



Evidence Base

City of York

LDF

Local
Development
Framework

Strategic Flood Risk Assessment Appendices

June 2007

APPENDICES

Appendix 1: Sources of Information

General Sources

River Flood Emergency Plan (September 2005) – City of York Council

River Ouse Catchment

Ouse Flood Risk Management Strategy (Preferred Strategy) – November 2005, Environment Agency

Section 105 Study: Burdyke (Phase 2: Detailed) - 2003, Atkins

Holgate Beck / Chaloner's Whin (Phase 1: Outline) - 2003, Atkins

Blue Beck (Phase 1: Outline), - 2001, Atkins

River Foss Catchment

River Foss Flood Alleviation Study – June 1983, YWA Rivers Division

Foss Navigation and the Effects on its Hinterland – 2000, Tessa Mitchell

The River Foss, Its History and Natural History – 1973, Michael Fife

Tang Hall Beck and Osbaldwick Beck Floodplain Mapping Study (Phase 2) – March 2004, JBA Consulting for EA

River Foss Floodplain Mapping Study (Phase 2) – March 2004, JBA Consulting for EA

River Foss (Phase 2: Detailed), - 2003, Atkins

Haxby Beck (Phase 1: Outline), - 2001, Atkins

Tang Hall Beck (Phase 1: Outline), 2003, Atkins

Osbaldwick Beck (Phase 1: Outline), 2003, Atkins

River Derwent Catchment

Derwent Catchment Flood Management Plan, Pilot Study Scoping Report – July 2001, Babbie Brown & Root.

River Derwent Catchment Flood Defence Improvement Strategy – May 2001, Babbie Group

Elvington Beck (Phase 1: Outline), 2001, JBA

Appendix 2: Consultees

External Consultees

Environment Agency

Acaster Internal Drainage Board

Appleton Roebuck and Copmanthorpe Internal Drainage Board

Foss Internal Drainage Board

Kyle and Upper Ouse Internal Drainage Board

Ouse and Derwent Internal Drainage Board

Marston Moor Internal Drainage Board

Appendix 3: EA High Level Target 12 Development & Flood Risk

“Much of the misery, loss and damage seen in recent floods could have been avoided if homes, offices and factories had been designed and located to reduce the risk of damage from flooding.

The Town & Country Planning system provides a mechanism for steering development away from flood risk areas, taking into account the statutory guidance in Planning Policy Guidance Note 25, *Development and Flood Risk* (now PPS25), and the technical advice of the Environment Agency.

The Environment Agency may be consulted by Local Planning Authorities (LPAs) on proposals for development in the floodplain and responds by giving technical advice and sometimes by recommending that planning consent should be refused outright on flooding grounds. Or we may recommend that it should be refused until the implications for flooding have been properly assessed.

The Environment Agency compiles an annual retrospective assessment of the impact of its advice on the development decisions of English LPAs. This is by the High Level Target 12 (HLT12) report. The primary aim of this report is to monitor the impact of the Environment Agency's advice on the development decisions of English LPAs.

The report concentrates on plans, and planning applications, where the Agency sustained its objections through to a known decision of the LPA. It also contains summary data on the total number of applications objected to by the Agency on flood risk grounds.

The Environment Agency also makes available to the public, at an early stage, information on planning applications to which we have objected on flooding grounds. This allows the public and other interested parties to be aware of major developments, where there is a flood risk, and allows them to make their views known to influence Local Planning Authorities before a decision is made.

EA reports are issued monthly and cover 'major' developments, i.e. residential development greater than 10 dwellings or with a site larger than 0.5 hectare and all other developments larger than 1 hectare. The objections will relate to developments either at risk of flooding (from fluvial, tidal or local land drainage sources) or likely to increase flood risk elsewhere. These developments are likely to be within the floodplain*, but may be outside it where our objection is because surface water run off from the development could increase flood risk to others. The objections to these applications may be withdrawn in the future if appropriate information is provided to the Environment Agency.”

