



Flood Risk Assessment

Appendix 1 to Strategic Environmental
Assessment Screening of Amendment No. 1
to Ferrybank/Belview Local Area Plan



1 Introduction

As part of the Strategic Environmental Assessment Screening for Proposed Amendment No. 1 to the Ferrybank/Belview Local Area Plan, in line with *The Planning System and Flood Risk Management – Guidelines for Planning Authorities*, a staged approach has been taken to the appraisal and assessment of flood risk.

1.1 Disclaimer

It is important to note that compliance with the requirements of *The Planning System and Flood Risk Management - Guidelines for Planning Authorities*, and of the Floods Directive 2007 60/EC is a work in progress and is currently based on emerging and incomplete data as well as estimates of the locations and likelihood of flooding. In particular, the assessment and mapping of areas of flood risk awaits the publication both of Preliminary Flood Risk Assessments [PFRAs] and Catchment-based Flood Risk Assessment and Management Plans [CFRAMs]. As a result, this Flood Risk Assessment is based on available information.

Accordingly, all information in relation to flood risk is provided for general policy guidance only. It may be substantially altered in light of future data and analysis. As a result, all landowners and developers are advised that Kilkenny County Council and its agents can accept no responsibility for losses or damages arising due to assessments of the vulnerability to flooding of lands, uses and developments. Owners, users and developers are advised to take all reasonable measures to assess the vulnerability to flooding of lands in which they have an interest prior to making planning or development decisions.

1.2 Structure of a Flood Risk Assessment (FRA)

The Guidelines recommend that a staged approach is adopted when undertaking a Flood Risk Assessment (FRA). The recommended stages are briefly described below:

- Stage 1 ~ Flood Risk Identification

To identify whether there may be any flooding or surface water management issues that will require further investigation. This stage mainly comprises a comprehensive desk study of available information to establish whether a flood risk issue exists or whether one may exist in the future.

- Stage 2 ~ Initial Flood Risk Assessment

If a flood risk issue is deemed to exist arising from the Stage 1 Flood Risk Identification process, the assessment proceeds to Stage 2 which confirms the sources of flooding, appraises the adequacy of existing information and determines the extent of additional surveys and the degree of modelling that will be required. Stage 2 must be sufficiently detailed to allow the application of the sequential approach (as described in Section 1.5) within the flood risk zone.

- Stage 3 ~ Detailed Flood Risk Assessment

Where Stages 1 and 2 indicate that a proposed area of possible zoning or development may be subject to a significant flood risk, a Stage 3 Detailed Flood Risk Assessment must be undertaken.

1.3 Scales of Flood Risk Assessments

Flood Risk Assessments are undertaken at different scales by different organisations for many different purposes. The scales are as follows:

- Regional Flood Risk Appraisal (RFRA): A Regional Flood Risk Appraisal provides a broad overview of the source and significance of all types of flood risk across a region and highlights areas where more detailed study will be required. These appraisals are undertaken by regional authorities.

- **Strategic Flood Risk Assessment (SFRA):** A Strategic Flood Risk Assessment provides a broad (area-wide or county-wide) assessment of all types of flood risk to inform strategic land use planning decisions. The SFRA allows the Planning Authority to undertake the sequential approach (described below) and identify how flood risk can be reduced as part of the development plan process.
- **Site Flood Risk Assessment (Site FRA):** A Site FRA is undertaken to assess all types of flood risk for a new development. This requires identification of the sources of flood risk, the effects of climate change on the flood risk, the impact of the proposed development, the effectiveness of flood mitigation and management measures and the residual risks that then remain.

2 Flood Risk Assessment

2.1 Stage 1 Flood Risk Identification

This purpose of this stage is to identify whether there are any flooding or surface water management issues relating to the plan area that may warrant further investigation. Sources which were consulted are outlined below.

2.1.1 Regional Flood Risk Appraisal

A Regional FRA was carried out and published as Appendix 3 to the Strategic Environmental Assessment of the South East Regional Planning Guidelines, 2010. This document provided guidance on the issues to be addressed in any Strategic Flood Risk Assessment.

