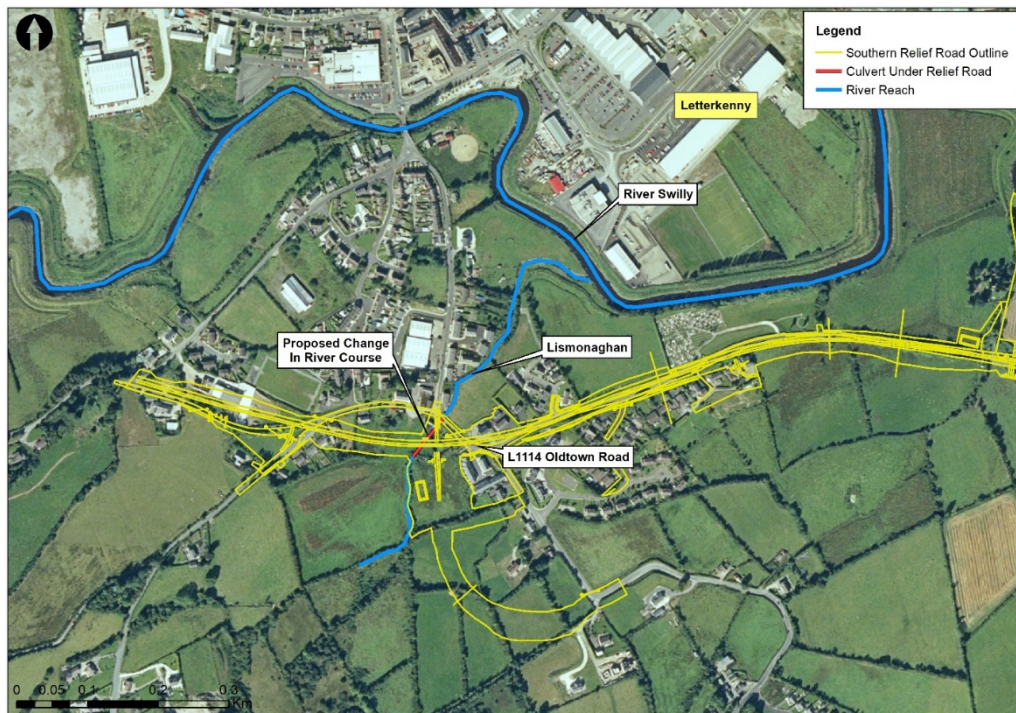


Figure 1: Location of Southern Network Project subject to detailed development management flood risk assessment

Hydraulic modelling indicated that flood extents remain unchanged and water levels increases are negligible. No additional receptors are expected to become at risk due to the construction of the relief road and culvert so no mitigation measures are considered necessary along this section.

The Southern Network Project also requires a number of crossings of the River Swilly and its floodplain. This means the corridor will cross areas at flood risk. Mitigation to offset any potential to increase flood risk from the River Swilly Crossings is possible including spanning the flood plains, so long as adequate freeboard is provided and it can be proven that any supports required in the flood plain have a negligible effect on the displacement of flood waters. Flood relief culverts through road embankments may also be an option to allow flood waters to reach their natural flood extents. The detailed development management FRA completed for the elements of this project that have had outline design completed and the mitigation measures necessary to ensure the project will not adversely impact on flood risk for the River Swilly crossings means that the project passes the development plan justification test.

It is recommended that the following measures be implemented to ensure that the strategic road does not give rise to unacceptable adverse impacts elsewhere:

- The infilling of floodplains for construction of any kind should be avoided where possible. Where this is not possible and the other criteria for the justification test is met, the mitigation for the strategic roads will include
 - Spanning the flood plains is a possible option so long as adequate freeboard is provided and it can be proven that any supports required in the flood plain have a negligible effect on the displacement of flood waters.
 - Flood relief culverts through road embankments may also be an option to allow flood
-

Criteria	Response
	<p>waters to reach their natural flood extents.</p> <ul style="list-style-type: none"> ▪ A detailed hydraulic model for the associated river channel and floodplains should be carried out at development management stage for the sections of the project not already subjected to detailed FRA to assess this impact and appropriate mitigation measure should be implemented. ▪ The detailed FRAs for the preferred option should demonstrate that road level is designed for the 0.1% AEP level plus suitable freeboard. The recommended level of freeboard is 500 mm for fluvial flood levels. ▪ The detailed FRAs should also examine residual risk associated with culvert blockages, defence failure and climate change to set final road levels where appropriate. The FRAs should ensure development of the strategic roads do not block flow paths, does not increase flood risk elsewhere, is designed to appropriate standard of flood resilient construction and demonstrates emergency evacuation procedures during flood events. ▪ Adjacent existing open spaces and water compatible uses in Flood Zones A and B should be retained to maintain flood storage areas. ▪ FRAs and project level mitigation should also address surface water management for the development of the preferred routes, demonstrating consideration of CDP 2018-2024 policies, Technical Document RE-CPI-07001 a Drainage Design for National Road Schemes - Sustainable Drainage Options, incorporation of SuDS into the design and the potential transfer of surface water runoff between subcatchments. ▪ Ancillary development associated with the strategic road corridors in the flood zoned area can generally be considered appropriate but an appropriately detailed flood risk assessment will be required in support of the development consent process. The level of detail will vary depending on the risks identified and the proposed land use. The FRA should be aimed at setting road levels and demonstrating no increase in flood risk elsewhere. <p>The County Donegal Development Plan 2018-2024 already incorporates policy requirements to consider such measures outlined above, as summarised in Table 7.1 of this SFRA</p> <p>N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant detailed flood risk assessment.</p>