* Floodplain is defined as the high-risk zone under PPS25 (England) and Technical Advice Note 15 (Wales), i.e. areas with an annual probability of flooding of 1% (1 in 100 years) fluvial and 0.5% tidal/coastal or greater.

Appendix 4: CITY OF YORK COUNCIL POLICY STATEMENT ON FLOOD

AND COASTAL DEFENCE

1. INTRODUCTION

Purpose

- 1.1 This policy statement has been prepared by City of York Council to provide a public statement of the Council's approach to flood defence in its area.

Background

- 1.2 The Ministry of Agriculture, Fisheries and Food has policy responsibility for flood and coastal defence in England. However, delivery is the responsibility of a number of flood and coastal defence "operating authorities" i.e. the Environment Agency, Local Authorities and Internal Drainage Boards. Responsibilities differ according to the type of operating authority and City of York Council's responsibilities are set out in paragraphs 3.1 and 3.2 below.
- 1.3 The Government has published a policy aim and three objectives for flood and coastal defence (ref 1). To ensure a more certain delivery of the aim and objectives by the individual operating authorities the Government has published a series of high-level targets (ref 2). The first target requires each operating authority to publish a policy statement setting out their plans for delivering the Government's policy aim and objectives in their area. This will include their assessment of flooding and erosion risk in their area, and the plans for reducing or managing that risk.
- 1.4 This policy statement fulfils that requirement. Copies are also available from the Council's offices at 9, St Leonard's Place, York, YO1 2ET and on the Internet at www.york.gov.uk.

We are also providing a copy to:

The Ministry of Agriculture, Fisheries and Food;
The Department of the Environment, Transport and the Regions
The Environment Agency
The following Internal Drainage Boards

Acaster
Appleton Roebuck and Copmanthorpe
Foss
Kyle and Upper Ouse
Marston Moor
Ouse and Derwent

2. HOW THE COUNCIL WILL DELIVER THE GOVERNMENT'S POLICY AIM AND OBJECTIVES

- 2.1 City of York Council acknowledges and supports the Government's aim and objectives for flood and coastal defence (as set out below). Our policy and approach will be consistent with them, as follows:

Government's policy aim: To reduce the risk to people and the developed and natural environment from flooding and coastal erosion by encouraging the provision of technically, environmentally and economically sound and sustainable defence measures.

Section 3 below sets out our plans for reducing or managing the risk of flooding in the Council's area.

Objective (a): To encourage the provision of adequate and cost effective flood warning systems.

Provision of flood warning systems is the responsibility of the Environment Agency. However, City of York Council recognises its related and important role in emergency planning and response. We will therefore:

- Ensure that our emergency response plans include appropriate arrangements for flooding emergencies and that such plans are reviewed, in consultation with the Environment Agency, at least every two years;
- Maintain an awareness of the Environment Agency's flood warning dissemination plan for our area and contribute to its implementation as necessary; and
- Play an agreed role in any flood warning emergency exercises organised by the Environment Agency covering our area.

Objective (b): To encourage the provision of adequate, economically, technically and environmentally sound and sustainable flood and coastal defence measures.

City of York Council will provide an adequate, economically, technically and environmentally sound approach to providing the flood defence service.

We will:

- Adopt a strategic approach to provision of flood defences, particularly by assessing any potentially wider effects of proposed defences. To this end we will continue to play a full role in Local Environment Agency Plans for our area;
- Aim to provide sustainable flood defences which provide social and/or economic benefits to people whilst taking account of natural processes and which avoid committing future generations to inappropriate defence options;
- Ensure work is carried out in accordance with best practice and to deliver best value for money including
 - (a) keeping up-to-date with policy and technical developments in flood defence, in particular by reference to MAFF guidance, other Government publications and relevant technical manuals;
 - (b) consulting the Environment Agency on flood defence options to ensure that best practice is adopted and shared; and
 - (c) using appropriately qualified experts to advise on analysis and design of works or programmes of management;
- Consider alternative approaches to funding, such as Public Private Partnerships;
- Where appropriate, seek contributions from developers or other direct beneficiaries of works, in accordance with Planning Policy Statement 25.