The Regional FRA referred to the Suir Catchment Flood Risk Management Plan, which identified areas of potential significant flood risk within the Suir Catchment in Co. Kilkenny as Fiddown, Mullinavat and Piltown. No reference was made to the Ferrybank/Belview area in this RFRA.

2.1.2 Strategic Flood Risk Appraisal

A Strategic Flood Risk Assessment for the county was published in 2011 as part of Variation No. 2 to the County Development Plan. This examined the level of information available on flooding in the county and assessed all settlements affected by the variation for the presence of flood risk indicators. This did not cover the Ferrybank/Belview LAP as the Variation did not propose any change to the zoning therein.

Waterford City Council are undertaking a Strategic Flood Risk Assessment as part of the review of their Development Plan (2007-2013), but no information is available to date.

2.1.3 OPW Publications in development

2.1.3.1 Preliminary Flood Risk Management

The 'Floods' Directive¹ requires Member States to undertake a national preliminary flood risk assessment by 2011 to identify areas where significant flood risk exists or might be considered likely to occur. Member States are also required to prepare catchment-based Flood Risk Management Plans (FRMPs) by 2015 that will set out flood risk management objectives, actions and measures. The OPW are preparing Preliminary Flood Risk

¹ Directive 2007/ 60/ EC of the European Parliament and of the Council of 23rd October 2007 on the assessment and management of flood risk: Official Journal L288/ 27-34.

Management maps, but these are not available for use yet. When this is finished, which is scheduled for late in 2011, this mapping will be an important and primary input into future flood risk assessment studies.

2.1.3.2 Catchment Based Management Plans

The OPW in co-operation with various Local Authorities are producing Catchment Flood Risk Assessment and Management Studies. These CFRAMS aim to map out current and possible future flood risk areas and develop risk assessment plans. They will also identify possible structural and non-structural measures to improve the flood risk of the area. A few studies are being piloted around the country, and one of these is for the Suir catchment area.

A scoping of the CFRAMS for the Suir Catchment identified Fiddown, Mullinavat and Piltown as areas of potential significant flood risk, however the study is on-going.

The South Eastern River Basin District (SERBD) CFRAMS will cover the rest of County Kilkenny, and this study was due to commence in summer 2011. The flood mapping from the CFRAMS studies will be provided by the end of 2013.

In the absence of flood zone maps from the OPW and in the absence of completed CFRAM studies, alternative sources of information will be used.

2.1.4 Available sources

The data listed below is available and provides information on the historical occurrence of flooding. Flooding and surface water issues in the county were also identified through consultation with the Area Engineer and from any other relevant sources.

i) Office of Public Works OPW Flood Events Mapping

As part of the National Flood Risk Management Policy, the OPW developed the www.floodmaps.ie web based data set, which contains information concerning historical flood data, displays related mapped information and provides tools to search for and display information about selected flood events.

ii) OPW Benefitting Lands mapping

These maps were prepared to identify areas that would benefit from land drainage schemes, and typically indicate low-lying land near rivers and streams that might be expected to be prone to flooding.

iii) Mineral Alluvial Soil Mapping

The soils and subsoils maps were created by the Spatial Analysis Unit, Teagasc. The project was completed in May 2006 and was a collaboration between Teagasc, Geological Survey of Ireland, Forest Service and the EPA. The presence of alluvial soils can indicate areas that have flooded in the past (the source of the alluvium).

iv) Ordnance Survey "Lands liable to floods" mapping (6" OS maps)

These maps have been studied to see if there are any areas marked as being "Liable to Floods" in or in the vicinity of the zoned areas. It is noted that the OS maps simply show the text "Liable to Floods" without delineating the extent of these areas.

It should be noted that some of this data is historically derived, not prescriptive in relation to flood return periods and not yet predictive or inclusive for climate change analysis. Many of these maps were based on survey work carried out from 1833-1844 with many updated in the 1930s and 1940s. Therefore they do not show or take account of recent changes in surface drainage, such as development in floodplains, road realignments or drainage works for forestry or agriculture. So there is significant potential that flood risk in some areas may have increased or been reduced since they were prepared.