Justification Test for Strategic Road Corridors at Drumnahoagh and Bonagee

	Criteria	Response
1.	The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act 2000, as amended.	Letterkenny is targeted for growth under the National Planning Framework, the Regional Spatial and Economic Strategy for the Northern and Western Regional Assembly Area 2020-2032 and the County Donegal Development Plan 2018-2024. In particular, Letterkenny is identified as a Regional Centre in the National Planning Framework and the Regional Spatial and Economic Strategy. Such centres are identified in the NPF to lead the development of their regions.
2.	The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular:	
2(i)	Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement:	The strategic road corridors at Drumnahoagh and Bonagee are essential components of the suite of traffic management solutions for Letterkenny, designed to cater for the free flow of traffic as the town expands, to free up town centre space for alternative, sustainable modes of transport and to potentially activate new tracts of lands adjacent to the urban core. The corridors are thus essential for the regeneration and expansion of the settlement.
2(ii)	Comprises significant previously developed and/or under-utilised lands:	The road corridors pass through under-utilised lands in close proximity to the urban core of Letterkenny.
2(iii)	Is within or adjoining the core of an established or designated urban settlement:	The road corridors are located in close proximity to the urban core of Letterkenny.
2(iv)	Will be essential in achieving compact and sustainable urban growth;	The strategic road corridors at Drumnahoagh and Bonagee comprise critical parts of the suite of traffic management solutions for Letterkenny going forward and thus will be essential in terms of achieving compact and sustainable urban growth.
2(v)	There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.	The road corridors have been identified to enable the development of links between the Leck Road area and the Port Road/National Route N13. The corridors are essential elements of the bigger picture regarding traffic movements in Letterkenny as the Regional Centre expands. The corridors may also allow for the activation of additional employment lands at Drumnahoagh/Bonagee. There are no suitable alternative lands for the intended purpose.
3.	A flood risk assessment to an appropriate level of detail has been carried out as part of the SFRA for Letterkenny Local Area Plan, which demonstrates that flood risk to the strategic road corridors can be adequately managed and the use or development of the lands will not cause unacceptable adverse impacts elsewhere. N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant detailed flood risk assessment.	
		Construction of these sections of the strategic road corridors could pose significant flooding risk to the adjacent lands and properties, both during the construction and post construction stages of the works. However, it is recommended that the following measures be implemented to ensure

Criteria	Response
	<p>that the strategic road does not give rise to unacceptable adverse flood risk impacts elsewhere:</p> <ul style="list-style-type: none"> ▪ The infilling of floodplains for construction of any kind should be avoided where possible. Where this is not possible and the other criteria for the justification test is met, the mitigation for the strategic roads will include <ul style="list-style-type: none"> - Spanning the flood plains is a possible option so long as adequate freeboard is provided and it can be proven that any supports required in the flood plain have a negligible effect on the displacement of flood waters. - Flood relief culverts through road embankments may also be an option to allow flood waters to reach their natural flood extents. ▪ A detailed hydraulic model for the associated river channel and floodplains should be carried out at development management stage to assess this impact and appropriate mitigation measure should be implemented. ▪ The detailed FRAs for the preferred option should demonstrate that road level is designed for the 0.1% AEP level plus suitable freeboard. The recommended level of freeboard is 500 mm for fluvial flood levels. ▪ The detailed FRAs should also examine residual risk associated with culvert blockages, defence failure and climate change to set final road levels where appropriate. The FRAs should ensure development of the strategic roads do not block flow paths, does not increase flood risk elsewhere, is designed to appropriate standard of flood resilient construction and demonstrates emergency evacuation procedures during flood events. ▪ Adjacent existing open spaces and water compatible uses in Flood Zones A and B should be retained to maintain flood storage areas. ▪ FRAs and project level mitigation should also address surface water management for the development of the preferred routes, demonstrating consideration of CDP 2018-2024 policies, Technical Document RE-CPI-07001 a Drainage Design for National Road Schemes - Sustainable Drainage Options, incorporation of SuDS into the design and the potential transfer of surface water runoff between subcatchments. ▪ Ancillary development associated with the strategic road corridors in the flood zoned area can generally be considered appropriate, but an appropriately detailed flood risk assessment will be required in support of the development consent process. The level of detail will vary depending on the risks identified and the proposed land use. The FRA should be aimed at setting road levels and demonstrating no increase in flood risk elsewhere. <p>The County Donegal Development Plan 2018-2024 already incorporates policy requirements to consider such measures outlined above, as summarised in Table 7.1 of this SFRA.</p>