- Ensure that appropriate maintenance regimes are in place for flood defences for which the Council takes responsibility;
- Inform landowners of what responsibilities for maintenance rest with them (see paragraph 3.1 below);
- Make publicly available the Council's expenditure plans for flood defence maintenance and capital works. This will be identified in the Council's budget and programme of works.
- Play a positive role in fulfilling our statutory and other responsibilities for furthering nature conservation, including achievement of the Government's environmental obligations and targets arising from Planning Policy Guidance Note 9 (Nature Conservation) and the UK Biodiversity Action Plan. In particular we will:
 - Fulfil our responsibilities in relation to nationally and internationally important conservation areas and threatened and declining species, under the Wildlife and Countryside Act 1981 and as a competent authority under the terms of the Conservation (Natural Habitats &c.) Regulations 1994.
 - Co-operate with English Nature and the Environment Agency in completing and implementing Coastal Habitat Management Plans (CHaMPs) covering our area, drawing on English Nature/Environment Agency guidance for plan production;
 - When carrying out flood defence works, seek opportunities for environmental enhancement, and aim to avoid damage to environmental interest and to ensure no net loss to habitats covered by the UK Biodiversity Action Plan and the City of York Local Biodiversity Action Plan. We will monitor all losses and gains of such habitats as a result of these operations and report on them annually to the Environment Agency; and
 - Ensure that, for those Water Level Management Plans where we are the lead operating authority, we work in partnership with English Nature to complete, implement and review Plans in accordance with MAFF guidance on plan completion and the timetables set out in MAFF High Level Targets.

Objective (c): To discourage inappropriate development in areas at risk from flooding and coastal erosion.

As the local planning authority for our area, City of York Council will take account of flooding risks in all matters relating to development control, including development plans and individual planning applications, in accordance with Planning Policy Guidance Notes 20 and 25 (now PPS25). It will also apply its own Development Control Policy, GP15a in the Local Plan, as amended April 2005, shown in Appendix 5.

3. OUR ASSESSMENT OF THE RISK OF FLOODING AND EROSION IN OUR AREA AND WHAT WE WILL DO TO REDUCE OR MANAGE THAT RISK

Flood and defence responsibilities

- 3.1 Apart from certain obligations to protect internationally important habitats under the EU Habitats Directive, all flood and coastal defence works are undertaken under permissive powers. This means that operating authorities, such as City of York Council, are not obliged to carry out flood defence works. It is also important to note that the Council does not normally accept responsibility for maintenance of flood defences on private land. This is the responsibility of the landowner.
- 3.2 City of York Council is the relevant operating authority for flood defences on ordinary watercourses, which are not within the area of an internal drainage board.
- 3.3 The flood defences that are owned or managed by the Council are detailed in our return for the database, which is maintained by the Environment Agency.
- 3.4 The Environment Agency is the relevant operating authority for flood defences on designated main rivers. Culverts under roads are generally the responsibility of the City of York Council as Highways Authority or in some cases the Highways Agency.

Assessment of flood risk

- 3.5 There are 5.65 km of ordinary watercourses for which City of York Council is the relevant operating authority. These are detailed as follows: -

Watercourse	Length of open watercourse (km)	Length of culvert (km)
Tang Hall Beck	1.57	0.86
Osbalwick Beck	1.20	0.37
South Beck	0.15	0.16
Burdyke	nil	1.34

These are all of the watercourses within the Council's drainage authority area. Other ordinary watercourses within the City Council boundary are the responsibility of the six Internal Drainage Boards listed in paragraph 1.4. The River Foss upstream of Yearsley Weir is the responsibility of the Foss Internal Drainage Board. The River Ouse, and the River Foss between Yearsley Weir and its confluence with the River Ouse, are designated as Main River and thus the responsibility of the Environment Agency. The total length of Main River in the authority's area is 45.1km.

