Appendix II

Draft Strategic Flood Risk Assessment

Comhairle Bhaile Áth Í

Athy Town Council

DRAFT STRATEGIC FLOOD RISK ASSESSMENT

ATHY TOWN DEVELOPMENT PLAN 2012 ~ 2018

Kildare County Council **Planning Department** **Aras Chill Dara** **Devoy Park** **Naas** **County Kildare**	**10-033-DAR4**	**Kilgallen & Partners** **Consulting Engineers** **Well Road,** **Kylekiproe** **Portlaoise** **Co. Laois**
March 2011		

KILGALLEN & PARTNERS
CONSULTING ENGINEERS

REVISION HISTORY

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Title:	**DRAFT STRATEGIC FLOOD RISK ASSESSMENT**

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1.0 INTRODUCTION

1.1 Requirement for Flood Risk Assessment

Athy Town Council is in the process of preparing a new Town Development Plan (CDP) for the period 2012~2018 in accordance with the requirements and provisions of the Planning and Development Act 2000 (as amended).

In accordance with Section 28 of the Planning and Development Act 2000 as amended, the planning authority shall have regard to any guidelines issued by the Minister of the Environment, Heritage and Local Government to planning authorities in the performance of their functions including the preparation of Development Plans.

In September 2008 the Minister of the Environment, Heritage and Local Government published Draft Planning Guidelines on the Planning System and Flood Risk Management for public consultation. The Guidelines were prepared in response to the recommendations of the National Flood Policy Review Group and focused on providing for comprehensive consideration of flood risk in preparing Regional Plans, Development Plans and Local Area Plans, and in determining applications for planning permission.

Following on from the consultation process the Minister published statutory planning guidelines entitled *"The Planning System and Flood Risk Management – Guidelines for Planning Authorities"* on 30 November 2009 which incorporate flood risk assessment and management into the planning system. These Guidelines were issued under Section 28 of the Planning and Development Act 2000 as amended, and require Planning Authorities to introduce flood risk assessment as an integral and leading element of their development planning functions. This is achieved by ensuring that the various steps in the process of making a development plan, together with the associated Strategic Environmental Assessment (SEA), are supported by an appropriate Strategic Flood Risk Assessment (SFRA).

Kilgallen and Partners Consulting Engineers have been appointed by Athy Town Council to undertake a Strategic Flood Risk Assessment (SFRA) for the Athy Town Development Plan 2012~2018 in accordance with the Guidelines referenced above.

It is recommended that the SFRA is adopted as a 'Living Document' and reviewed regularly and updated with any new relevant information that may become available during the lifetime of the Athy Town Development Plan 2012~2018.

It is the responsibility of each applicant for planning permission to determine the flood risk pertaining to the lands on which development is proposed and to include appropriate mitigation works as part of the proposed development for which permission is sought.

1.2 The Planning Guidelines and Flood Risk Management

The assessment of flood risk requires an understanding of the source of the floodwaters, the process and direction of flow and the people and assets affected by flooding. The Guidelines introduce the mechanism of Flood Risk Assessment (FRA) into the planning process by the incorporation of flood risk identification, assessment and management.

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 growth;
- Improve the understanding of flood risk among relevant stakeholders;
- Ensure that the requirements of the EU and national law in relation to the natural environment and nature conservation are complied with at all stages of flood risk management.

These core objectives are achieved through the process of Flood Risk Assessments. The level of detail required for a Flood Risk Assessment depends on the purpose of the FRA. In the subject case of the making of the Athy Town Development Plan 2012~2018, a Strategic Flood Risk Assessment (SFRA) is required to inform that plan making process.

To achieve the objectives of the Guidelines, the following principles are applied:

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

1.3 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 1.4.2 herein) 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.

1.4 The Flood Risk Assessment Process for the Planning Authority

1.4.1 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.

1.4.2 The Sequential Approach

The sequential approach in terms of flood risk management is based on the following principles: **AVOID - SUBSTITUTE - JUSTIFY - MITIGATE – PROCEED.**

The primary objective of the sequential approach is that development is primarily directed towards land that is at low risk of flooding (AVOID).

The next stage is to ensure that the type of development proposed is not especially vulnerable to the adverse impacts of flooding (SUBSTITUTION).

The Justification Test is designed to rigorously assess the appropriateness, or otherwise, of particular developments that, for various reasons, are being considered in areas of moderate or high flood risk (JUSTIFICATION). The test is comprised of two processes, namely The Plan-Making Justification Test and The Development Management Justification Test. Only the former (Plan-Making Justification Test) is relevant to a Strategic Flood Risk Assessment for a Development Plan, and this is described as follows.

<u>The Plan-Making Justification Test</u>

Where, as part of the preparation and adoption of a development / local area plan, a planning authority is considering the future development of areas in an urban settlement that are at moderate or high risk of flooding, for uses or development vulnerable to flooding that would generally be inappropriate as set out in the Guidelines, all of the criteria listed below, as stated in the Guidelines, must be satisfied. This is referred to as the "*Justification Test For Development Plans":*

(I) The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans as defined above or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act 2000, a amended.

(II) The zoning or designation of the lands for the particular use or development type is required to achieve the proper and sustainable planning of the urban settlement and in particular:

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

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

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

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

(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.

(III) 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."

MITIGATION is the process where the flood risk is reduced to acceptable levels by means of land use strategies or by means of detailed proposals for the management of flood risk and surface water, all as addressed in the Flood Risk Assessment.

The decision to PROCEED should only be taken after the Justification Test has been passed.

1.5 Key Outputs from the SFRA

The key outputs are:

- To provide for an improved understanding of flood risk issues within the Development Plan and development management process, and to communicate this to a wide range of stakeholders;
- To produce an assessment of existing flood defence infrastructure and the consequences of failure of that infrastructure and to identify areas of natural floodplain to be safeguarded;
- To produce a suitably detailed flood risk assessment that supports the application of the sequential approach in key areas where there may be tension between development pressures and avoidance of flood risk;
- To inform, where necessary, the application of the Justification Test;
- To conclude whether measures to deal with flood risks to the area proposed for development can satisfactorily reduce the risks to an acceptable level while not increasing flood risk elsewhere;
- To produce guidance on mitigation measures, how surface water should be managed and appropriate criteria.

2.0 FLOOD RISK

2.1 Components of Flood Risk

Flood Risk is defined as a combination of the likelihood of flooding occurring and the potential consequences arising from that flooding.

The likelihood of flooding is defined in the Guidelines as follows:

"Likelihood of flooding is normally defined as the percentage probability of a flood of a given magnitude or severity occurring or being exceeded in any given year."

The consequences of flooding depend on the following:

"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)."

2.2 Source-Pathway-Receptor Model

The Source – Pathway – Receptor Model (SPR Model) is a widely applied model which is used to assess and inform the management of environmental risk.

- **Source -** The origin of a hazard (for example, heavy rainfall, strong winds, surge etc).
- **Pathway -** Route that a hazard takes to reach Receptors. A pathway must exist for a Hazard to be realised.
- **Receptor -** Receptor refers to the entity that may be harmed (a person, property, habitat etc.).

For example, in the event of heavy rainfall *(the source) flood* water may propagate across the flood plain *(the pathway)* and inundate housing *(the receptor).* The vulnerability of a receptor can be modified by increasing its resilience to flooding.

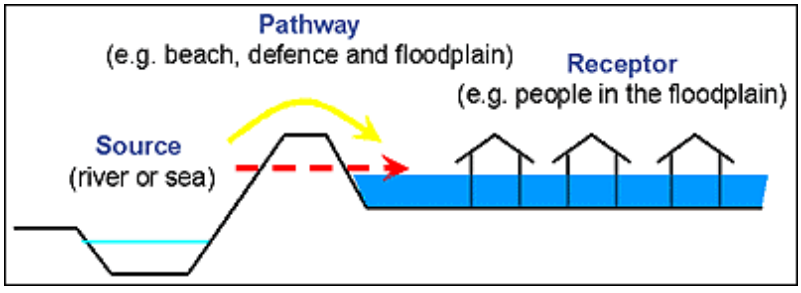


Figure 1: Source-Pathway-Receptor Model (adapted from www.floodsite.net)

3.0 EUROPEAN, NATIONAL AND REGIONAL POLICY

3.1 European Policy

3.1.1 EU Floods Directive

http://ec.europa.eu/environment/water/flood_risk/index.htm

Directive 2007/60/EC on the assessment and management of flood risks became operative on 26th November 2007. This Directive requires Member States to assess the risks of flooding along all watercourses and coast lines. It also requires Member States to map the extent of potential flooding in each case, determine the assets and humans at risk in the areas and to take adequate and coordinated measures to reduce this flood risk. The aim of the Directive is to reduce and manage the risks posed by flooding to human health, the environment, cultural heritage and economic activity.

Member States are required by 2011 to carry out a preliminary assessment identifying the river basins and the coastal areas at risk of flooding. For such zones, flood risk maps are required to be drawn up by 2013 and Member States are required to establish flood risk management plans focused on prevention, protection and preparedness by 2015. The Directive applies to inland waters and to all coastal waters across the whole territory of the EU.

3.1.2 EU Water Framework Directive

www.wfdireland.ie

The Water Framework Directive, which came into force on December 22nd 2000, established a new and integrated approach to the protection, improvement and sustainable use of Europe's rivers, lakes, estuaries, coastal waters and groundwater. It impacts on the management of water quality and water resources and affects conservation, fisheries, flood defence, planning and environmental monitoring.

The primary focus of the Directive is to achieve 'good' ecological status for all waters by 2015.

3.2 National Policy

3.2.1 Planning Guidelines "The Planning System and Flood Risk Management"

The *Planning System and Flood Risk Management* Guidelines were prepared in response to the recommendations of the National Flood Policy Review Group and focused on providing for comprehensive consideration of flood risk in preparing Regional Plans, Development Plans and Local Area Plans, and in determining applications for planning permission.

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

3.2.2 Transposition and Implementation of the EU Floods Directive

On 19th March 2010, the Statutory Instrument transposing the EU 'Floods' Directive was signed into Irish law. The Statutory Instrument appointed the Commissioners of Public Works in Ireland as the Competent Authority under the Directive. The Statutory Instrument also identified roles for other organisations, such as the Local Authorities, Waterways Ireland and ESB, to undertake certain duties with respect to flood risk within their existing areas of responsibility.

3.2.3 Office of Public Works

The Office of Public Works is the lead agency for flood risk management in Ireland and is responsible for the coordination and implementation of Government policy on this issue. It is the primary agency responsible for ensuring Ireland's compliance with the EU Floods Directive and particularly for the preparation of a preliminary assessment by 2011, preparation of flood risk mapping by 2013 and preparation of flood risk management plans by 2015. It is the principal agency involved in the preparation of Catchment Flood Risk Assessment and Management Studies.

3.3 Regional Policy

3.3.1 Introduction

For the purposes of regional planning, the Mid-East Regional Authority and the Dublin Regional Authority have partnered to produce Regional Planning Guidelines for the Greater Dublin Area (www.rpg.ie).

On the 15th of June 2010, Regional Planning Guidelines for the Greater Dublin Area 2010~2022 were made. The guidelines give regional effect to the National Spatial Strategy and guide the development plans in each Local Authority area. The guidelines have effect for six years.

The guidelines contain a Regional Flood Risk Appraisal (RFRA), which is a high-level broad-brush appraisal of flood risk across an entire regional authority area, based on existing readily available information.