Justification Test for Opportunity Site 3

	Criteria	Response
1.	The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act 2000, as amended.	Letterkenny is targeted for growth under the National Planning Framework, the Regional Spatial and Economic Strategy for the Northern and Western Regional Assembly Area 2020-2032 and the County Donegal Development Plan 2018-2024. In particular, Letterkenny is identified as a Regional Centre in the National Planning Framework and the Regional Spatial and Economic Strategy. Such centres are identified in the NPF to lead the development of their regions.
2.	The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular:	
2(i)	Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement:	Opportunity Site 3 is a brownfield site that was formerly occupied by the Unifi textiles plant. The subject lands, a large portion of which now lie vacant, adjoin the largest employment area in the town of Letterkenny and occupy a strategic location adjacent to National Secondary Route N56. The lands are deemed essential for regeneration purposes, to enable the consolidation of this employment area and thus contribute towards the economic success of the Regional Centre.
2(ii)	Comprises significant previously developed and/or under-utilised lands:	Opportunity Site 3 is a brownfield site that was formerly occupied by the Unifi textiles plant.
2(iii)	Is within or adjoining the core of an established or designated urban settlement:	The subject lands are located circa 900m from the defined town centre boundary (approximately 10 mins walking time) in an area of long-established commercial development and immediately adjacent to a new primary school.
2(iv)	Will be essential in achieving compact and sustainable urban growth;	The redevelopment of this significant brownfield site, located in close proximity to the town centre, would contribute towards the compact and sustainable growth of Letterkenny going forward; in effect allowing for the densification of an existing employment area, in turn potentially facilitating economies of agglomeration and enabling efficient and cost effective future public transport solutions.
2(v)	There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.	The brownfield redevelopment opportunity offered by Opportunity Site 3 is not replicated at any other location within the proposed Letterkenny plan boundary. The proximity of the site to existing employment uses within the IDA Business Park and indeed to local services such as schools and neighbourhood shops, renders Opportunity Site 3 an ideal site for redevelopment, subject to the findings of a suitably detailed flood risk assessment (inclusive of flood modelling).
3.	A flood risk assessment to an appropriate level of detail has been carried out as part of the SFRA. Using the existing MIKE hydraulic model, developed during CFRAM, RPS have carried out a flood risk assessment to determine the implications of the development of areas of the site that are currently at risk of flooding. This analysis has been undertaken with the aims of maintaining the functional flood plain and flooding mechanisms that currently existing on the site and then assessing the impact of developing the periphery of the floodplain and ensuring there is no increase in risk in flood risk to adjacent sites. This has been simulated by blocking out areas of	

Criteria**Response**

the floodplain (shown in Figure 1) within the hydraulic model as a representation of the impact of developing the site. The model has then been re-run and flood extents compared to the existing.

For the areas outlined in green in Figure 1, the model results indicate that development can take place without increasing the risk of flooding elsewhere. In addition, there is a 5m buffer on either side of the watercourse to facilitate access and maintenance and some preservation of existing flood mechanisms. This flood risk assessment has demonstrated that flood risk to the development can be adequately managed and the use or development of the lands at opportunity site 3, within the boundary illustrated in Figure 1 below, will not cause unacceptable adverse impacts elsewhere.

A detailed site-specific flood risk assessment will still be required at Planning Application Stage, in full compliance with The Planning System and Flood Risk Management Guidelines and with application of the Justification Test for Development Management as appropriately guided by the Sequential Approach.

N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant detailed flood risk assessment.