- 3.6 We have agreed with the Environment Agency that within the Council's area all 5.65km of the watercourses should be classified as "critical ordinary watercourses" (i.e. watercourses which are not classified as "main river" but which the Council has agreed with the Environment Agency to be critical because they have the potential to put at risk from flooding large numbers of people and property). The watercourses concerned are Tang Hall Beck, Osbalwick Beck, South Beck and Burdyke.
- 3.7 Based on historical flooding information, coupled with the Environment Agency's floodplain maps, the Council has carried out an assessment of the risk of flooding from the ordinary watercourses in its area. The main areas of the City at risk of flooding from these watercourses are adjacent to Tang Hall and Osbalwick Becks, and the Clifton Green and Water Lane areas under which Burdyke passes in culvert. These areas have suffered flooding in the past but now benefit from flood defences. These areas are, however, still considered to be at risk in the event of the defences being breached or overtopped, or the failure of the Council's Burdyke pumping station or the Environment Agency's Foss Barrier pumping station.

The Council has two installations, which operate as part of these defences: -

- The Foss Islands High Level Culvert operates as an overflow from Tang Hall Beck to the River Foss. The beck normally discharges to the River Ouse, but at times of high flow in the beck can be diverted directly to the River Foss. Flow in this 230m long twin culvert is regulated by penstocks located in the Council's Foss Islands Depot. These are manually operated.
- Burdyke Pumping Station is located on Burdyke culvert within the EA floodbank between the end of Westminster Road and the River Ouse. The station is operated when the River Ouse reaches a level of 3.8m above normal summer level and pumps the flow in the culvert directly to the River Ouse.

The Council is satisfied that there are minimal risks to human life created by these flood risks from ordinary watercourses, but emphasises the need for the Environment Agency's flood warnings to be heeded, where these are provided (see below).

Action to reduce or manage flood risks

- 3.8 The main means by which flood risks will be managed, is through the Environment Agency's flood warning dissemination plan dated 1 August 2000, reference DO9. This makes arrangements for warnings to be provided by the Environment Agency in the following locations within this Council's area, including individual warnings to high-risk properties.

FLOOD WARNINGS FOR THE RIVER OUSE IN YORK

EA FLOOD WARNING REFERENCE NUMBER	AREA AFFECTED	LEVEL AT WHICH FLOODING STARTS (m above Summer level)
DW710	York riverside, Kings Staith, Queens Staith, South Esplanade, New Walk	2.3
DW723	Naburn Lock	2.5
DW712	St Georges Field car park, Terry Avenue, New Walk, Blue Bridge Lane, Queens Staith Road, King Street, Friar's Terrace, Tower Place, Lower Friargate, Cumberland Street, 32 Grange Garth, Acaster Lane at Bishopthorpe	3.8
DW718	Naburn access roads	3.9
DW716	Peckitt Street, Skeldergate, Rowntree Park, Caravan Park, Lilac House	4.2
DW722	York Road (A19), Lilac Cottages, Pumping Station Cottages, New Walk	4.2
DW720	105 Alma Terrace & 4 & 5 South Esplanade	4.8

SEVERE FLOOD WARNINGS FOR THE RIVER OUSE IN YORK

EA SEVERE FLOOD WARNING REFERENCE NUMBER	AREA AFFECTED	LEVEL AT WHICH FLOODING STARTS (m above Summer level)
DS724	Naburn Village, Acaster Malbis, The Ship Inn and properties adjacent to the river at Acaster Malbis	4.6
DS730	Clifton Green, Westminster Road, Longfield Terrace and Almerey Terrace	5.45
DS734	Marygate	5.45
DS736	Leeman Road, Acomb Landing and York Waterworks	5.45
DS738	Hamilton Drive	5.45
DS740	Lower Ebor Street, Lower Darnborough Street and River Street	5.45
DS742	Huntington Road, Foss Islands Road and Walmgate	5.45
DS744	Skeldergate	5.45
DS750	Fordland's Road and Pumping Station Cottages	5.45
DS752	North Street	5.45
DS753	Rawcliffe	5.45

FLOOD WARNINGS FOR THE RIVER DERWENT AT ELVINGTON

EA FLOOD WARNING REFERENCE NUMBER	AREA AFFECTED
DW652	Elvington and Sutton on Derwent

City of York Council has included plans for responding to both major and minor flooding in its Emergency Planning Procedures and has arrangements for cascading warnings received from the Environment Agency to relevant Council services.