2.1.4.1 Flood Studies, Reports and Flood Relief Schemes

No flood reports have been completed for the Ferrybank/Belview area.

Waterford City Council and the OPW are at present implementing a Flood Relief Scheme for Waterford city. Phase I of the scheme (St. John's River) was opened in May 2011 and this consists of works on the River Suir upstream of its confluence with St. John's River, and on the John's River northern bank to Hardy's Bridge. When completed, the Flood Relief Scheme will protect against a 1-in-200 year flood event.

No flood zone maps were available, but according to RPS Consulting Engineers who worked on the Waterford Flood Relief Scheme, the 100 year design flood level is 3.11m OD and they have estimated the 1,000 year flood level to be 3.5m OD². An examination of the contours in the Ferrybank/Belview area (at 10m intervals), shows that most of the land lies above the 10m level. Only one area which lies within a 10m contour line has been included as an area of flood risk indicators, based on this information.

2.1.4.2 Local Authority Personnel

The Area Engineer was also consulted regarding historical flooding and flood relief works in the area.

2.1.5 Flood Risk Indicators

Having regard to all of the information sources as outlined above, the occurrence of flood risk indicators in the plan area is identified in a Flood Risk Indicator Matrix. The full extent of any indicators present have also been mapped and enclosed by a dashed line. As a number of locations could be subject to a potential flood risk issue, the assessment proceeds to Stage 2.

2.2 Stage 2 Initial Flood Risk Assessment

The purpose of this stage is to ensure that all relevant flood risk issues are assessed in relation to the decisions to be made and potential conflicts between flood risk and development are addressed to the appropriate level of detail.

Zoning proposals in each area:

A total of 8 areas of flood risk have been identified through Stage 1. These will now be assessed individually, considering the development proposed under this amendment for each site.

Area 1: Grannagh Business, Industrial and Technology park

Most of the area is zoned for Passive Open Space, with a small strip to the west zoned for Business, Industry and Technology Parks. No change is proposed to the zoning under this Amendment.

Area 2: Large area of approx. 92 hectares in Newrath encompassing the M9 and N25 interchange and the River Blackwater and Smartscastle Stream.

The bulk of this area is zoned Passive Open Space and Agriculture. Some small pockets are zoned for Retail Park, Commercial and Business, Industrial and Technology Parks. There is no change proposed to the zoning under this Amendment.

Area 3: Christendom, on the north bank of the River Suir

This area is zoned for Passive Open Space. No change is proposed to the zoning under this Amendment.

Area 4: Area running south from Milepost village to Gyles' Quay.

² Email communication 10th June 2011

This area is zoned for Passive Open Space. No change is proposed to the zoning under this Amendment.

Area 5: Area running south from Kilmurry Castle to River Suir

This area is zoned for Passive Open Space and Agriculture. No change is proposed to the zoning under this Amendment.

Area 6: Belview

This is a large area of approximately 44 hectares. The majority of the area is zoned for Passive Open Space, with some small pockets zoned for Specialist Industrial Activity and Pharmaceutical, Industry and Technology. No change is proposed to the zoning under this Amendment.

Area 7: Small area in Gorteens

The majority of this area is zoned for Passive Open Space. A small proportion is zoned for Specialist Industrial Activity. No change is proposed to the zoning under this Amendment.

Area 8: Drumdowney Lower and Gorteens, along Mill Race

The majority of this area is zoned for Passive Open Space. A small proportion is zoned for Development of Port Facilities and Industry. No change is proposed to the zoning under this Amendment.

As can be seen, there are five areas with potential conflicts between development and flood risk. However, under this Amendment, none of these areas are subject to a change in zoning. Therefore, for the purposes of this Amendment, these areas will be identified on a Flood Risk map to accompany the Plan and a policy will be included to state that any development proposal in these areas will be subject to a site specific Flood Risk Assessment appropriate to the type and scale of the development being proposed.

In the absence of flood zone mapping for the area, this mitigation measure will ensure that any development taking place will not exacerbate any flooding issue.