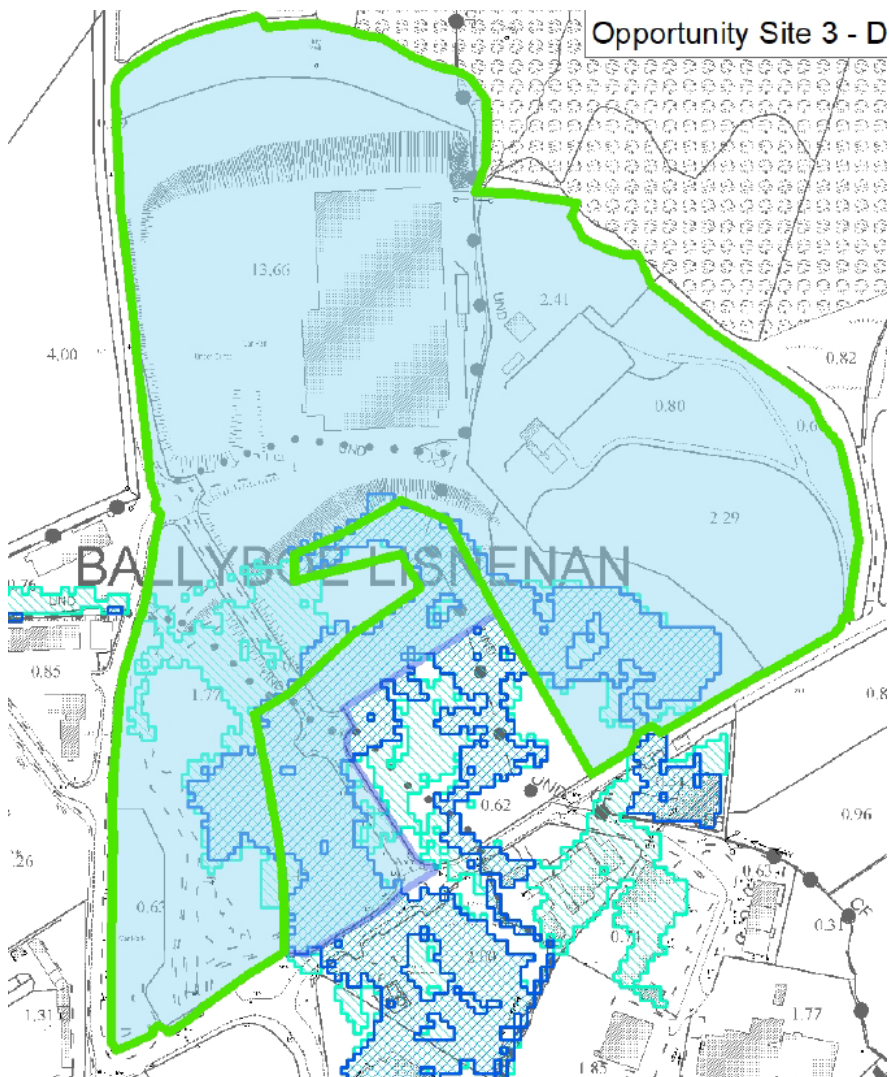


Figure 1 – Development extents of opportunity Site 3 after flood risk assessment

Justification Test for Opportunity Site 7 High Road/De Valera Road

	Criteria	Response
1.	The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act 2000, as amended.	Letterkenny is targeted for growth under the National Planning Framework, the Regional Spatial and Economic Strategy for the Northern and Western Regional Assembly Area 2020-2032 and the County Donegal Development Plan 2018-2024. In particular, Letterkenny is identified as a Regional Centre in the National Planning Framework and the Regional Spatial and Economic Strategy. Such centres are identified in the NPF to lead the development of their regions.
2.	The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular:	
2(i)	Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement:	Opportunity Site 7 is located in a prime position circa 20m from the defined town centre boundary and 150m south of the Letterkenny University Hospital campus. The development of the subject lands would constitute a logical extension of urban form of Letterkenny, effectively constituting infill development adjacent the urban core.
2(ii)	Comprises significant previously developed and/or under-utilised lands:	Opportunity Site 7 comprises a significant parcel of under-utilised lands adjacent to the town centre and within easy reach of critical services.
2(iii)	Is within or adjoining the core of an established or designated urban settlement:	The subject lands are located circa 20m from the defined town centre boundary.
2(iv)	Will be essential in achieving compact and sustainable urban growth;	The development of this site, located in close proximity to the town centre, is deemed essential in terms of delivering compact growth in Letterkenny, potentially offering opportunities for mixed use development in a central location proximate to numerous amenities and services such as the Town Park, Hospital and neighbourhood shops.
2(v)	There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.	The Planning Authority is of the opinion that there are no suitable alternative sites offering the same locational benefits as Opportunity Site 7 and therefore that the development of this site would be justified, subject to the findings of a detailed flood risk assessment (inclusive of flood modelling).
3.	<p>A flood risk assessment to an appropriate level of detail has been carried out as part of the SFRA.</p> <p>A new InfoWorks ICM model has been created covering Opportunity Site 7, 11 and the Town Centre Zoning. This facilitates the assessment of the implications of development of these sites in combination and any potential increase in flood risk elsewhere.</p> <p>Opportunity Site 7 High Road/De Valera Road</p> <p>Using the Infoworks hydraulic model, developed as part of this SFRA, RPS have carried out a flood risk assessment to determine the implications of the development of areas of the site that are currently at risk of flooding. This analysis has been undertaken with the aims of maintaining the functional flood plain and flooding mechanisms that currently existing on the site and then assessing the impact of developing the periphery of the floodplain and ensuring there is no</p>	

Criteria**Response**

increase in risk in flood risk to adjacent sites. This has been simulated by blocking out areas of the floodplain (shown in Figure 1) within the hydraulic model as a representation of the impact of developing the site. The model has then been re-run and flood extents compared to the existing.

Flooding on this site is limited to shallow depth sheet flow. For the areas outlined in green in Figure 1, the model results indicate that development can take place without increasing the risk of flooding elsewhere. In addition, there is a 5m buffer on either side of the watercourse to facilitate access and maintenance and some preservation of existing flood mechanisms. This flood risk assessment has demonstrated that flood risk to the development can be adequately managed and the use or development of the lands at opportunity site 7, within the boundary illustrated in Figure 1 below, will not cause unacceptable adverse impacts elsewhere, particularly in Opportunity Site 11 or the Town Centre.

A detailed site-specific flood risk assessment will still be required at Planning Application Stage, in full compliance with The Planning System and Flood Risk Management Guidelines and with application of the Justification Test for Development Management as appropriately guided by the Sequential Approach.

N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant detailed flood risk assessment.