Paragraphs 3.3.2 to 3.3.5 herein present a summary of the Regional Flood Risk Appraisal together with an outline of the main outputs of relevance to the Athy Town Development Plan 2012~2018.

3.3.2 Regional Flood Risk Appraisal Process

The RFRA process examines the issue of major flood risk from river, estuarine and coastal flooding and does not examine groundwater or artificial drainage flood events. The process of preparing the RFRA involved the mapping of historical flood events in the Greater Dublin Area (GDA) to provide a general indication at a regional scale of where flood vulnerable locations are located in the GDA.

The mapping of alluvial soils indicating flood plain locations in the GDA was also examined at a regional level.

The studies indicate that significant sections of the built up area of Dublin together with key towns in the GDA are vulnerable to flooding, particularly along the coast, near estuaries and lands proximate to the rivers flowing through the region.

3.3.3 Strategic Policies and Recommendations for Regional Flood Risk Management

- **Strategic Policy FP1:** That flood risk be managed pro-actively at all stages in the planning process by avoiding development in flood risk areas where possible and by reducing the risks of flooding to and from existing and future development.
- **Strategic Recommendation FR1:** New development should be avoided in areas at risk of flooding. Alongside this, the Regional Flood Risk Appraisal recognises the need for continuing investment and development within the

urban centres of flood vulnerable designated growth towns and the City and for this to take place in tandem with the completion of Catchment Flood Risk Assessment and Management (CFRAM) Studies and investment in comprehensive flood protection and management.

- **Strategic Recommendation FR2:** Development and Local Area Plans should include a Strategic Flood Risk Assessment and all future zoning of land for development in areas at risk of flooding should follow the sequential approach set out in the Departmental Guidance on Flood Risk Management. All Flood Risk Assessments and CFRAM studies should take place in coordination and consultation with adjoining local authorities and regions and in coordination with the relevant River Basin Management Plans.
- **Strategic Recommendation FR3:** Local authorities should take the opportunities presented to optimise improvements in biodiversity and amenity when including policies and actions in development plans/local area plans (such as flood plain protection and SuDS) for existing and future developments.
- **Strategic Recommendation FR4:** Plans and projects associated with flood risk management that have the potential to negatively impact on Natura 2000 sites will be subject to a Habitats Directive Assessment (HDA) according to Article 6 of the habitats directive and in accordance with best practice and guidance.

3.3.4 Role of Local Authorities (from RFRA)

Local Authorities must take account of the issues raised in this Regional Flood Risk Appraisal and undertake Strategic Flood Risk Assessment for future Development and Local Area Plans in line with the Department's Guidance on the Planning System and Flood Risk Management Guidelines. Local Authorities should ensure that they adhere to the principles of avoiding risk where possible in preparing such future Plans.

The Regional Planning Guidelines seek to emphasise the need to protect across the Greater Dublin Area the natural flood plains and riparian corridors of all rivers that have not already been built on, and seek that this is explicitly stated and spatially designated in all future Development and Local Area plans following the completion of CFRAM studies for the area in question. In the absence of the CFRAM studies, Planning Authorities should identify the areas at risk using other data such as data that is available from the OPW, available historical information (mapped or otherwise), and if necessary, through additional studies or investigations.

Land required for current and future flood management should be safeguarded from development.

Allocation of future areas for development as extensions to existing built up areas, villages or towns should follow a sequential approach; be within the lowest risk sites

appropriate for the development; and should include adequate provision for adaptation to, or protection against, the projected impacts of climate change.

3.3.5 Recommendations from Regional Flood Risk Appraisals

In the preparation of future Development and Local Area Plans, Local Authorities are advised to:

- Identify and consider at the earliest stage in the planning process flood hazard and potential risk.
- Identify flood risk areas on the Development Plan and Local Area Plan maps.
- Review existing Development Plans and Local Area Plans to ensure that the issue of Flood Risk has been addressed in a manner consistent with the Flood Risk Management Guidelines.
- Where lands are already zoned for housing or other vulnerable development in flood risk areas, the Planning Authority should undertake a re-examination of the zoning in accordance with the sequential approach. Regional Planning Guidelines may need to identify Plans which will require a variation to take account of flood risk assessments.
- Include policies which ensure that flood risk areas targeted for development following the sequential approach should be planned, designed and constructed to reduce and manage flood risk and be adaptable to changes in climate.
- Include policies to ensure that flood risk and impact is considered as a key element in the assessment of future waste and mineral planning strategies and developments.
- Include policies that ensure that the location of key infrastructure will be subject to flood risk assessment.
- Include policies on the importance of the inclusion of Sustainable Drainage Systems (SuDS) in future developments, in accordance with the recommendations of the Greater Dublin Strategic Drainage Study Guidelines and Appendix B of the Planning System and Flood Risk Management Guidelines.

Flooding events, whether widespread or localised, can cause serious damage to key infrastructure (e.g. power stations, sub-stations, communication hubs, wastewater treatment plants etc.). The cost of such disruption is significant to business, causes hardship to residents and also can place people in "at risk" situations. For this reason, it is recommended that on completion of Catchment Flood Risk Assessment and Management Studies and upon identification of areas of high flood risk in each Planning Authority area, that key infrastructure suppliers are advised of the risk to such installations and encouraged to assess current infrastructure for risk and stress test future projects against flood risk, where this has not been previously undertaken.

4.0 STRATEGIC FLOOD RISK ASSESSMENT – ATHY TOWN PLAN

4.1 Introduction

The Strategic Flood Risk Assessment provides an appraisal and assessment of available flood risk data for the land-use proposals within the boundaries of the Athy Town Development Plan 2012~2018. This process identifies flood risk indicators in each area and, where it is demonstrated that lands may be at risk of flooding, recommends modifications to land-use proposals or the carrying out of more detailed flood risk assessment as appropriate.

4.2 Available Flood Risk Data

Most of the data utilised is historically derived, not prescriptive in relation to flood return periods and not yet predictive or inclusive for climate change analysis.

4.2.1 Office of Public Works

The OPW is currently undertaking flood risk assessment mapping showing Areas of Potential Significant Flood Risk in collaboration with local authorities and other key agencies. Upon completion, it will become an important and primary source of input into future flood risk assessment studies.

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 and displays related mapped information and provides tools to search for and display information about selected flood events.

Additional mapped information, such as the Ordnance Survey of Ireland background maps, rivers, hydrometric gauge stations, drainage districts and land benefiting from drainage schemes is included as additional contextual information.

Figure 2 illustrates the locations of recorded flood events for the Athy area as shown on www.floodmaps.ie. Each flood event location is represented by a triangular symbol.

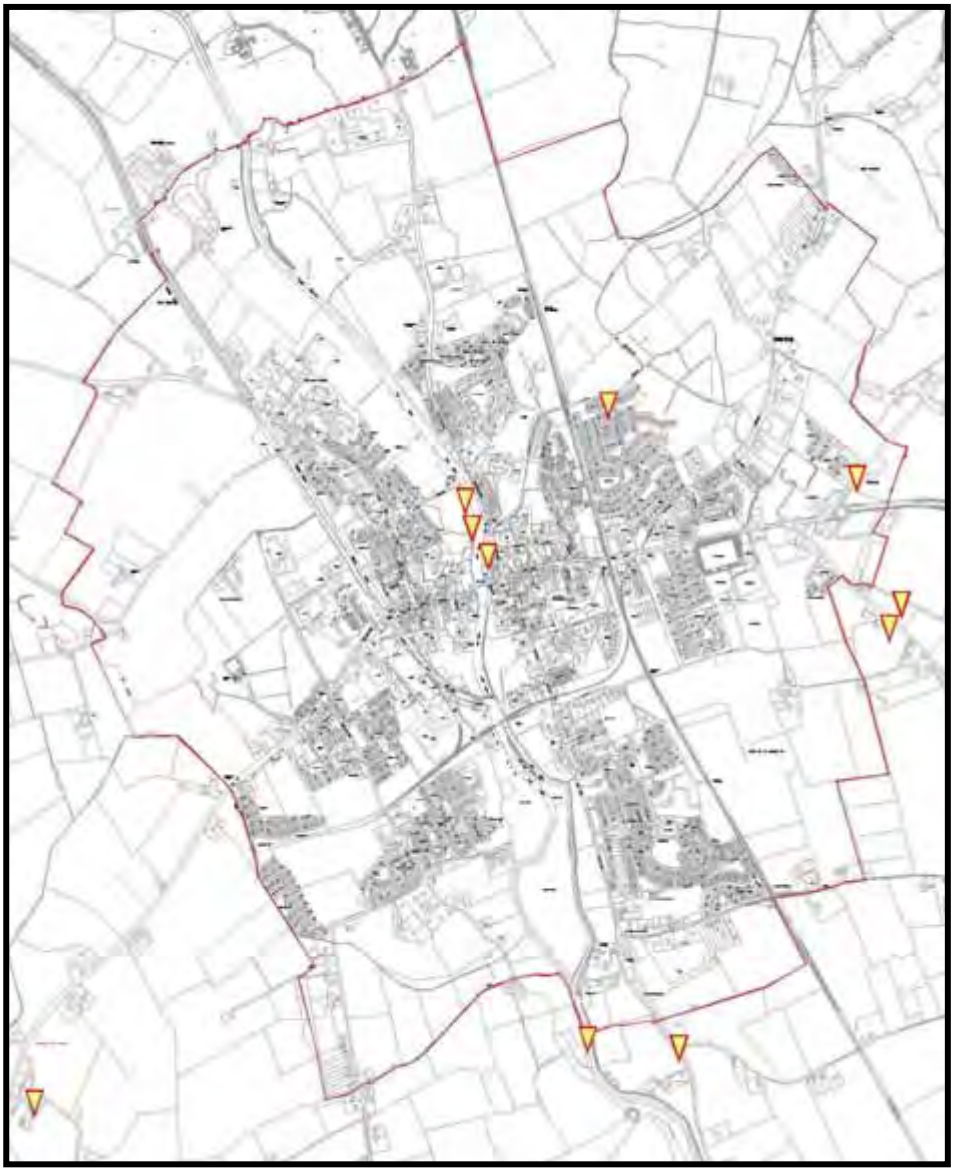


Figure 2:Recorded flood events shown on www.floodmaps.ie (OPW)

4.2.2 Barrow Drainage Board

The Barrow Drainage Board is tasked with the duty of maintaining the Barrow and its tributaries from its source in the Slieve Bloom mountains in County Offaly to the Horse Bridge in Athy. The Barrow Drainage Board was established under the Barrow Drainage Acts 1927 and 1933. Information obtained from the Barrow Drainage Board includes river cross-sections and historical mapping.

4.2.3 6" (1:10560) Ordnance Survey Maps

6" Ordnance Survey maps include areas which are marked as being "Liable to Floods". The exact areas are not delineated but give an indicative location of areas which have undergone flooding in the past. In addition, the maps indicate areas of wet or hummocky ground, bog, marsh, springs, rises and wells as well as surface water features including rivers, streams, bridges, weirs and dams.

4.2.4 Local Authority Personnel

Detailed consultations were held with Local Authority personnel regarding historical flooding and flood relief works in Athy.

4.2.5 Flood Studies, Reports and Flood Relief Schemes

Flood reports have been completed for a number of areas within County Kildare and many areas with a history of flooding have undergone flood relief works in the recent past.

A number of surface water / flood alleviation schemes are listed in the Capital Programme 2010 ~ 2012.

4.2.6 Aerial Photography

Aerial photographs taken by Kildare County Council of Athy and its surrounds on 23 November 2009 to record the ongoing flood event of that time.