- 3.9 The Council has a programme in place to inspect the state of flood defences (whether or not owned by the Council) on all ordinary watercourses, and all critical ordinary watercourses and related culverts.
- 3.10 The Council will ensure that regular maintenance is carried out on the flood defences and channels which we own, or for which we accept responsibility, so that they operate at optimum efficiency. Where the responsibility for maintenance rests with a landowner, we will aim to secure co-operation in ensuring appropriate maintenance takes place, drawing on enforcement powers if necessary.
- 3.11 The Council currently has no major capital work planned for flood alleviation works in its area. In our maintenance programme we will continue to ensure that watercourses operate to their optimum efficiency by clearing the excess silt and keeping screens clear of debris.
- 3.12 The Council, acting as a local planning authority, will ensure that flood risks are further minimised by following current Government guidance, its own local policies, and Planning Policy Statement 25 on development in flood risk areas, when this is published. The inclusion of measures for ensuring sustainable urban drainage systems to control surface water run off will also be reviewed, in line with PPS25.

4. PARTNERSHIPS AND REVIEW OF THIS POLICY STATEMENT

- 4.1 The Council has set out its policy and approach to flood defence. We recognise the need to work in partnership with Central Government and other operating authorities. Our local population also has an important part to play, in recognising the vital importance of watercourses in controlling flood risk and the need to avoid blockages, whether by dumping rubbish or obstructing flows in other ways. We ask members of the public to let us know of any problems, which might increase the risk of flooding.
- 4.2 City of York Council intends to review this policy statement, following the publication of PPS25. The Council welcomes any comments on the approach and policies set out in this statement.

References

- 1 Strategy for Flood and Coastal Defence in England and Wales MAFF and Welsh Office, September 1993
- 2 High Level Targets for Flood and Coastal Defence Operating Authorities and Elaboration of the Environment Agency's Flood Defence Supervisory Duty MAFF, November 1999
- 3 City of York Local Plan Deposit Draft, May 1998.
- 4 River Derwent Catchment Flood Defence Improvement Strategy, May 2001.

Appendix 5: CITY OF YORK DRAFT LOCAL PLAN

INCORPORATING THE 4th SET OF CHANGES – DEVELOPMENT

CONTROL LOCAL PLAN : APPROVED APRIL 2005”. POLICY GP15A :

DEVELOPMENT AND FLOOD RISK

“There will be a presumption against built development (except for essential infrastructure) within the functional floodplain outside existing settlement limits.

Proposals for new built development on previously undeveloped land outside defined settlement limits will only be granted where it can be demonstrated that the development will not result in the net loss of floodplain storage capacity, not impede water flows and not increase flood risk elsewhere.

All applications in the low to medium risk(2) or high risk(3) areas should submit a Flood Risk Assessment (FRA) providing an assessment of additional risk arising from the proposal and the measures proposed to deal with these effects. Developers must satisfy the Local Planning Authority that any flood risk will be successfully managed with the minimum environmental effect and ensure that the site can be developed, serviced and occupied safely.

The use of sustainable drainage systems to mimic natural drainage will be encouraged in all new developments in order to reduce surface water runoff.

Discharges from new development should not exceed the capacity of existing and proposed receiving sewers and watercourses and long-term runoff from development sites should always be less than the level of pre development rainfall runoff.

Where required the provision and future maintenance of flood mitigation and defence measures will be sought from the developer.

(1) Low risk areas are defined as having an annual probability of flooding (river) less than 0.1% (1 in 1000 years)

(2) Low to medium areas of flood risk are defined as having an annual probability of flooding (river) 0.1-1.0%(1 in 100 to 1 in 1000 years)

(3) High risk areas of flood risk are defined as having an annual probability of flooding (river) greater than 1.0% (1 in 100 years)”

Appendix 6: PPS25 – ‘Development and Flood Risk’

Planning shapes the places where people live and work and the country we live in. It plays a key role in supporting the Government's wider economic, social and environmental objectives and for sustainable communities.