As these areas were zoned as part of the Ferrybank 2009 LAP, and in most cases, and as a mitigation measure has now been included to ensure any development taking place will not exacerbate any flooding issue, it is not considered necessary at this stage to proceed to Stage 3, Detailed Flood Risk Assessment.

3 Recommendations

The CDP 2008-2014 as varied by Proposed Variation 2, contains text and policies on flooding in Section 9.12.5 (Policies IE89-94). For the areas identified through the SFRA that contain flood risk indicators, a policy is proposed for inclusion in the County Development Plan to ensure that development proposals shall be the subject of a site-specific Flood Risk Assessment, appropriate to the type and scale of the development being proposed and shall be carried out in line with the Guidelines.

As can be seen, there are five areas in the Ferrybank/Belview LAP with potential conflicts between development and flood risk. However, none of these areas are subject to zoning changes under this Amendment. Therefore, for the purposes of this Amendment these areas will be identified on a Flood Risk map to accompany the Plan.

Although these mapped areas of flood risk indicators are not reliable as a flood extent, they do provide an indication that further assessment of flood potential may be required. These areas are identified on the map as "Areas within which development proposals will be the subject of site-specific Flood Risk Assessment appropriate to the type and scale of the development being proposed". A policy will be included in the Section 2.11.3 of the Plan referring to this requirement.

Flood Risk Indicator Matrix

Area	Available Data by source					
	www.floodmaps.ie	Alluvial Soils	Benefitting lands	6" OS maps	Local Authority information	Other
Ferrybank	Recurring flood incident point recorded at Redbridge. One commercial property has been affected, Redbridge Garage and the road is impassable up to six times a year. Last recorded information was 2005.	Alluvial soils mapped along River Blackwater and River Suir to west, and along north south channels to east of plan area.	Benefitting lands mapped along River Blackwater to west, at edge of River Suir, and to east of the plan area along Mill Race.	Area at Granny Bridge along River Blackwater and one area in Drumdowney to east of plan area marked as "Liable to Floods" along Mill Race.	Additional – pluvial flooding takes place on the Abbeylands Road adjacent the Waterford City boundary. There is an existing drainage system in place but it is inadequate and an alternative is required to resolve the problem.	Suir CFRAM. RPS Consulting Engineers (Waterford Flood Relief Scheme)

3.1 Changes to Local Area Plan text

Text to be inserted is in *italics* and text to be deleted is in ~~strikethrough~~.

2.11.3 Analysis – Surface Water Quality, Drainage systems and Flood Control

~~Drainage systems in the area currently serve the existing residential neighbourhoods. The gradients fall naturally towards the River Suir in these residential areas, so there are no major problems with drainage.~~

~~There are no flooding problems in the area except in the Newrath area adjacent to the River Suir, which suffers from tidal flooding and occasionally leads to flooding on the N9. This road will eventually become a local access road when the new Waterford City N25 by-pass is opened. This LAP seeks to protect all stream and river corridors from development, with opportunities for storm water attenuation ponds in the proposed areas of open space, so as to ensure the water quality of rivers and streams is maintained.~~

Flood risk in the Plan area will be managed through compliance with the Planning System and Flood Risk Management – Guidelines for Planning Authorities 2009.

The Guidelines outline three key principles that should be adopted by regional authorities, local authorities, developers and their agents when considering flood risk. These are:

- *Avoid the risk, where possible,*
- *Substitute less vulnerable uses, where avoidance is not possible, and*
- *Mitigate and manage the risk, where avoidance and substitution are not possible*

Flood Management Strategy

The Council shall adopt a comprehensive risk-based planning approach to flood management to prevent or minimise future flood risk. In accordance with the Guidelines, the avoidance of development in areas where flood risk has been identified shall be the primary response.

Proposals for mitigation and management of flood risk will only be considered where avoidance is not possible and where development can be clearly justified with the guidelines' Justification Test.