4.3 Flood Risk Indicators

The Town of Athy (as designated in the Athy Town Development Plan 2012~2018) has been assessed for the presence of flood risk indicators by reference to the datasets described in Section 4.2. Table 1 provides a matrix showing these indicators at various locations throughout the Town.

		Location						
		West bank of the River Barrow north of Crom a boo Bridge. **(Located within townlands of Athy, Cardington Demesne and Townparks (Reban West))**	**East bank of the River Barrow north of Crom a boo Bridge** **(Located within townlands of Barrowford, Paudeenourstown, Rathstewart and Athy)**	**Lands adjoining Ballyadams River** **(Located within townlands of Ballybought (West By), Tonlegee, Ardrew, Blackparks, Bennet's Bridge and Woodstock South)**	**West bank of the River Barrow south of Crom a boo Bridge** **(Located within townlands of Athy, Bleach, Ardrew and Ballybought (Reban West By))**	**East bank of the River Barrow south of Crom a boo Bridge** **(Located within townlands of Athy, Coneyburrow (Reban West) and Ardree)**	**Lands adjoining Moneen River (Located within townlands of Athy, Clonmullin, Prusselstown, Paudeenourstown, Rathstewart and Tomard)**	**Prusselstown townland**
Information Source	**OS 6" Maps**	The River Barrow has been significantly altered along this bank. The river has been narrowed and the Mill Race and Mill Race Weir removed. Lands from Barrack Lane north along the west bank of the Barrow are all shown as 'Liable to Flood' with extensive areas of wet and marshy ground and a number of wells, springs and small streams.	Lands along the river below Barrowford House are marked as 'Liable to Flood'. A number of springs, drains and wells are indicated on the maps as well as marshy ground immediately adjacent to the river.	Lands in Ballybought north of the Ballyadams River are indicated in the maps as having standing water 'including water'. Large concentration of drains and watercourses in lands within Woodstock South townlands along N78 route.	Lands on the west bank of the River Barrow north of Ardreigh Island are marked as 'Liable to Flood'. Numerous pumps and springs are mapped in this area and small drains and watercourses. A large area of marshy or wet ground is indicated along the river bank.	A number of pumps and wells are located on the OS mapping. A large area of land known as Ardreigh Island is marked as 'Liable to Floods' and south towards Ardreigh House. Lands immediately east of Offaly Street are marked as 'including water' which is indicative of an area of standing water.	A number of wells and small watercourses are noted on the OS 6" mapping.	OS 6" mapping indicates a dense drainage network within this townland coupled with areas of marshy ground and the adjacent Moneen River.
	OPW	Lands shown as extensively flooded during August 2008 flood event.		Lands at the confluence of the Ballyadams River and the River Barrow were flooded during recent flood events.	Lands north of Barrow Lock have flooded in the past as well as immediately south of Barrow Lock. Flood events have been recorded along the west bank of the Barrow immediately beyond the town boundary map.	Ardreigh Island has been noted as having experienced flooding a number of times in the past. A section of roadway at Ardreigh Cross Roads (R417) has been noted as flooded in the past.	The Moneen River has flooded in the past.	
	Local Authority	Infiltration gallery and location of Barrack Well for groundwater supply located near west bank of River Barrow has been flooded frequently.	Lands along the river have flooded in recent past. Lands near St. Joseph's Terrace were impacted in November 2009.	Extensive flooding of lands along the Ballyadams River in November 2009. The Corrán Árd residential development was severely impacted by flooding during this flood event. Lands adjacent to the Ballyadams River north of the N78 national route were also flooded in the townland of Woodstock South.	Lands along the west bank of the River Barrow below Crom a boo Bridge have flooded in the recent past particularly those lands around the church.	Lands along the east bank of the River Barrow and the Barrow Navigation were flooded during the flood event in November 2009. Ardreigh Island has experienced significant flooding numerous times in the past.	Lands near the school at the confluence of the Moneen River and the River Barrow have flooded in the past. Recent significant flooding included November 2009.	

Table 1: Flood Risk Indicators for Athy

		Location						
		West bank of the River Barrow north of Crom a boo Bridge. (Located within townlands of Athy, Cardington Demesne and Townparks (Reban West))	**East bank of the River Barrow north of Crom a boo Bridge (Located within townlands of Barrowford, Paudeenourstown, Rathstewart and Athy)**	**Lands adjoining Ballyadams River (Located within townlands of Ballybought (West By), Tonlegee, Ardrew, Blackparks, Bennet's Bridge and Woodstock South)**	**West bank of the River Barrow south of Crom a boo Bridge (Located within townlands of Athy, Bleach, Ardrew and Ballybought (Reban West By))**	**East bank of the River Barrow south of Crom a boo Bridge (Located within townlands of Athy, Coneyburrow (Reban West) and Ardree)**	**Lands adjoining Moneen River (Located within townlands of Athy, Clonmullin, Prusselstown, Paudeenourstown, Rathstewart and Tomard)**	**Prusselstown townland**
Information Source	**Barrow Drainage Board**	Lands along this bank are indicated on the Barrow Drainage Board Maps as having flooded in the past.	The Barrow Drainage Board maps indicate lands along the bank of the River Barrow as having flooded from the town boundary to Crom a boo Bridge.		Lands between Barrow Lock and the church are indicted on the Barrow Drainage Maps as having flooded as well as lands immediately south of Barrow Lock.	Lands along the east bank of the River Barrow have flooded in the past.	Extensive lands marked as being vulnerable to flooding north and south of the Moneen River.	Large areas of land within Prusselstown townland are indicated as lying within areas which have experienced flooding in the past.
	Aerial Photographs	Extensive flooding observed from aerial photographs taken on 23 November 2009.	The areas which were noted as being part of the River Barrow on the OS 6" maps were flooded on 23 November 2009. This included a car park, grotto and lands surrounding White's Castle. Lands along the eastern bank of the River Barrow were flooded from Barrowford House to north of Rathstewart Crescent.	Lands adjacent to the Ballyadams River north of the N78 national route in the townland of Woodstock South were observed to be flooded. Lands at the confluence of the Ballyadams River and the River Barrow were severely flooded. Flooded areas were also observed adjacent to the River in Tonlegee as well as an area immediately east of Corrán Árd in Ardrew.	Extensive lands were observed under water along the full length of the west bank of the River Barrow from Crom a boo Bridge to the Athy town boundary and beyond on the 23rd November 2009.	Lands along the east bank of the Barrow Navigation and the whole of Ardreigh Island were observed as being under water. Emily Square experienced flooding as well as lands along the east bank of the River Barrow in the town centre. Lands south of the railway bridge over the River Barrow were noted as flooded.	Aerial photographs taken on 23rd November 2009 indicated extensive areas flooded along the banks of the Moneen River. Areas which were particularly affected included lands around the school near the River Barrow, Kilberry and Clonmullin. Areas in the townland of Prusselstown were also noted as under water.	
	Other			It was noted in local papers that floodwaters rose significantly between 22nd and 25th of November. The full extent of the flooding may not have been captured by the aerial photographs taken on 23rd November 2009.				Lands along the Moneen River within Prusselstown townland were observed to be under water from aerial photographs taken on 23 November 2009.

Table 1: Flood Risk Indicators for Athy *(continued)*

4.4 Recommendations for modification to or additional assessment of land-use proposals

The SFRA assessed the flood risk indicators listed in Table 1 in relation to the land-use proposals contained in the Draft Town Plan. Various areas were identified which may be at risk of flooding but which are being considered for types of development which are not generally compatible with flood risk areas *(i.e. developments which are classed as vulnerable in accordance with the criteria set out in the Planning System and Flood Risk Management Guidelines)*. Maps showing the land-use proposals of the Development Plan together with the location and extent of those areas for which additional assessment was recommended are included in Appendix 1.

A detailed FRA was carried out for these areas in accordance with these Guidelines and Flood Zones established for the 1 in 100year and 1 in 1000year flood events (Flood Zones A and B respectively). Maps showing the extent of these Flood Zones are included in Appendix 2 together with a description of the preparation of the detailed assessment. Land parcels being considered for types of development which are not generally compatible with flood risk were found to be located within Flood Zones A and B. In accordance with the Guidelines, the Justification Test was carried out for each land parcel where the encroachment of Flood Zones A and B is significant. Records of the Justifications Tests where the land-use proposals passed the Test are reproduced in full in Appendix 3.

Table 2 contains recommendations in regard to particular land parcels based on the Flood Indicators listed in Table 1, the detailed FRA described above and the Justification Tests carried out further to the detailed FRA.

Area	Recommendations *(refer to appendices 1 & 2 for associated mapping)*
Lands zoned A (Town Centre)	These lands passed the Justification Test and thus modification of the land-use classification is not a recommendation of the SFRA. However, it is recommended that development of these lands which is located within the 100year and 1000year Flood Zones be accompanied by a Site Specific Flood Risk Assessment appropriate to the nature and scale of development being proposed. Such Development Proposals shall also: (i) Indicate and quantify loss of floodplain storage arising from the development proposal; (ii) Provide compensatory storage located within or adjacent to the proposed development; (iii) Indicate measures to ensure that water-vulnerable elements of the Development would not be flooded during the 1000year flood; (iv) Ensure that existing flow paths for flood waters will not be compromised.
Lands zoned H (Industry & Warehousing) at Woodstock, Ballylynanan Rd	These lands did not pass the Justification Test. It is recommended that lands within the 100year and 1000year Flood Lines be re-classified for water compatible development only.
Lands zoned E (Community & Educational) located north of the Town Centre between the Barrow and the Railway Line.	These lands passed the Justification Test and thus modification of the land-use classification is not a recommendation of the SFRA. However, it is recommended that development of these lands which is located within the 100year and 1000year Flood Zones be accompanied by a Site Specific Flood Risk Assessment appropriate to the nature and scale of development being proposed. Such Development Proposals shall also: (i) Indicate and quantify loss of floodplain storage arising from the development proposal; (ii) Provide compensatory storage located within or adjacent to the proposed development; (iii) Indicate measures to ensure that water-vulnerable elements of the Development would not be flooded during the 1000year flood; (iv) Ensure that existing flow paths for flood waters will not be compromised.

Table 2 Specific Flood Risk Management Recommendations in relation to Land-use proposals

Area	Recommendations *(refer to appendices 1 & 2 for associated mapping)*
Lands zoned E located immediately north of the Town Centre and adjoining the western bank of the Barrow.	To avoid adverse impacts on surrounding lands, it is recommended that lands located within the 100year Flood Lines be re-zoned for water compatible development only. In addition, it must be a specific requirement that development within the 100year and 1000year Flood Lines incorporate mitigation measures to prevent flooding of the development and to avoid adverse impact on adjoining lands.
Lands zoned Q (Enterprise & Employment) adjoining the western bank of the Canal	These lands are substantially developed. However, proposals for further development of these lands shall be the subject of a site-specific Flood Risk Assessment appropriate to the type and scale of the development being proposed. It is recommended that further development of these lands be required to incorporate mitigation measures that: (i) Indicate and quantify loss of floodplain storage arising from the development proposal; (ii) Provide compensatory storage located within or adjacent to the proposed development; (iii) Indicate measures to ensure that water-vulnerable elements of the Development would not be flooded during the 1000year flood; (iv) Ensure that existing flow paths for flood waters will not be compromised.
Lands zoned B (Existing Residential and Infill Development) located within Flood Zones A & B	These lands are substantially developed. However, proposals for further development of these lands shall be the subject of a site-specific Flood Risk Assessment appropriate to the type and scale of the development being proposed. It is recommended that further development of these lands be required to incorporate mitigation measures that: (i) Indicate and quantify loss of floodplain storage arising from the development proposal; (ii) Provide compensatory storage located within or adjacent to the proposed development; (iii) Indicate measures to ensure that water-vulnerable elements of the Development would not be flooded during the 1000year flood; (iv) Ensure that existing flow paths for flood waters will not be compromised.