PLANNING

Planning Policy Statement 25:
Development and Flood Risk



Planning Policy Statement 25: Development and Flood Risk

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Planning Policy Statement 25: Development and Flood Risk

Planning Policy Statements (PPS) set out the Government's national policies on different aspects of land use planning in England. This PPS replaces Planning Policy Guidance Note 25: *Development and Flood Risk*, published in 2001, which is hereby cancelled.

The policies in this PPS should be taken into account by regional planning bodies in the preparation of Regional Spatial Strategies; by the Mayor of Greater London in relation to the Spatial Development Strategy in London; and, in general, by local planning authorities in the preparation of local development documents. They may also be material to decisions on individual planning applications. These policies complement other national planning policies and should be read in conjunction with Government policies for flood risk and water management, including those set out in *Making Space for Water* and forthcoming Water Framework Directive guidance.

A supporting Practice Guide will provide guidance on the implementation of the policies set out in this PPS.

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Background

1. Flooding from rivers and coastal waters is a natural process that plays an important role in shaping the natural environment. However, flooding threatens life and causes substantial damage to property. The effects of weather events can be increased in severity both as a consequence of previous decisions about the location, design and nature of settlement and land use, and as a potential consequence of future climate change. Although flooding cannot be wholly prevented, its impacts can be avoided and reduced through good planning and management.
2. Climate change over the next few decades is likely to mean milder wetter winters and hotter drier summers in the UK, while sea levels will continue to rise. These factors will lead to increased and new risks of flooding within the lifetime of planned developments.
3. All forms of flooding and their impact on the natural and built environment are material planning considerations. Planning Policy Statement 1: *Delivering Sustainable Development* sets out the Government's objectives for the planning system, and how planning should facilitate and promote sustainable patterns of development, avoiding flood risk and accommodating the impacts of climate change. The Planning Policy Statement *Planning and Climate Change*¹, provides expanded policy on planning's contribution to mitigating and adapting to climate change.
4. Positive planning has an important role in helping deliver sustainable development (see Annex A) and applying the Government's policy on flood risk management. It avoids, reduces and manages flood risk by taking full account in decisions on plans and applications of:
 - present and future flood risk, involving both the statistical probability of a flood occurring and the scale of its potential consequences, whether inland or on the coast; and
 - the wider implications for flood risk of development located outside flood risk areas.

¹ Planning Policy Statement: *Planning and Climate Change*, consultation December 2006

Key Planning Objectives

5. The aims of planning policy on development and flood risk are to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas at highest risk. Where new development is, exceptionally, necessary in such areas, policy aims to make it safe without increasing flood risk elsewhere and where possible, reducing flood risk overall.
6. Regional planning bodies (RPBs)² and local planning authorities (LPAs) should prepare and implement planning strategies that help to deliver sustainable development by:

Appraising risk

- identifying land at risk and the degree of risk of flooding from river, sea and other sources in their areas;
- preparing Regional Flood Risk Appraisals (RFRAs) or Strategic Flood Risk Assessments (SFRAs) as appropriate, as freestanding assessments that contribute to the Sustainability Appraisal³ of their plans;

Managing risk

- framing policies for the location of development which avoid flood risk to people and property where possible, and manage any residual risk, taking account of the impacts of climate change;
- only permitting development in areas of flood risk when there are no reasonably available sites in areas of lower flood risk and benefits of the development outweigh the risks from flooding;

Reducing risk

- safeguarding land from development that is required for current and future flood management eg conveyance and storage of flood water, and flood defences;
- reducing flood risk to and from new development through location, layout and design, incorporating sustainable drainage systems (SUDS);
- using opportunities offered by new development to reduce the causes and impacts of flooding eg surface water management plans; making the most of the benefits of green infrastructure for flood storage, conveyance and SUDS; re-creating functional floodplain; and setting back defences;

² Regional Assemblies are recognised by the Secretary of State as the Regional Planning Body and Regional Housing Body with responsibility for preparing the Regional Spatial Strategy and Regional Housing Strategy for their region.