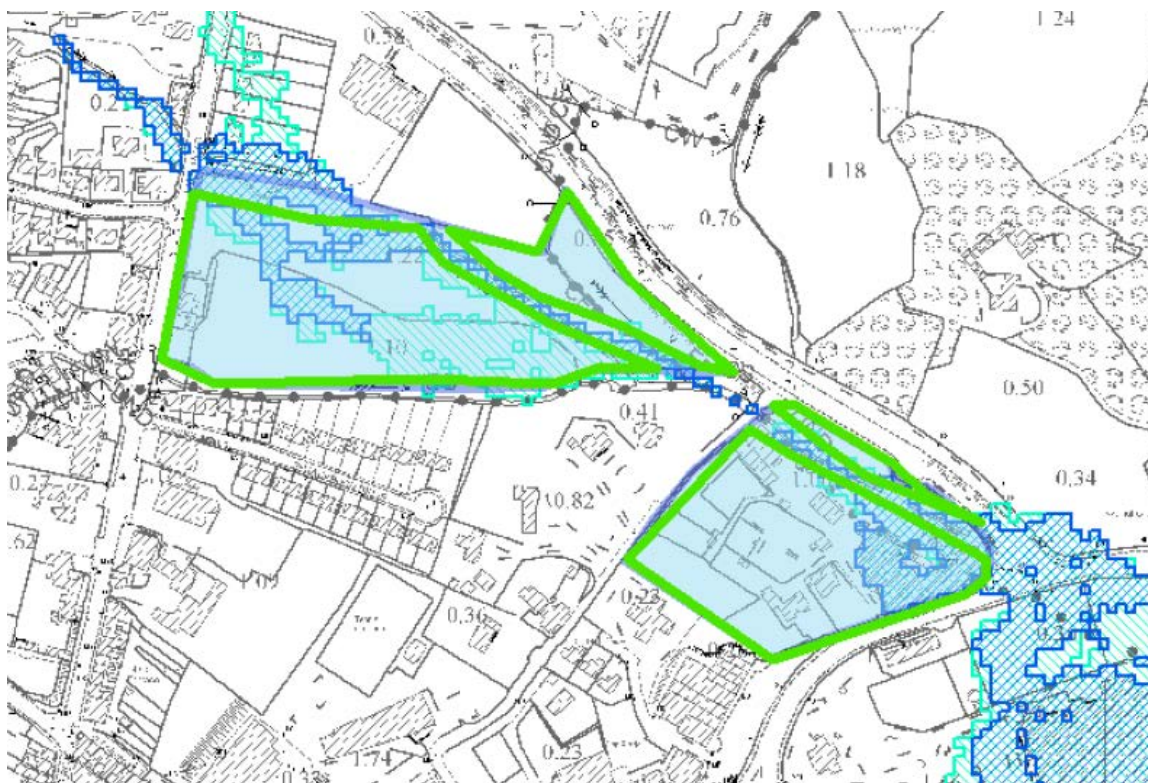


Figure 1 – Development extents of opportunity Site 7 and 11 after flood risk assessment

Justification Test for Opportunity Site 11 Old Oatfield Site

	Criteria	Response
1.	The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act 2000, as amended.	Letterkenny is targeted for growth under the National Planning Framework, the Regional Spatial and Economic Strategy for the Northern and Western Regional Assembly Area 2020-2032 and the County Donegal Development Plan 2018-2024. In particular, Letterkenny is identified as a Regional Centre in the National Planning Framework and the Regional Spatial and Economic Strategy. Such centres are identified in the NPF to lead the development of their regions.
2.	The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular:	
2(i)	Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement:	Opportunity Site 11 a brownfield site that was formerly occupied by the Oatfield confectionery factory. The subject lands, which now lie vacant, occupy a strategic corner site adjoining the town centre and are deemed essential to facilitate regeneration.
2(ii)	Comprises significant previously developed and/or under-utilised lands:	Opportunity Site 11 is a brownfield site that was formerly occupied by the Oatfield confectionery factory.
2(iii)	Is within or adjoining the core of an established or designated urban settlement:	The subject lands adjoin the town centre of Letterkenny.
2(iv)	Will be essential in achieving compact and sustainable urban growth;	The redevelopment of this prime brownfield site is deemed essential for the future compact growth and regeneration of Letterkenny.
2(v)	There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.	The brownfield redevelopment opportunity offered by Opportunity Site 11 is not replicated at any other location within the proposed Letterkenny plan boundary. The lands are immediately adjacent the town centre, within walking distance of a range of amenities and services. As such, the redevelopment of this site is deemed to be justified, subject to the findings of a detailed flood risk assessment (inclusive of flood modelling).
3.	<p>A flood risk assessment to an appropriate level of detail has been carried out as part of the SFRA.</p> <p>A new InfoWorks ICM model has been created covering Opportunity Site 7, 11 and the Town Centre Zoning. This facilitates the assessment of the implications of development of these sites in combination and any potential increase in flood risk elsewhere.</p> <p>Opportunity Site 11 Old Oatfield Site</p> <p>Using the Infoworks hydraulic model, developed as part of this SFRA, RPS have carried out a flood risk assessment to determine the implications of the development of areas of the site that are currently at risk of flooding. This analysis has been undertaken with the aims of maintaining the functional flood plain and flooding mechanisms that currently existing on the site and then assessing the impact of developing the periphery of the floodplain and ensuring there is no increase in risk in flood risk to adjacent sites. This has been simulated by blocking out areas of the floodplain (shown in Figure 1) within the hydraulic model as a representation of the impact of</p>	

Criteria

Response

developing the site. The model has then been re-run and flood extents compared to the existing.