Table 2 Specific Flood Risk Management Recommendations in relation to Land-use proposals *(continued)*

Area	Recommendations *(refer to appendices 1 & 2 for associated mapping)*
Lands zoned C6, C21 & C25 (New Residential)	Development proposals for these lands shall be the subject of a site-specific Flood Risk Assessment appropriate to the type and scale of the development being proposed.
Lands zoned C3, C4, C5 & C32 (New Residential)	A significant proportion of each of these land parcels is located within Flood Zones A and B. These lands did not pass the Justification Test. It is recommended that in each case, the entire land parcel be re-classified for water compatible development only.
Lands zoned C12, C26, C27 & C33 (New Residential)	While a proportion of each of these land parcels is located within Flood Zones A and B, in each case the proportion is not sufficient to prevent appropriate development within the overall parcel. The layout and design of development on these lands should be such that water vulnerable features are located outside of the Flood Zones A and B.

Table 2 Specific Flood Risk Management Recommendations in relation to Land-use proposals *(continued)*

4.5 Forthcoming Information to Inform Future Flood Risk Consideration

Ireland is required under the EU Floods Directive to carry out Preliminary Flood Risk Assessments of their river basins and associated coastal zones by 2011. By 2013 flood hazard maps and flood risk maps must be produced for areas where real risks of flood damage exist. By 2015 Flood Risk Management Plans must be drawn up for each of these zones.

The OPW has developed a Catchment Flood Risk Assessment and Management (CFRAM) Programme, which lies at the core of the assessment of flood risk and the long-term planning of the flood risk management measures throughout the country, including capital structural and non-structural measures. The CFRAM Programme will, as well as delivering on national policy, meet the requirements of the EU 'Floods' Directive that came into force in November 2007. This Directive requires the production of flood maps for the Areas of Potentially Significant Risk by the end of 2013, and the development of Flood Risk Management Plans to manage risk within the Areas of Potentially Significant Risk by the end of 2015.

This SFRA 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.

5.0 MONITORING AND REVIEW

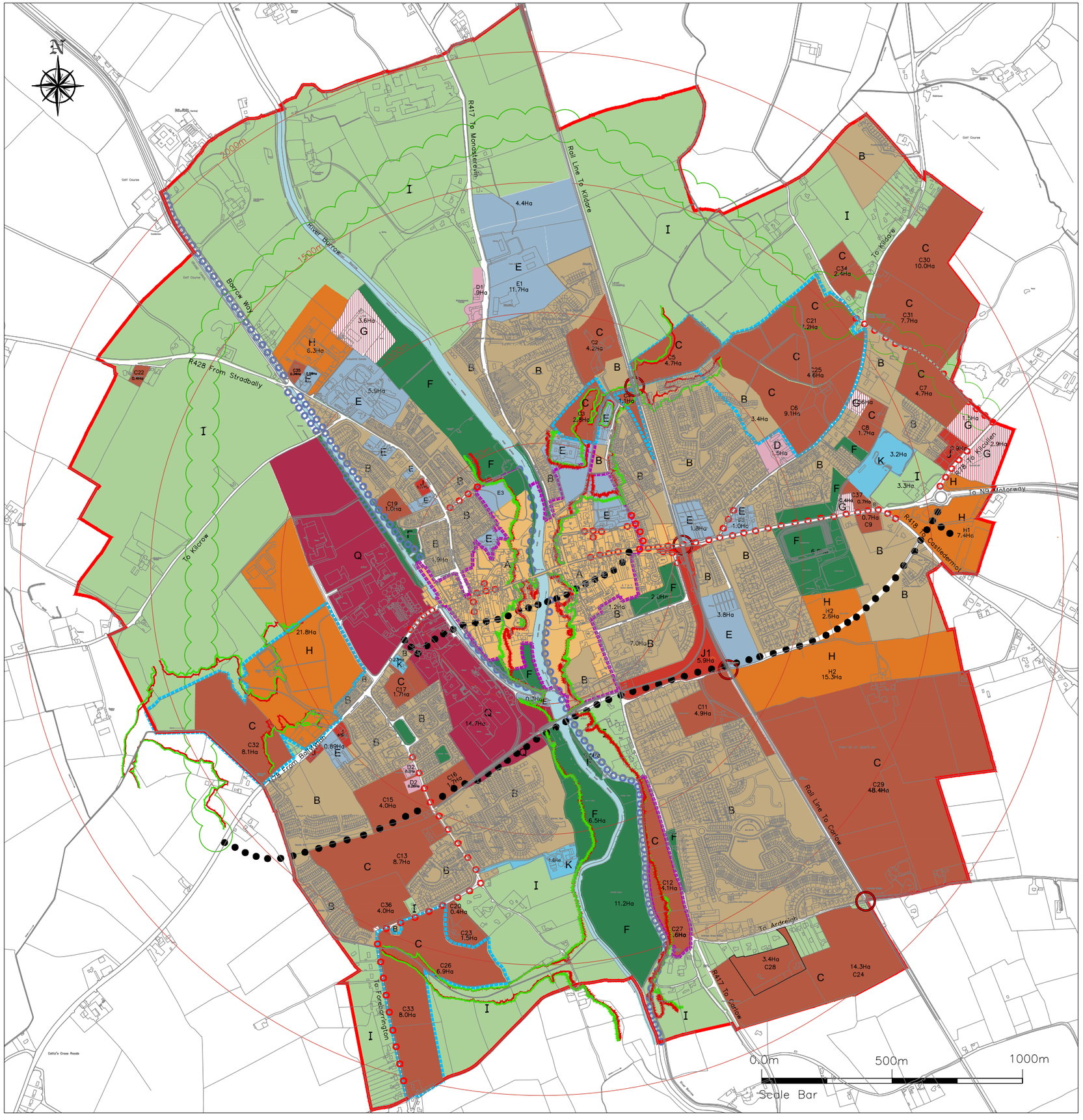
It is anticipated based on information available from the OPW that catchment-based Flood Planning Groups should be operational soon after adoption of the Athy Town Development Plan 2012~2018.

The catchment-based Flood Planning Groups will monitor and review progress in addressing flood risk in the County with reference to the "The Planning System and Flood Risk Management Guidelines", the EU Floods Directive and this Strategic Flood Risk Assessment together with other data sources as they become available.

It is recommended that the relevant statutory bodies and the catchment based Flood Planning Groups are consulted, and that their progress in implementation of the requirements of the EU Flood Directive is reviewed prior to the preparation of the next Athy Town Development Plan (i.e. the Plan which succeeds the 2012~2018 Plan).

APPENDIX 1

MAPS SHOWING AREAS FOR WHICH ADDITIONAL ASSESSMENT AND / OR APPLICATION OF THE JUSTIFICATION TEST WAS RECOMMENDED



Athy Town Council

Draft Athy Town Development Plan 2012-2018

LEGEND

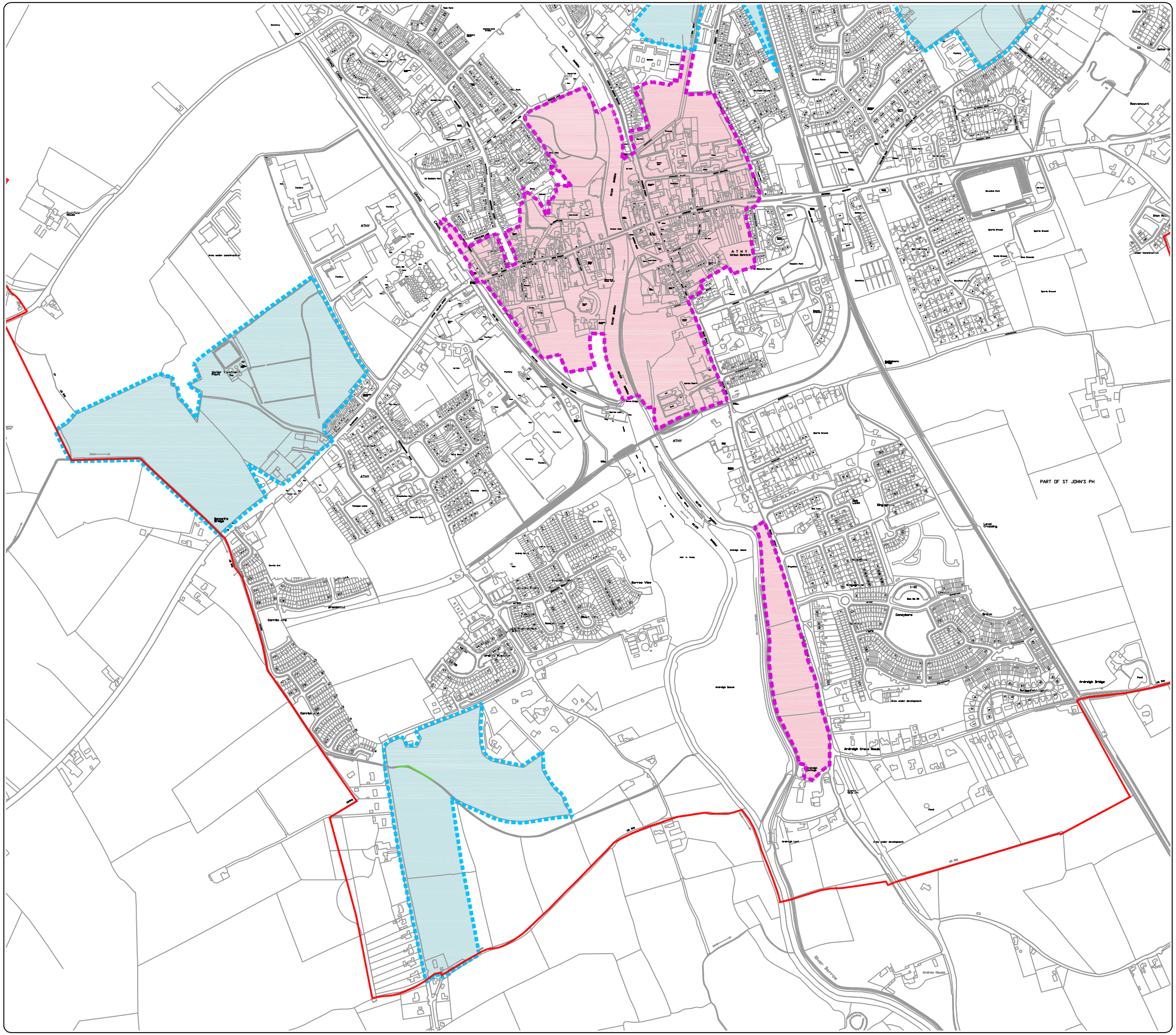
- A: Town Centre
- B: Existing Residential & Infill
- C: New Residential
- D: Neighbourhood Centre
- E: Community & Educational
- F: Open Space & Amenity
- G: Light Industrial & Commercial
- H: Industrial & Warehousing
- I: Agricultural
- J: Transport & Utilities
- K: Public Utilities
- Q: Enterprise & Employment
- Rivers and Canals
- Athy Town Council Boundary
- 500m Intervals from the centre of Town
- Public Rights of Way
- New Roads Objectives
- Northern Distributor Road Study Area
- Improvements to existing Road Network
- Reservation to allow upgrading of the Rail Bridge
- Strategic Flood Risk Assessment Category 2 — Areas where proposed land-use should be subject to the Justification Test
- Strategic Flood Risk Assessment Category 1 — Areas where additional assessment should be carried out prior to final land-use classification
- 100 Year Flood Line
- 1000 Year Flood Line

Note: Road, cycle and foot path locations are indicative only & may be subject to change during the detailed design process.