³ Under the Planning and Compulsory Purchase Act 2004, Sustainability Appraisal is required for Regional Spatial Strategies, Development Plan Documents and Supplementary Planning Documents. Sustainability Appraisal helps planning authorities to fulfil the objective of contributing to the achievement of sustainable development in preparing their plans. Guidance is available at www.communities.gov.uk/index.asp?id=1164579

A partnership approach

- working effectively with the Environment Agency, other operating authorities and other stakeholders to ensure that best use is made of their expertise and information so that plans are effective and decisions on planning applications can be delivered expeditiously; and
- ensuring spatial planning supports flood risk management policies and plans, River Basin Management Plans and emergency planning.

Decision-making Principles

7. RPBs and LPAs should adhere to the following principles in preparing planning strategies:
 - RPBs should ensure their Regional Spatial Strategies (RSSs) include a broad consideration of flood risk from all sources and set out a strategy for managing it. This should be consistent with RFRAs and SFRAs, the policies in this PPS and Shoreline Management Plans, Catchment Flood Management Plans and River Basin Management Plans prepared by the Environment Agency under the Water Framework Directive;
 - LPAs should prepare Local Development Documents (LDDs) that set out policies for the allocation of sites and the control of development which avoid flood risk to people and property where possible and manage it elsewhere, reflecting the approach to managing flood risk in this PPS and in the RSS for their region;
 - where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, LPAs should consider whether there are opportunities in the preparation of LDDs to facilitate the relocation of development, including housing⁴ to more sustainable locations at less risk from flooding;
 - flood risk should be considered alongside other spatial planning issues such as transport, housing, economic growth, natural resources, regeneration, biodiversity, the historic environment and the management of other hazards. Policies should recognise the positive contribution that avoidance and management of flood risk can make to the development of sustainable communities, including improved local amenities and better overall quality of life. They should be integrated effectively with other strategies of material significance such as Regional Economic Strategies; and
 - the sustainability appraisal of RSSs and LDDs should incorporate or reflect the RPB's RFRA and the planning authority's SFRA, so as to ensure that the planning strategies for the area support the Government's objectives for development and flood risk set out in this PPS.

⁴ See Planning Policy Statement 3: *Housing* www.communities.gov.uk/index.asp?id=1504592

8. In addition, LPAs should in determining planning applications:
- have regard to the policies in this PPS and, as relevant, in the RSS for their region, as material considerations which may supersede the policies in their existing development plan, when considering planning applications for developments in flood risk areas before that plan can be reviewed to reflect this PPS;
 - ensure that planning applications are supported by site-specific flood risk assessments (FRAs) as appropriate;
 - apply the sequential approach (see paras. 14–17) at a site level to minimise risk by directing the most vulnerable development to areas of lowest flood risk, matching vulnerability of land use to flood risk;
 - give priority to the use of SUDS; and
 - ensure that all new development in flood risk areas is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be safely managed.

Risk-based Approach

9. A risk-based approach should be adopted at all levels of planning. Applying the source-pathway-receptor model to planning for development in areas of flood risk requires:
 - a strategic approach through policies in RSSs and LDDs which avoid adding to the causes or “sources” of flood risk, by such means as avoiding inappropriate development in flood risk areas and minimising run-off from new development onto adjacent and other downstream property, and into the river systems;
 - managing flood “pathways” to reduce the likelihood of flooding by ensuring that the design and location of the development maximises the use of SUDS, and takes account of its susceptibility to flooding, the performance and processes of river/coastal systems and appropriate flood defence infrastructure, and of the likely routes and storage of floodwater, and its influence on flood risk downstream; and
 - reducing the adverse consequences of flooding on the “receptors” (ie people, property, infrastructure, habitats and statutory sites) by avoiding inappropriate development in areas at risk of flooding.