Flooding on this site is limited to shallow depth sheet flow. For the areas outlined in green in Figure 1, the model results indicate that development can take place without increasing the risk of flooding elsewhere. In addition, there is a 5m buffer on either side of the watercourse to facilitate access and maintenance and some preservation of existing flood mechanisms. This flood risk assessment has demonstrated that flood risk to the development can be adequately managed and the use or development of the lands at opportunity site 11, within the boundary illustrated in Figure 1 below, will not cause unacceptable adverse impacts elsewhere, particularly in the Town Centre.

A detailed site-specific flood risk assessment will still be required at Planning Application Stage, in full compliance with The Planning System and Flood Risk Management Guidelines and with application of the Justification Test for Development Management as appropriately guided by the Sequential Approach.

N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant detailed flood risk assessment.

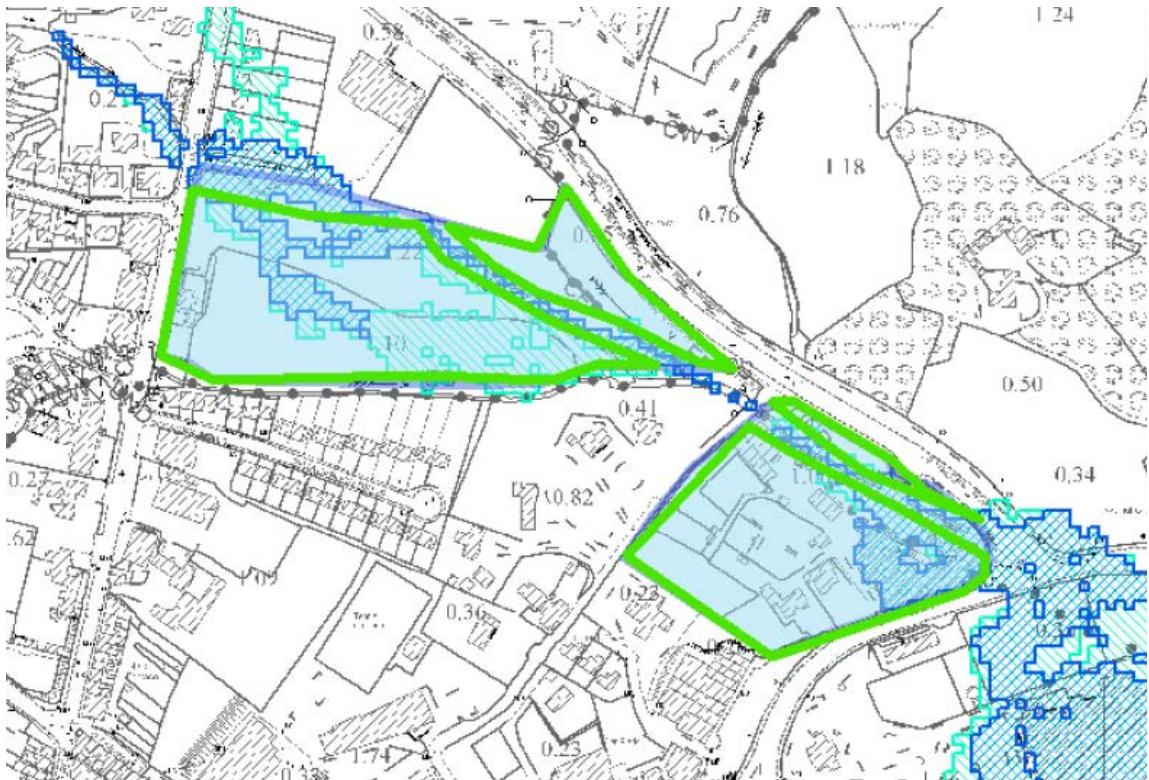


Figure 1 – Development extents of opportunity Site 7 and 11 after flood risk assessment

Justification Test for ATU Site

	Criteria	Response
1.	The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act 2000, as amended.	Letterkenny is targeted for growth under the National Planning Framework, the Regional Spatial and Economic Strategy for the Northern and Western Regional Assembly Area 2020-2032 and the County Donegal Development Plan 2018-2024. In particular, Letterkenny is identified as a Regional Centre in the National Planning Framework and the Regional Spatial and Economic Strategy. Such centres are identified in the NPF to lead the development of their regions.
2.	The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular:	
2(i)	Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement:	The ATU lands south of the Port Road are essential to facilitate the future expansion of the University, which is a regionally important facility and crucial for the economic development of Letterkenny and indeed the County.
2(ii)	Comprises significant previously developed and/or under-utilised lands:	This parcel of land has been partially developed by ATU for use as a car park, whilst planning permission is in place for the development of a solar array on another area of the lands. The remainder of the land parcel constitutes a significant area of under-utilised land in the town centre of Letterkenny.
2(iii)	Is within or adjoining the core of an established or designated urban settlement:	The lands are within the urban core of Letterkenny.
2(iv)	Will be essential in achieving compact and sustainable urban growth;	The subject lands will be essential in achieving compact growth, being the only logical area that can facilitate the future expansion of the University campus in the town centre.
2(v)	There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.	There are no suitable alternative lands available to enable the expansion of the ATU campus in the town centre.
3.	<p>A flood risk assessment to an appropriate level of detail has been carried out as part of the SFRA.</p> <p>A new InfoWorks ICM model has been created covering Opportunity Site 7, 11 and the Town Centre Zoning. This facilitates the assessment of the implications of development of these sites in combination and any potential increase in flood risk elsewhere.</p> <p>ATU Site</p> <p>Using the Infoworks hydraulic model, developed as part of this SFRA, RPS have carried out a flood risk assessment to determine the implications of the development of areas of the site that are currently at risk of flooding. This analysis has been undertaken with the aims of maintaining the functional flood plain and flooding mechanisms that currently existing on the site and then assessing the impact of developing the periphery of the floodplain and ensuring there is no increase in risk in flood risk to adjacent sites. This has been simulated by blocking out areas of</p>	