Land Use Zoning Objectives Map

Date: March 2011	Map Ref: 16.1
Scale: N.T.S.	Drawing No: 200/10/507
	Drawn By DMcN

THIS DRAWING TO BE READ IN CONJUNCTION WITH THE WRITTEN STATEMENT



NOTES A3

LEGEND

Category 1
Areas where additional assessment should be carried out prior to final land-use classification

Category 2
Areas where proposed land-use should be subject to the Justification Test

Town Council Boundary

N

REV	DATE	BY	DETAILS
D2	22/03/11	PB	Legend Modified

STATUS
PLANNING

CLIENT
ATHY TOWN COUNCIL

PROJECT
DRAFT STRATEGIC FLOOD RISK ASSESSMENT
ATHY TOWN DEVELOPMENT PLAN

TITLE
AREAS FOR WHICH ADDITIONAL ASSESSMENT AND/OR JUSTIFICATION TESTING IS RECOMMENDED (1 OF 2)

KILGALLEN & PARTNERS
CONSULTING ENGINEERS
KYLEKIPROE, WELL ROAD, PORTLAOISE, CO. LAOIS
Tel: +353 57 86 62860, Fax: +353 57 86 62861
E-mail: Info@Kilgallen.ie, Web: www.kilgallen.ie

DRN:	SCALE:	MAP No.	REV.:
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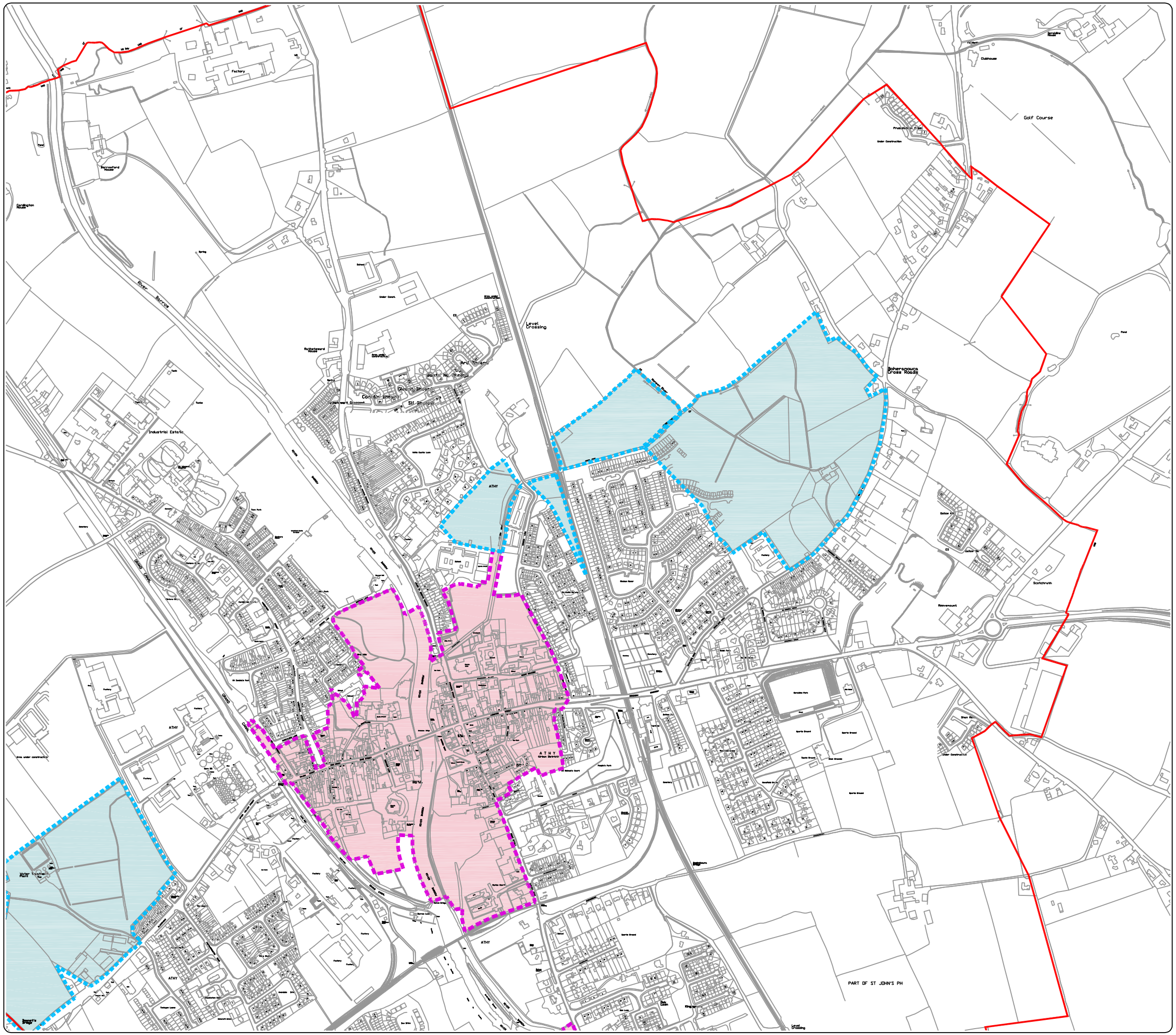
CHKD: MK	DATE: 07/01/11		


River Barrow
Level Crossing
Golf Course
Clubhouse
Factory
Industrial Estate
Grand Canal
ATHY
Athy Town Park
Athy Castle Lane
Queen's Bridge
Coursehall Crescent
St. Joseph's
Abbey Terrace
Abbey Street
Abbey Lane
Abbey Park
Abbey Court
Abbey Grove
Abbey Road
Abbey Gate
Abbey Mews
Abbey Close
Abbey Square
Abbey Manor
Abbey Meadows
Abbey Rise
Abbey Walk
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Abbey Drive
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Athy Garda Station
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APPENDIX 2

DESCRIPTION OF DETAILED FRA

MAPS SHOWING FLOOD LINES DELINEATING FLOOD ZONES A AND B THROUGH ASSESSMENT AREAS

SOURCE DATA

The data upon which the FRA is based has been obtained from a combination of desk studies and field measurement. This data is used in the estimation of the flood flows for the flood events under consideration and in the subsequent hydrological modelling from which the floodplain maps are derived.

DESK STUDY

The desk study was prepared using records made available by Environmental Protection Agency (EPA), Kildare County Council, Met Éireann, the Office of Public Works (OPW) and Ordnance Survey of Ireland (OSI).

Examination of OPW records shows that a hydrometric gauge exists on the River Barrow at Levitstown, approximately 7 km downstream of Athy town. The hydrometric gauge has recorded data since 1941 and thus has a substantial record of flood flows on the subject river.

No hydrometric gauges are in operation on the Ballyadams or Moneen Rivers.

Data from the OPW website http://www.floodmaps.ie shows records of repeated flooding in the following areas:

- Flood Id = 1551: River Barrow overflows its banks in February 1990 and flooded significant area along the R417 including the road. The R417 has been raised;
- Flood Id = 1552: "Clonmullin, Athy – River Moneen overflows its banks after intense rainfall during the summer of 1997. A number of properties have been flooded";
- Photographs provided of August 2008 flood of River Barrow through Athy;
- Photographs of flooding at Ardreigh – 19th November 1997;
- provided of August 2008 flood of River Barrow through Athy;
- Flood Id = 1560: Farmhill R417 – Localised hollow on the road is flooded every year after heavy rain. The water flows off the land. Natural drainage has been interfered with;
- Flood Id = 1561: Ardreigh R417 – Localised hollow on the road is flooded every year after heavy rain. The water flows off the land. Natural drainage has been interfered with;
- Flood Id = 1566: Gallowshill on R418 – Low lying land is flooded every year after heavy rain. Road is liable to flood. The water flows off the land. Development has exasperated the problem;
- Flood Id = 1567: Gallowshill – Low lying land is flooded every year after heavy rain. Road is liable to flood. The water flows off the land. Development has exasperated the problem;
- Flood Id = 1569: Gallowshill on N78 – Localised hollow on the road is flooded every year after heavy rain. The water flows off the land. Development has exasperated the problem. The council has undertaken remedial work and may be resolved.

Aerial photographs were also provided by Kildare County Council of the flooding in Athy on the 23rd November 2009.

The following is noted from the Met Éireann report "Report on Rainfall of November 2009"

"Rainfall totals for November were the highest on record at most stations, including the long-term station at Valentia Observatory, where records extend back over 100 years. Valentia's total of 360mm was its highest of any month since observations began in the area in 1866."

"More than twice the average November amounts were measured at almost all stations, and over three times the normal amount fell in some places. Rain or showers were recorded on almost every day, with between 17 and 30 wetdays were observed (days with 1mm or more rainfall), compared with the normal range for November of between 13 and 20 wetdays. Heavy precipitation days (daily rain of 10mm or more) were also well above normal. Heaviest daily falls at most stations were recorded on the 1st, in the period 16th to 19th, and on the 29th in the east; two-day falls of over 100mm were recorded in parts of the west and southwest on the 18th/19th."

The Met Éireann report also shows a 16 day total depth of rainfall at Athy of 166mm and a 25 day total rainfall of 209mm. These correspond to rainfall return periods of 200 and 278 years respectively.

The Ordnance Survey of Ireland provide both up-to-date and historical mapping of Athy. This can be useful to see any changes to river channels and areas liable to flooding.

ESTIMATION OF PEAK FLOOD FLOWS

The OPW hydrometric gauge at Levitstown on the River Barrow is located approximately 7km downstream of Athy. The data from the gauge has been used for purposes of this flood risk assessment on the River Barrow.

In accordance with the methodology described in the Flood Studies Report and in "*Flood Estimation following the Flood Studies Report* " by Cunnane & Lynn, the annual maxima data recorded at Levitstown hydrometric gauge was used to calculate the 1 in 100 year and 1 in 1,000 year flood flows. For information, a 1 in 100 year flood event is a flood event which has the probability of being equaled or exceeded once every 100 years. Alternatively it may be expressed as a flood event which has a 1% chance of occurring in any single year. The 1 in 1,000 year flood has a 0.1% chance of occurring in any single year. The effects of climate change were also taken into account by increasing the flood flows by 20%.

Using the methodology described above, the following are the flows which correspond to the 1 in 100 year and 1 in 1,000 year flood events respectively (inclusive of climate change):

River Barrow

1 in 100 year flood flow:	Q_{100}	=	226.0 m^3/s
1 in 1,000 year flood flow:	$Q_{1,000}$	=	284.0 m^3/s

For comparison purposes, the largest flood flow recorded on the River Barrow at Levitstown since records began was in November 2009 when a flow of 180 m^3/s was registered.