Avoidance of development in flood risk areas

Flood zones are geographical areas within which the likelihood of flooding is in a particular range and they are a key tool in flood risk management within the planning process as well as in flood warning and emergency planning. There are three types or levels of flood zones defined for the purposes of the guidelines:

- *Flood zone A – where the probability of flooding is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding) and where a wide range of receptors would be vulnerable;*
- *Flood zone B – where the probability of flooding is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding); and*
- *Flood zone C – where the probability of flooding is low (less than 0.1% or 1 in 1000 for both river and coastal flooding).*

As part of the Strategic Environmental Assessment Screening for Amendment No. 1, a Flood Risk Assessment was carried out. This did not identify Flood Zones, but has identified a total of eight areas in Ferrybank/Belview within which development proposals shall be the subject of a site-specific Flood Risk Assessment. This FRA shall be appropriate to the type and scale of the development being proposed and shall be carried out in line with the Guidelines.

ENP3 Surface Water Quality, Drainage Systems and Flood Control

ENP3.1 Ensure that the water quality of the rivers Pollanassa and Blackwater is maintained to a satisfactory level under the local authority's power and duty as Water Services Authority and Pollution Control Authority

ENP3.2 Generally prevent the alteration of the natural drainage systems in the area and when development occurs ensure mitigation measures to minimise the risk of flooding and impacts on water quality (including run-off, erosion and sedimentation).

ENP3.3 Ensure that natural surface water storage sites such as prominent wetlands are, to a significant degree, protected, as these help regulate stream flows recharge groundwater and screen pollutants.

ENP3.4 Promote public awareness on how to maintain water quality and reduce waste.

ENP3.5 Prohibit the landfilling of wetlands. Landfilling should only be allowed in case of overriding need.

ENP3.6 Promote stormwater retention facilities for new developments and existing catchment areas, particularly where developments are proposed in proximity to an existing open water course or stream in the plan area.

ENP3.7 ~~Ensure that due consideration is given to the Applications for development in lands identified on the FRA map, shall be the subject of a site-specific Flood Risk Assessment appropriate to the type and scale of the development being proposed, in line with the DoEHLG Guidelines "The Planning System and Flood Risk Management" (September 2008 November 2009).~~

ENP3.8 ~~In areas at risk from flooding, particularly at riverside locations, a precautionary approach will apply and the methodology set out in the DoEHLG Guidelines 'The Planning System and Flood Risk Management' will be applied to development proposals.~~

~~For any development, where flood risk may be an issue, a flood risk assessment should be carried out that is appropriate to the scale and nature of the development and the risks arising. The applicant is primarily responsible in the first instance for assessing whether there is a flood risk issue and how it will be addressed in the development they propose.~~

ENP3.9 *Development that is vulnerable to flooding will not be permitted in an area identified as subject to flood risk without a site specific flood risk assessment. Any development will not be permitted unless the criteria as set out in the Justification Test are satisfied.*