Criteria**Response**

the floodplain (shown in Figure 1) within the hydraulic model as a representation of the impact of developing the site. The model has then been re-run and flood extents compared to the existing.

Flooding on this site is limited to shallow depth sheet flow. For the areas outlined in red in Figure 1, the model results indicate that development can take place without increasing the risk of flooding elsewhere. This flood risk assessment has demonstrated that flood risk to the development can be adequately managed and the use or development of the lands at the ATU site, within the boundary illustrated in Figure 1 below, will not cause unacceptable adverse impacts elsewhere, particularly in the Town Centre.

On further investigation of the flooding mechanisms of this part of the site it is apparent that this site has been raised in the past and flood waters from the Isle Burn flow across the flood plain flanking around the southern portion of this site and then continue into the lower lying areas to the east of the site. Once the flood waters flow into this lower lying area they then have a flood route back into the ATU site along the Port Road. The flood extents within this part of the site are at the extreme of the flood plain and flood depths are not significant, and this means that the development of this part of the site along the Port Road Frontage does not result in the displacement of significant volumes of water. Therefore, the impact downstream is not significant.

For the areas outside of the red boundary in Figure 1 the land use zoning in the areas within flood zone B should be less vulnerable development and those in flood zone A should be water compatible in accordance with the guidelines.

A detailed site-specific flood risk assessment will still be required at Planning Application Stage, in full compliance with The Planning System and Flood Risk Management Guidelines and with application of the Justification Test for Development Management as appropriately guided by the Sequential Approach.

N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant detailed flood risk assessment.

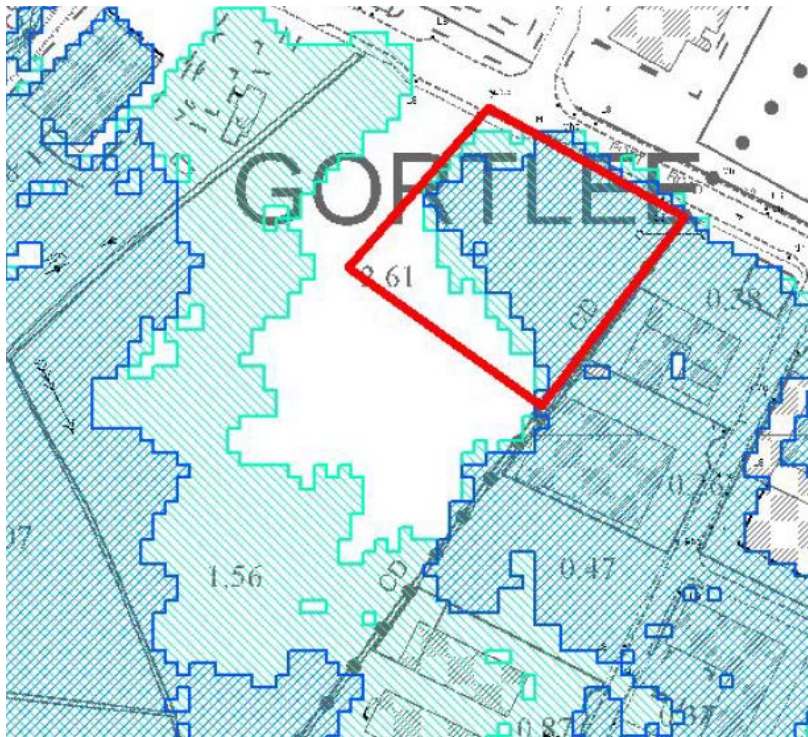


Figure 1 – ATU site with area in red raised to simulate development as assessed by hydraulic modelling