For the Ballyadams and Moneen Rivers, no hydrometric data was available. Therefore, the Flood Studies Report was used and the following flood flows (inclusive of climate change) were calculated:

Ballyadams River:

1 in 100 year flood flow:	Q_{100}	=	19.18 m^3/s
1 in 1,000 year flood flow:	$Q_{1,000}$	=	25.45 m^3/s

Moneen River:

1 in 100 year flood flow:	Q_{100}	=	31.30 m^3/s
1 in 1,000 year flood flow:	$Q_{1,000}$	=	41.52 m^3/s

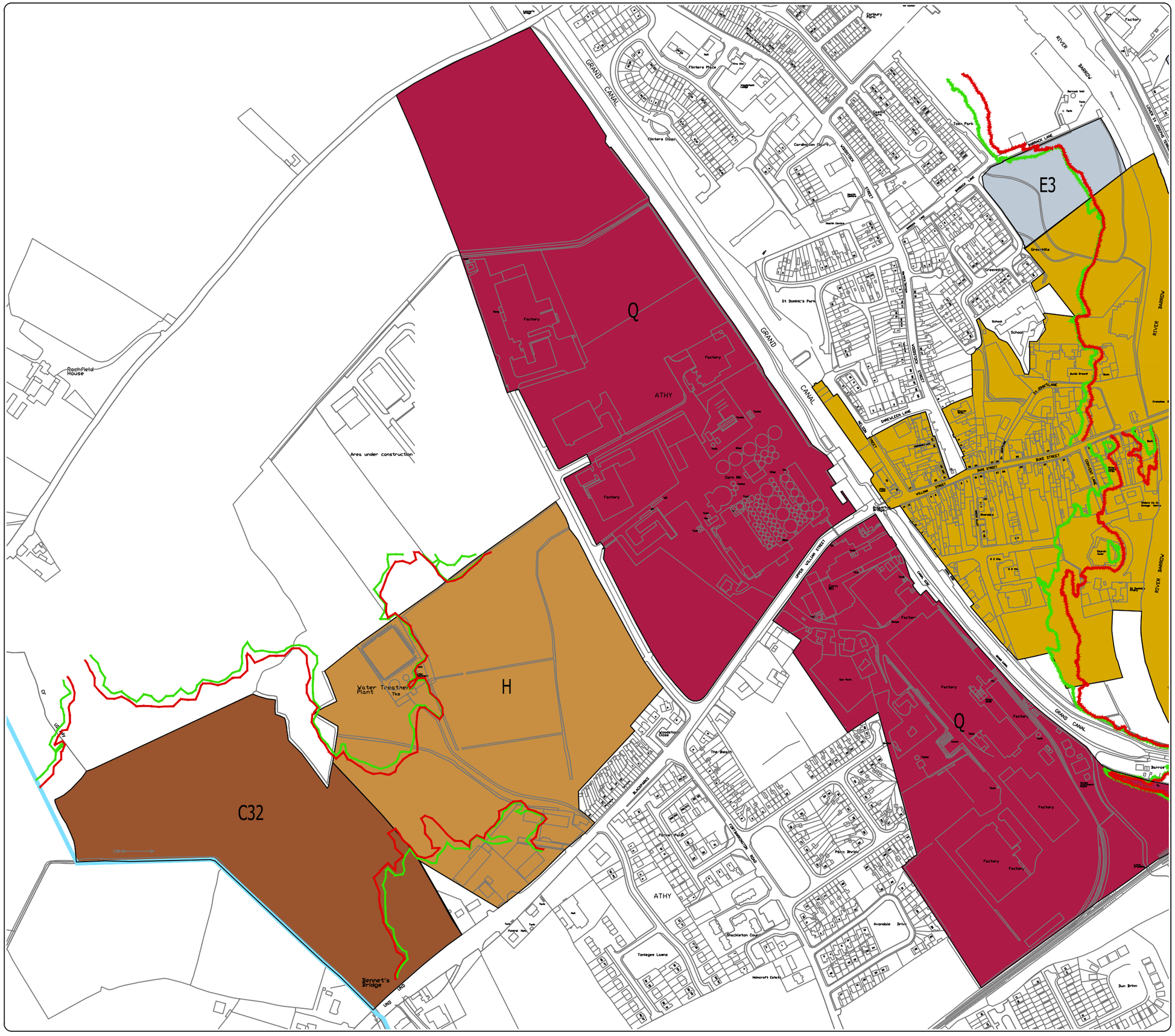
HYDROLOGICAL MODELS OF THE RIVER

In order to assess the impact of these peak flood flows on the subject areas, a hydrological model which simulates the flow patterns during design flood events was developed using the RiverCAD software modelling package. RiverCAD software amalgamates the industry standard software packages HEC-RAS (US Army Corps of Engineers) and AutoCAD (Autodesk). The data input into the program consisted of the following:

- Cross-sectional data for the river channel and bridges as surveyed on site by Kilgallen & Partners staff;
- LiDAR survey of the surrounding lands as provided by Ordnance Survey of Ireland;
- Appropriate values for Manning's "n" as determined from visual inspection of the site;
- Peak flows for the 100 year and 1,000 year flood events.

As November 2009 is credited with the largest flow of 180 m^3/s on the River Barrow at Levitstown since records began and as a detailed set of aerial photographs were available from Kildare County Council, this flood was used to calibrate the model.

Using this model, floodplain maps were prepared for the 100 year and 1,000 year flood events. Drg. No.'s 033-DAR2-FL1 to FL4 show the resulting flood-lines which delineate the 100year and 100year flood plains (Flood Zones A and B respectively).



NOTES A3

LEGEND

100YEAR FLOOD LINE

1000YEAR FLOOD LINE

TOWN COUNCIL BOUNDARY

N

REV	DATE	BY	DETAILS

STATUS
PLANNING

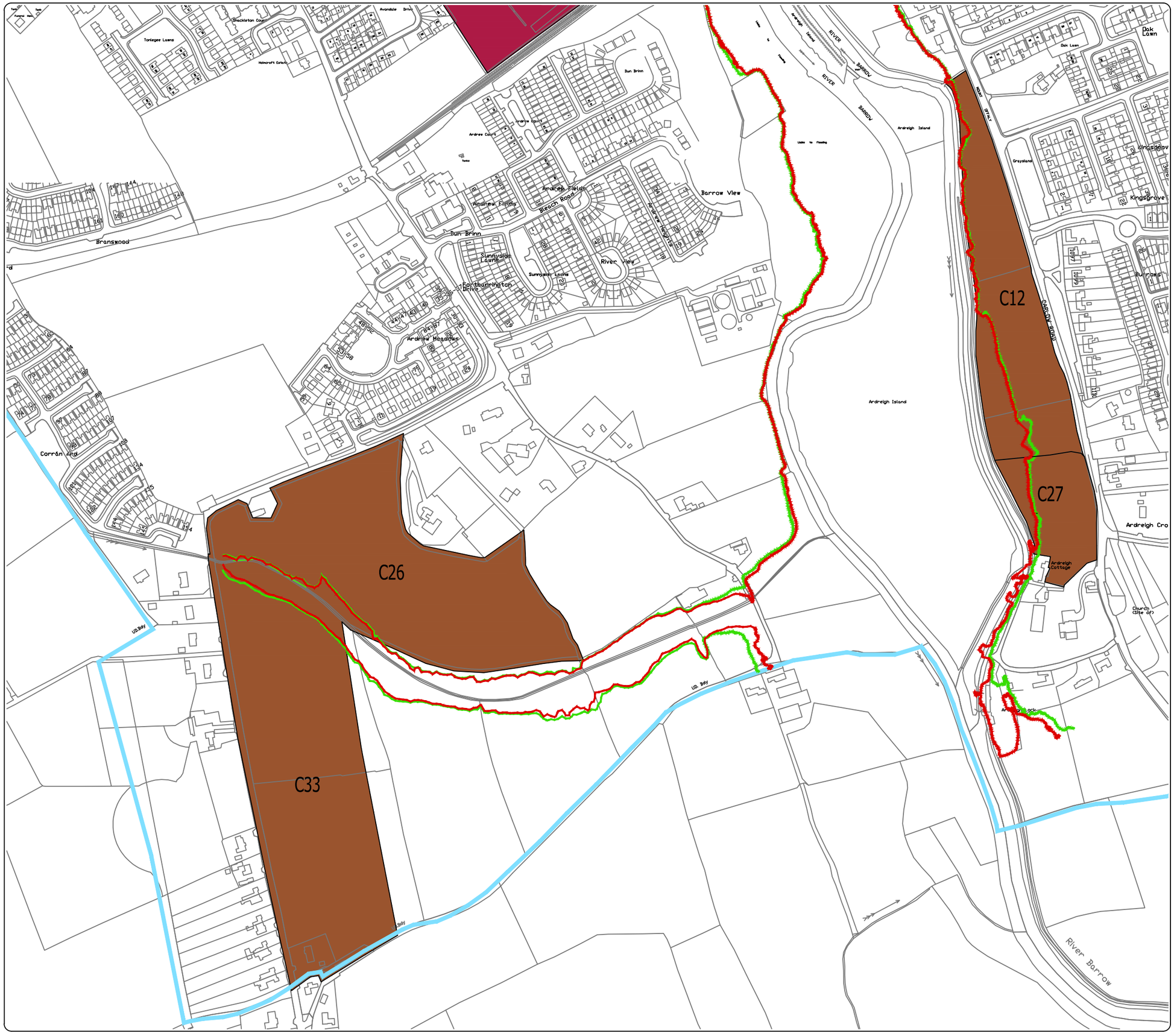
CLIENT
ATHY TOWN COUNCIL

PROJECT
DRAFT STRATEGIC FLOOD RISK ASSESSMENT
ATHY TOWN DEVELOPMENT PLAN

TITLE
FLOOD LINES AT WOODSTOCK SOUTH, BALLYLYNAN ROAD

KILGALLEN & PARTNERS
CONSULTING ENGINEERS
KYLEKIPROE, WELL ROAD, PORTLAOISE, CO. LAOIS
Tel: +353 57 86 62860, Fax: +353 57 86 62861
E-mail: Info@Kilgallen.ie, Web: www.kilgallen.ie