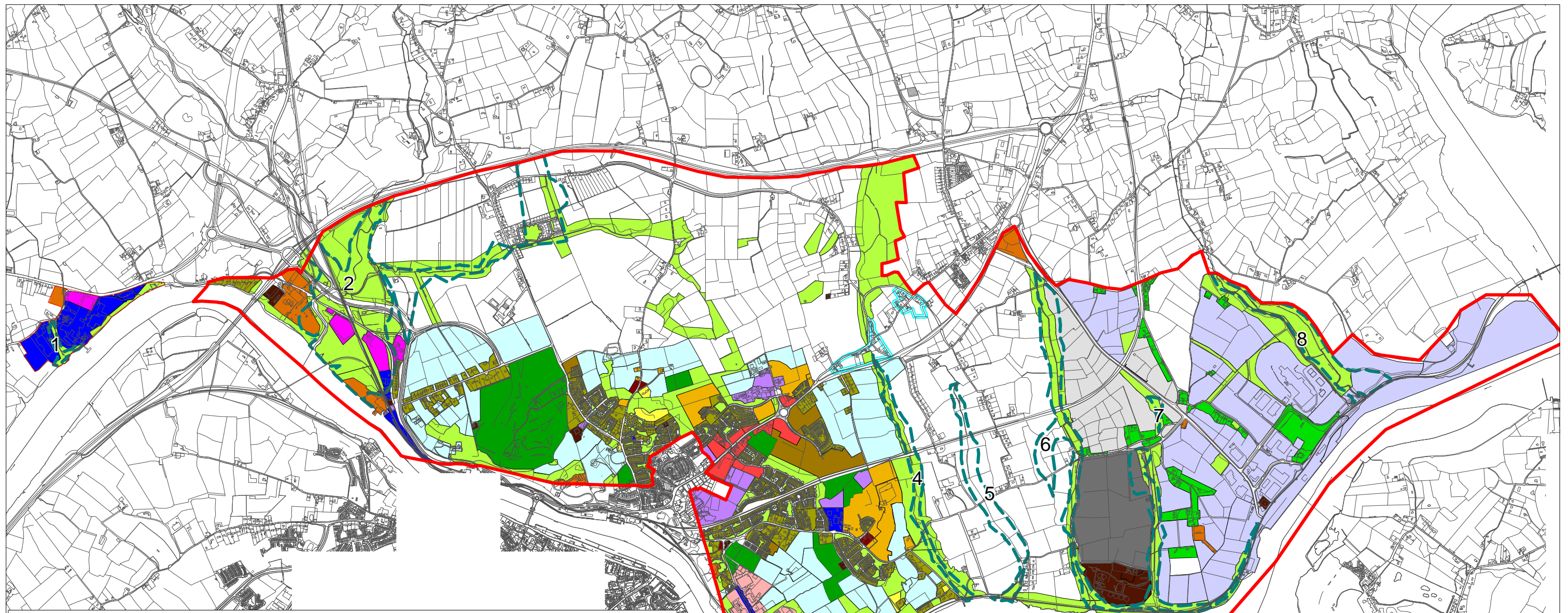
3.2 MONITORING AND REVIEW

As outlined in Section 2, additional information will be made available from the OPW later this year that will inform flood risk assessments in the County. The review of the County Development Plan (2008-2014) will commence in 2012, and at that stage a comprehensive Strategic Flood Risk Assessment will be carried out. The Ferrybank/Belview LAP will be reviewed in 2015 (if the period of the plan is not extended under Section 19 (1)(d) of the Planning and Development Act as amended).

It is recommended that the OPW be consulted and that their progress in implementation of the requirements of the EU Flood Directive is reviewed prior to the preparation of the next County Development Plan and the next Ferrybank LAP.

























This FRA is based on currently available data and in accordance with its status as a "living document" it will be subject to modification by these emerging datasets of maps and plans as they become available. In the interim any development proposal in the areas identified in this FRA shall be subject to detailed flood risk assessment.



Section 4: Map of Flood Risk Indicators in Ferrybank/Belview



**Proposed Amendment 1 to Ferrybank/Belview Local Area Plan
Strategic Environmental Assessment Screening Appendix 1**

Legend

- | | |
|---|---|
|  C1 - Urban Village |  POS - Passive Open Space |
|  C2 - Commercial and Mixed Uses |  AOS - Active Open Space |
|  C3 - Commercial |  AG - Agricultural |
|  R0 - Arcadian Low Density |  Phase 2 |
|  R1 - Residential Low Density |  Milepost Infill Zone |
|  R2 - Residential Low-Med Density |  BITP - Business, Industry and Technology Parks |
|  R3 - Residential Medium Density |  PIT - Pharmaceutical, Industry & Technology |
|  RE - Protect & enhance existing Residential Amenity |  SIA - Specialist Industrial Activity |
|  BRA - Belview Residential Amenity |  PFI - Development of Port Facilities & Industry |
|  NC - Neighbourhood Centres |  Study area |
|  CF - Community Facilities |  Development to create new urban street front |
|  PU - Public Utility | |
|  RP - Retail Park | |

- | |
|---|
|  Study Area Boundary |
|  Area within which any development proposal will be the subject of site-specific Flood Risk Assessment appropriate to the type and scale of the development being proposed |

Date: August 2011
Scale: 1:30,000 @ A3