Justification Test for General Employment Lands at Kiltroy

	Criteria	Response
1.	The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act 2000, as amended.	Letterkenny is targeted for growth under the National Planning Framework, the Regional Spatial and Economic Strategy for the Northern and Western Regional Assembly Area 2020-2032 and the County Donegal Development Plan 2018-2024. In particular, Letterkenny is identified as a Regional Centre in the National Planning Framework and the Regional Spatial and Economic Strategy. Such centres are identified in the NPF to lead the development of their regions.
2.	The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular:	
2(i)	Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement:	The subject lands are located in close proximity to the largest employment area in the town of Letterkenny and occupy a strategic location adjacent to National Secondary Route N56. The lands are deemed essential for regeneration purposes, to enable the consolidation of this employment area and thus contribute towards the economic success of the Regional Centre.
2(ii)	Comprises significant previously developed and/or under-utilised lands:	The subject lands comprise under-utilised lands in close proximity to an existing employment areas and the town centre.
2(iii)	Is within or adjoining the core of an established or designated urban settlement:	The subject lands are located circa 900m from the defined town centre boundary (approximately 10 mins walking time) in an area of long-established commercial development and immediately adjacent to a new primary school.
2(iv)	Will be essential in achieving compact and sustainable urban growth;	The development of this site, located in close proximity to the town centre, would contribute towards the compact and sustainable growth of Letterkenny going forward; allowing for the expansion of an existing employment area and in turn potentially facilitating economies of agglomeration and enabling efficient and cost effective future public transport solutions.
2(v)	There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.	The development opportunity offered by this site is not replicated at any other location within the proposed Letterkenny plan boundary. The proximity of the site to existing employment uses within the IDA Business Park and indeed to local services such as schools and neighbourhood shops, renders this an ideal site for development, subject to the findings of a suitably detailed flood risk assessment.
3.	A flood risk assessment to an appropriate level of detail has been carried out as part of the SFRA. Using the existing MIKE hydraulic model, developed during CFRAM, RPS have carried out a flood risk assessment to determine the implications of the development of areas of the site that are currently at risk of flooding. This analysis has been undertaken with the aims of maintaining the functional flood plain and flooding mechanisms that currently exist on the site and then assessing the impact of developing the periphery of the floodplain and ensuring there is no increase in risk in flood risk to adjacent sites. This has been simulated by blocking out areas of the floodplain (shown in Figure 1) within the hydraulic model as a representation of the impact of developing the site. The model has then been re-run and flood extents compared to the existing. For the areas outlined in green in Figure 1, the model results indicate that development can take	

Criteria**Response**

place without increasing the risk of flooding elsewhere. In addition, there is a 5m buffer on either side of the watercourse to facilitate access and maintenance and some preservation of existing flood mechanisms. This flood risk assessment has demonstrated that flood risk to the development can be adequately managed and the use or development of the lands at the General Employment lands at Kilttoy, within the boundary illustrated in Figure 1 below, will not cause unacceptable adverse impacts elsewhere.

A detailed site-specific flood risk assessment will still be required at Planning Application Stage, in full compliance with The Planning System and Flood Risk Management Guidelines and with application of the Justification Test for Development Management as appropriately guided by the Sequential Approach.

N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant detailed flood risk assessment.

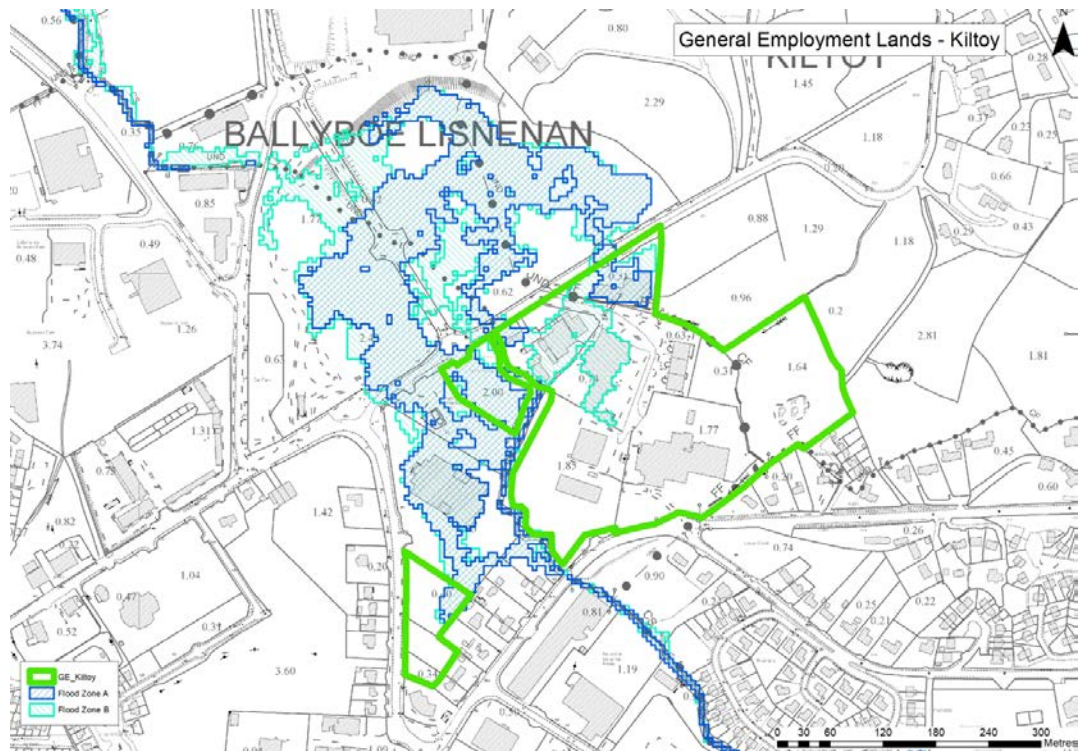


Figure 1 – Development extents of General Employment Lands at Kilttoy after flood risk assessment