DRN: PB	SCALE: 1:5,000@A3	MAP No. 033-DAR2-FL1	REV.: D1
CHKD: MK	DATE: 09/03/11		



NOTES A3

LEGEND

100YEAR FLOOD LINE

1000YEAR FLOOD LINE

TOWN COUNCIL BOUNDARY

N

REV	DATE	BY	DETAILS

STATUS
PLANNING

CLIENT
ATHY TOWN COUNCIL

PROJECT
DRAFT STRATEGIC FLOOD RISK ASSESSMENT
ATHY TOWN DEVELOPMENT PLAN

TITLE
FLOOD LINES EAST AND WEST OF
ARDREIGH ISLAND

KILGALLEN & PARTNERS
CONSULTING ENGINEERS
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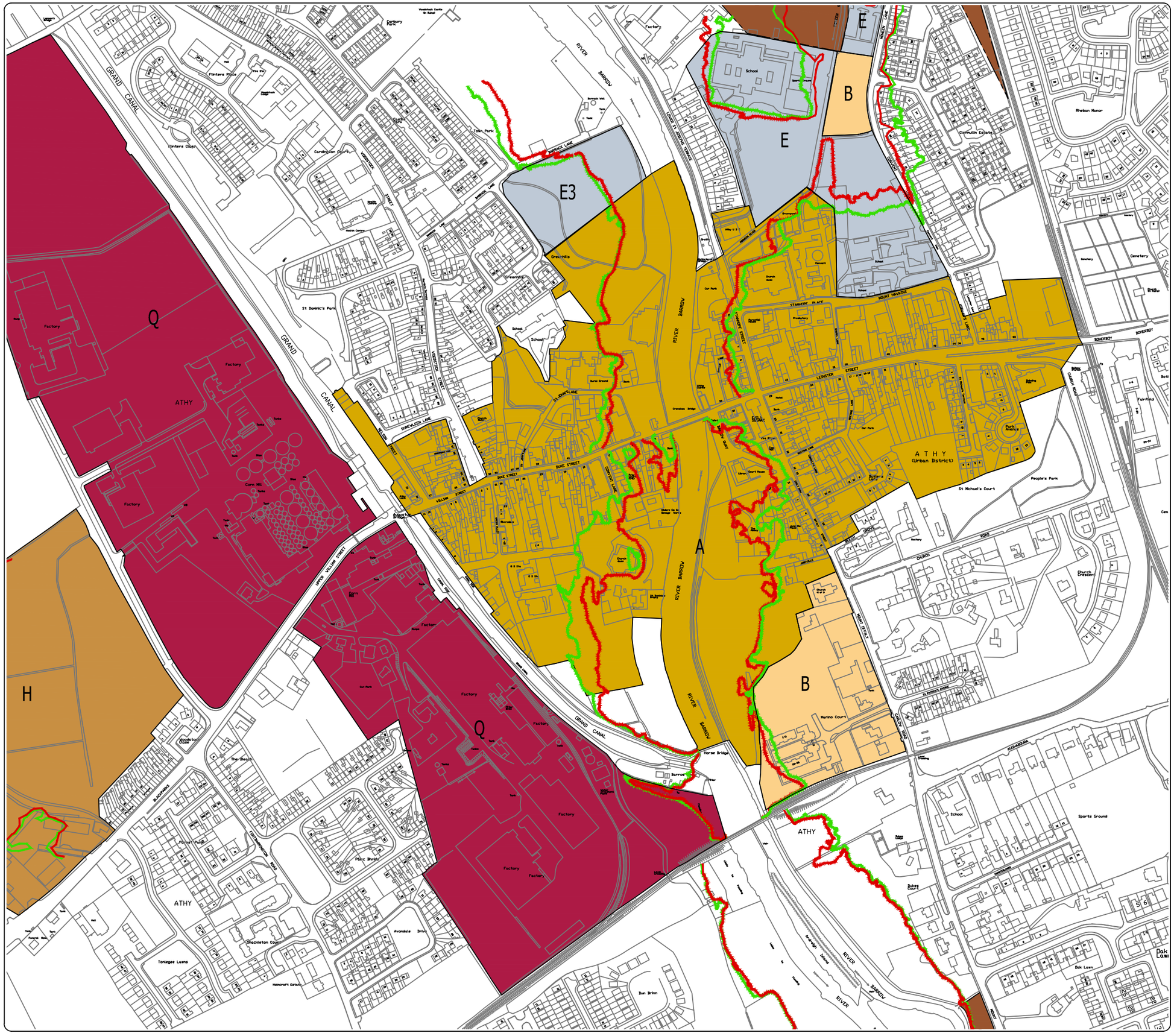
DRN:	SCALE:	MAP No.	REV.:
PB	1:5,000@A3	033-DAR2-FL2	D1
CHKD: MK	DATE: 09/03/11		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RIVER BARROW
GRAND CANAL
ATHY
A T H Y
(Urban District)
School
Cemetery
Factory
Sports Ground
Church
Graveyard
Health Centre
Town Park
Barrack Lane
Leinster Street
Duke Street
Stanhope Street
Emily Square
Offaly Street
Upper Williams Street
Shrewsbury Lane
Dublin Road
Church Road
Rheban Manor
Clonmullin Estate
Fairfield
Park Avenue
People's Park
St Michael's Court
Marina Court
Sports Ground
Dak Lawn
Avondale Drive
Tonlegee Lawns
Shackleton Court
Homecroft Estate
Kilkea Castle Road
Upper Williams Street
Grand Canal
Horse Bridge
Barrack
Weir
Lock
Factory
Factory Yard
Corn Mill
Tanks
Silos
Kiln
Yard
Store
Shed
Pump House
Transformer
Gas Governor
Bridge
Ruins
Graveyard
Church Hall
Presbytery
Convent
Our Lady's Grotto
Holy Water Font
Graveyard Cross
Stone Cross
Grave Slab
Tomb
Burial Ground
Graveyard
Cemetery
Sports Ground
Sports Pavilion
Tennis Court
Basketball Court
Playground
Pitch
Track
Allotments
Public Toilets
Bus Shelter
Bus Stop
Car Park
Petrol Station
Garage
Shop
Hotel
Pub
Restaurant
Bank
Post Office
Library
Museum
Theatre
Cinema
Nursing Home
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Clinic
Dispensary
Fire Station
Police Station
Garda Station
Courthouse
Prison
Barracks
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Airfield
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Chimney
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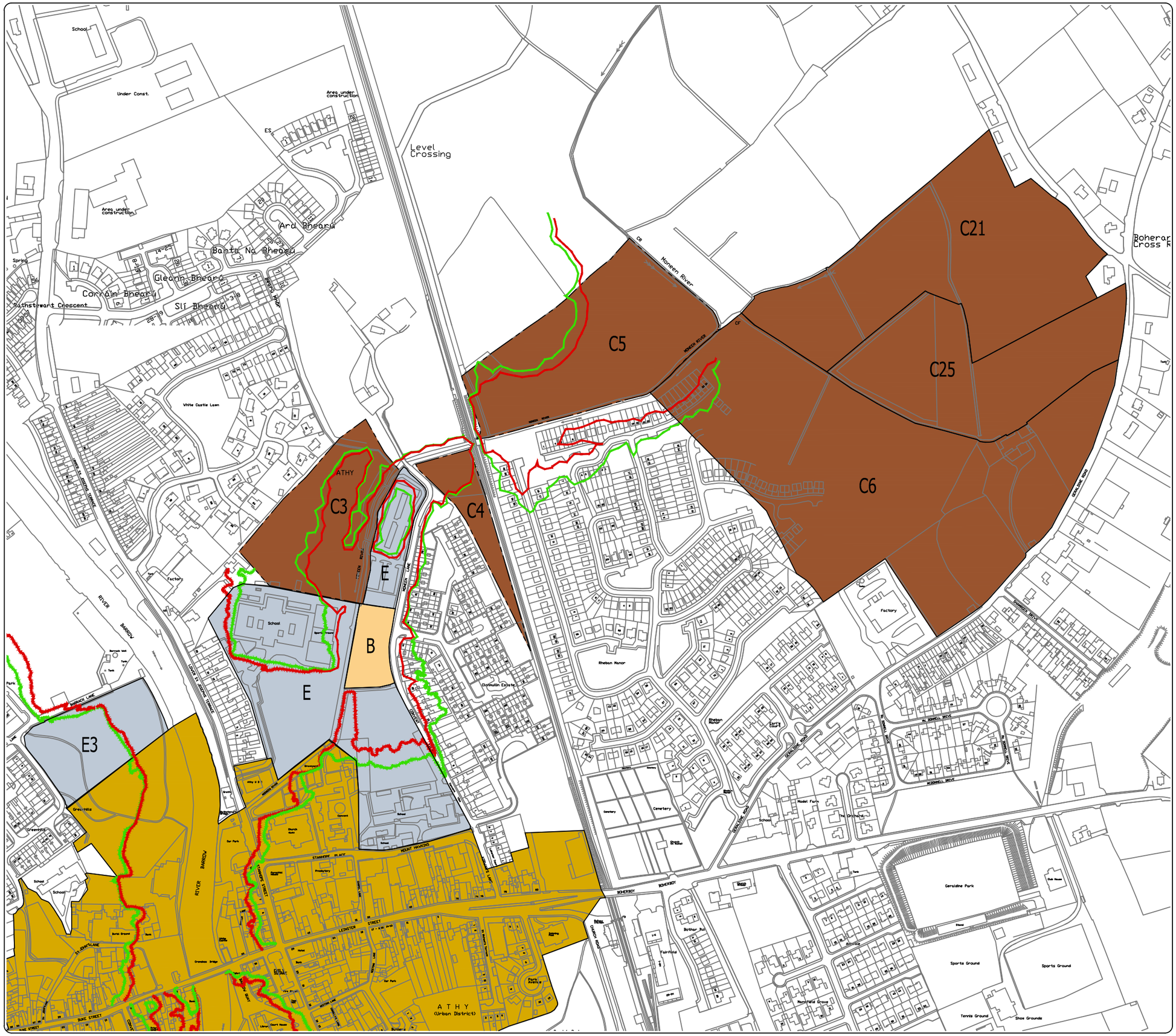
Hydrant
Meter
Sluice
Weir
Dam
Reservoir
Water Tank
Water Tower
Well
Spring
Culvert
Ford
Footbridge
Viaduct
Tunnel
Cutting
Embankment
Quarry
Pit
Spoil Heap
Landfill
Recycling Centre
Bottle Bank
Civic Amenity Site
Abattoir
Creamery
Dairy
Mill
Maltings
Brewery
Distillery
Warehouse
Cold Store
Grain Store
Slurry Tank
Silage Pit
Manure Heap
Farmyard
Milking Parlour
Cattle Shed
Pig Sty
Poultry House
Stable
Kennel
Aviary
Apiary
Orchard
Vineyard
Nursery
Greenhouse
Polytunnel
Shelterbelt
Hedgerow
Wall
Fence
Gate
Stile
Cattle Grid
Boundary Post
Milestone
Signpost
Information Board
Litter Bin
Bench
Picnic Table
Shelter
Toilet
Changing Room
Shower
Lifeguard Station
Boat Ramp
Jetty
Pier
Harbour
Marina
Slipway
Mooring
Buoy
Navigation Light
Beacon
Lighthouse
Fog Signal
Radio Mast
Satellite Dish
Weather Station
Rain Gauge
Anemometer
Wind Vane
Thermometer
Barometer
Hygrometer
Sunshine Recorder
Evaporation Pan
Soil Moisture Probe
Groundwater Monitoring Well
Piezometer
Tide Gauge
Wave Buoy
Current Meter
Salinity Probe
Water Quality Sampler
Automatic Weather Station
Flood Warning Siding
Flood Gate
Flood Barrier
Sandbag Store
Emergency Shelter
Assembly Point
Helipad
Rescue Boat
Lifeboat
Coastguard Station
Search and Rescue
Medical Post
Ambulance
Fire Engine
Police Car
Garda Car
Army Vehicle
Helicopter
Aeroplane
Glider
Hot Air Balloon
Parachute
Kite
Drone
Satellite
Space Station
Rocket
Missile
Bomb
Mine
Grenade
Gun
Rifle
Pistol
Sword
Shield
Armour
Helmet
Uniform
Flag
Banner
Pennant
Standard
Drum
Trumpet
Bugle
Whistle
Bell
Gong
Cymbal
Tambourine
Guitar
Violin
Piano
Organ
Harp
Flute
Clarinet
Saxophone
Trombone
Tuba
Accordion
Harmonica
Microphone
Loudspeaker
Amplifier
Mixing Desk
Recording Studio
Radio Station
Television Station
Newspaper Office
Printing Press
Publishing House
Bookshop
Library
Museum
Art Gallery
Theatre
Cinema
Concert Hall
Opera House
Ballet
Dance Hall
Nightclub
Casino
Bingo Hall
Amusement Arcade
Funfair
Theme Park
Zoo
Aquarium
Safari Park
Wildlife Park
Nature Reserve
National Park
World Heritage Site
Archaeological Site
Ancient Monument
Historic Building
Castle
Abbey
Priory
Monastery
Convent
Church
Cathedral
Basilica
Chapel
Oratory
Shrine
Holy Well
Graveyard
Cemetery
Crematorium
Mausoleum
Tomb
Grave
Headstone
Memorial
Statue
Obelisk
Cross
Celtic Cross
Round Tower
Ogham Stone
Standing Stone
Stone Circle
Dolmen
Cairn
Barrow
Ring Fort
Crannog
Souterrain
Megalithic Tomb
Passage Tomb
Wedge Tomb
Court Tomb
Portal Tomb
Gallery Grave
Boulder Burial
Cist
Urn
Cremation
Inhumation
Excavation
Trench
Test Pit
Auger Hole
Core Sample
Geophysical Survey
Magnetometer
Resistivity
Ground Penetrating Radar
Aerial Photography
Lidar
Photogrammetry
Survey Point
Benchmark
Trig Point
Control Point
GPS Station
Total Station
Theodolite
Level
Staff
Tape Measure
Chain
Plumb Bob
Compass
Clinometer
Inclinometer
Extensometer
Strain Gauge
Load Cell
Pressure Transducer
Data Logger
Telemetry
Modem
Router
Server
Computer
Monitor
Keyboard
Mouse
Printer
Plotter
Scanner
Camera
Video Camera
Webcam
CCTV
Alarm
Siren
Flashing Light
Traffic Light
Pedestrian Crossing
Zebra Crossing
Pelican Crossing
Puffin Crossing
Toucan Crossing
Cycle Lane
Bus Lane
Tram Line
Railway Line
Level Crossing
Station
Platform
Signal
Point
Buffer
Turntable
Depot
Workshop
Shed
Yard
Siding
Loop
Junction
Overpass
Underpass
Flyover
Interchange
Roundabout
Slip Road
Motorway
Dual Carriageway
Single Carriageway
Track
Path
Footpath
Bridleway
Cycleway
Greenway
Towpath
Canal
River
Stream
Ditch
Drain
Culvert
Weir
Lock
Sluice
Dam
Reservoir
Lake
Pond
Wetland
Bog
Marsh
Fen
Swamp
Mudflat
Saltmarsh
Beach
Dune
Cliff
Headland
Island
Peninsula
Bay
Estuary
Delta
Waterfall
Rapids
Spring
Well
Aquifer
Groundwater
Surface Water
Catchment
Watershed
Flood Plain
Flood Zone
Flood Defence
Embankment
Revetment
Gabion
Rip Rap
Groyne
Breakwater
Seawall
Promenade
Esplanade
Coastal Path
Dune Grass
Marram Grass
Sand
Shingle
Pebbles
Rock
Boulder
Cobble
Gravel
Silt
Clay
Peat
Topsoil
Subsoil
Bedrock
Outcrop
Scree
Talus
Landslip
Subsidence
Erosion
Deposition
Sediment
Suspended Solids
Turbidity
Water Quality
Pollution
Contamination
Remediation
Waste
Hazardous Waste
Clinical Waste
Radioactive Waste
Recycling
Composting
Anaerobic Digestion
Biogas
Landfill Gas
Leachate
Capping
Restoration
Aftercare
Monitoring
Inspection
Maintenance
Repair
Replacement
Upgrade
Decommissioning
Demolition
Construction
Excavation
Earthworks
Piling
Concrete
Steel
Timber
Brick
Stone
Tarmac
Asphalt
Paving
Kerb
Channel
Gully
Grating
Manhole Cover
Road Marking
Traffic Sign
Speed Limit
Weight Limit
Height Restriction
Width Restriction
No Entry
One Way
Give Way
Stop
Yield
Roundabout
Mini Roundabout
Traffic Island
Central Reservation
Hard Shoulder
Emergency Lane
Toll Booth
Toll Plaza
Weighbridge
Rest Area
Service Station
Motel
Hostel
Campsite
Caravan Park
Holiday Home
Second Home
Vacant Property
Derelict Property
Boarded Up
Graffiti
Vandalism
Litter
Fly Tipping
Abandoned Vehicle
Scrap Yard
Car Park
Multi-Storey Car Park
Underground Car Park
Park and Ride
Bus Station
Train Station
Ferry Terminal
Airport
Heliport
Marina
Boatyard


C21
C5
C25
C6
C3
C4
E
B
E
E3
Level Crossing
Ard Bhearú
Banta Na Bheary
Gleann Bhearú
Corrán Bhearú
Sli Bhearú
Moreen River
ATHY
A T H Y
(Urban District)
RIVER BARROW
Rheban Manor
Cloonullin Estate
Geraldine Park
Sports Ground
Tennis Ground
Cemetery
Factory
School
Church
Model Farm
Fairfield
Nursefield Grove
Shore Grounds
Oak House
Bohercross
Woodstock Drive
Geraldine Road
McDonnell Drive
Mount Hawkins
Stanhope Place
Stanhope Street
Leinster Street
Duke Street
Barrack Lane
Church Lane
Emmet Street
Bohermoy
Green Hills
White Castle Lawn
Rathstewart Crescent
Area under construction
Under Const.
Spring
Park
Tank
Graveyard
Convent
Presbytery
Bowling Green
Bank
Hotel
Court House
Library
Garda Station
Public Toilets
Car Park
Playing Fields
Pitch
Tennis Court
Sluice
Weir
Bridge
Crossbow Bridge
Level Crossing Gates
Boundary Stones
Ruins
Burial Ground
Cemetery
Graveyard
Church Ruins
Old Mill
Mill Race
Sluice Gate

APPENDIX 3

RECORDS OF JUSTIFICATION TESTS WHERE LAND-USE PROPOSALS PASSED THE TEST

JUSTIFICATION TEST

	CRITERIA	RESPONSE.
A	The urban settlement is targeted for growth under the NSS, RPGs, statutory plans as defined or under the Planning Guidelines or Planning Directives provisions of the Planning and development Act 2000, as amended.	Athy is the largest town in south Kildare and the sixth largest in County Kildare. It is identified as a Moderate Sustainable Growth town in the RPGs and as a Secondary Economic Growth Centre in the GDA. Arising from the RPGs and the Draft County Development Plan 2011-2017, a growth target of 10,679 population / 1,252 units is prescribed for Athy between 2006-2017. These figures have been extrapolated forward to cover the period of the Athy Development Plan 2012-2018 demonstrating a population increase of 10,819 and a unit target of 2,876.
B	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:	A key principle of the core strategy is to promote Athy town centre as a vibrant centre offering a wide range of services and opportunities within a high quality urban environment. Consolidation of the existing town centre, utilization of backlands and appropriate development of brownfield sites is of primary importance. The plan seeks to develop a compact urban form which will facilitate the efficient use and re-use of land, as well as the efficient use of existing infrastructure. The development of the town centre area is necessary as it discourages urban sprawl at lower densities which consumes greenfield sites on the edge of the urban area, is expensive to develop due to infrastructure costs and is located away from existing communities and existing infrastructure.
C	(i) Is essential to facilitate regeneration and / or expansion of the centre of the urban settlement;	There are a number of areas within and close to the town centre which are considered suitable for regeneration and expansion of the town centre functions. Opportunities exist particularly for the Dominican Lands, Edmund Rice Square, the Abbey Site and along Leinster Street including Emily Square. The proposed zoning is considered necessary to facilitate the future sustainable regeneration and / or expansion of the centre of Athy.

JUSTIFICATION TEST

	CRITERIA	RESPONSE.
D	(ii) Comprises significant previously developed and / or under utilized lands;	A considerable number of vacant premises, derelict buildings, backland areas, infill and brownfield sites exist within the town centre area.
E	(iii) Is within or adjoining the core of an established or designated urban settlement;	The sites are located within the core area which acts as a centre for a broad range of employment, retail, commercial, residential and transport functions.
F	(iv) Will be essential in achieving compact and sustainable urban growth; and	Rejuvenation of the town centre and expansion is considered necessary to deliver a compact urban environment. This will improve quality of life, reduce travel demand, optimise the use of infrastructure and lessen negative social and environmental costs.
G	(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.	Athy has developed as part of the Angle-Norman settlement in Ireland developing from a relatively compact urban form. The location of the town centre has thus been long established and relocation of town centre uses to the periphery of the town would not be in accordance with the proper planning and sustainable development of the area.
H	SFRA must demonstrate 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.	The lands are not entirely covered by Flood Zones A & B. Access to the public road from these lands can be achieved outside of these Flood Zones. The elevation of finished ground floor, road and parking areas can be designed to be above the Flood Level for the 1000year flood. Appropriate design and layout of for development proposals will allow the incorporation of mitigation measures which will esnure that: (i) there is no net reduction in the volume of floodplain storage contained within the lands being developed; (ii) existing flow paths for flood waters will not be compromised.

JUSTIFICATION TEST

	CRITERIA	RESPONSE.
A	The urban settlement is targeted for growth under the NSS, RPGs, statutory plans as defined or under the Planning Guidelines or Planning Directives provisions of the Planning and development Act 2000, as amended.	Athy is the largest town in south Kildare and the sixth largest in County Kildare. It is identified as a Moderate Sustainable Growth town in the RPGs and as a Secondary Economic Growth Centre in the GDA. Arising from the RPGs and the Draft County Development Plan 2011-2017, a growth target of 10,679 population / 1,252 units is prescribed for Athy between 2006-2017. These figures have been extrapolated forward to cover the period of the Athy Development Plan 2012-2018 demonstrating a population increase of 10,819 and a unit target of 2,876.
B	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:	The Draft Development Plan 2012-2018 zones approximately 33ha within the town boundary as Community and Educational lands. This site has: a) a long standing established educational use located in close proximity to the town centre area and to existing residential areas which is conducive to a sustainable and compact pattern of urban development. b) An established nursing home use is also located adjoining established residential uses. The site is also largely developed.
C	(i) Is essential to facilitate regeneration and / or expansion of the centre of the urban settlement;	The site located adjoining or in close proximity to the town centre area providing essential services to the residents of the town centre and the wider area within the town. The promotion and encouragement of a variety of uses, including educational and community uses, in and around the town centre leads to the creation of the most sustainable pattern of urban development. In light of sustainability principles the continued use of these site are appropriate.

JUSTIFICATION TEST

	CRITERIA	RESPONSE.
D	(ii) Comprises significant previously developed and / or under utilized lands;	The lands comprise largely developed sites. Much of the flood risk area associated with the schools is in use as playing pitches / open space ancillary to the school.
E	(iii) Is within or adjoining the core of an established or designated urban settlement;	The sites are located within 500m of the centre of Athy, which is characterised by commercial, residential and town centre uses.
F	(iv) Will be essential in achieving compact and sustainable urban growth; and	Given the location of the sites in proximity to the core area and within an established residential area, the development of this area is considered essential in achieving compact and sustainable urban growth.
G	(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 is an established educational and nursing home use at this location. Much of the area located within the flood risk zone associated with the educational use forms playing pitches/open space associated with the school.
H	SFRA must demonstrate 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.	The lands are not entirely covered by Flood Zones A & B. Access to the public road from these lands can be achieved outside of these Flood Zones. The elevation of finished ground floor, road and parking areas can be designed to be above the Flood Level for the 1000year flood. Appropriate design and layout of for development proposals will allow the incorporation of mitigation measures which will esnure that: (i) there is no net reduction in the volume of floodplain storage contained within the lands being developed; (ii) existing flow paths for flood waters will not be compromised.