Flood Risk Assessments

10. Flood risk assessment should be carried out to the appropriate degree at all levels of the planning process, to assess the risks of all forms of flooding to and from development taking climate change into account and to inform the application of the sequential approach.
11. A RFRA should inform the RSS, taking account of SFRA's where available.
12. A SFRA should be carried out by the local planning authority to inform the preparation of its LDDs, having regard to catchment-wide flooding issues which affect the area. The SFRA will provide the information needed to apply the sequential approach (see paras. 14–17). Policies in LDDs should set out requirements for site-specific Flood Risk Assessments (FRAs) to be carried out by developers and submitted with planning applications in areas of flood risk identified in the plan, under circumstances set out in this PPS.
13. Minimum requirements for all levels of flood risk assessment are given in Annex E. Further guidance will be given in the Practice Guide to accompany this PPS.

The Sequential Approach

14. A sequential risk-based approach to determining the suitability of land for development in flood risk areas is central to the policy statement and should be applied at all levels of the planning process.
15. Regional Planning Bodies (RPBs) when developing Regional Spatial Strategies should apply the sequential approach when establishing locational criteria for regionally significant land uses, including the identification of broad locations.⁵ Local planning authorities should apply the sequential approach as part of the identification of land for development in areas at risk of flooding.

⁵ See para. 1.16-1.17 PPS11: *Regional Spatial Strategies* available at www.communities.gov.uk/index.asp?id=1143839

The Sequential Test

16. LPAs allocating land in LDDs for development should apply the Sequential Test (see Annex D and Table D.1) to demonstrate that there are no reasonably available sites in areas with a lower probability of flooding that would be appropriate to the type of development or land use proposed. A sequential approach should be used in areas known to be at risk from other forms of flooding.
17. In areas at risk of river or sea flooding, preference should be given to locating new development in Flood Zone 1.⁶ If there is no reasonably available site in Flood Zone 1, the flood vulnerability of the proposed development (see Table D.2, Annex D) can be taken into account in locating development in Flood Zone 2 and then Flood Zone 3. Within each Flood Zone new development should be directed to sites at the lowest probability of flooding from all sources (see Annex C) as indicated by the SFRA.

The Exception Test

18. If, following application of the Sequential Test in Annex D, it is not possible, consistent with wider sustainability objectives, for the development to be located in zones of lower probability of flooding, the Exception Test can be applied as detailed in paras. D9–D14. The Test provides a method of managing flood risk while still allowing necessary development to occur.
19. The Exception Test is only appropriate for use when there are large areas in Flood Zones 2 and 3, where the Sequential Test alone cannot deliver acceptable sites, but where some continuing development is necessary for wider sustainable development reasons, taking into account the need to avoid social or economic blight and the need for essential civil infrastructure to remain operational during floods. It may also be appropriate to use it where restrictive national designations such as landscape, heritage and nature conservation designations, eg Areas of Outstanding Natural Beauty (AONBs), Sites of Special Scientific Interest (SSSIs) and World Heritage Sites (WHS), prevent the availability of unconstrained sites in lower risk areas.
20. Where use of the Exception Test is required, decision-makers should apply it at the earliest stage possible in planning, to all LDD allocations for development and all planning applications other than for minor development.⁷ All the three elements (see para. D.9, Annex D) of the test will have to be passed for development to be allocated or permitted.

⁶ Flood Zones are defined in Table D.1, Annex D. The Flood Zones refer to the probability of flooding from rivers, the sea and tidal sources and ignore the presence of existing defences, because these can be breached, overtopped and may not be in existence for the lifetime of the development.

⁷ Definition of minor development:

- Minor non-residential extensions: Industrial/Commercial/Leisure etc. extensions with a footprint less than 250 m².
- Alterations: development that does not increase the size of buildings eg alterations to external appearance.
- ‘Householder’ development: eg sheds, garages, games rooms etc. within the curtilage of the existing dwelling in addition to physical extensions to the existing dwelling itself. This definition EXCLUDES any proposed development that would create a separate dwelling within the curtilage of the existing dwelling eg subdivision of houses into flats.

Responsibilities

21. There is no general statutory duty on the Government to protect land or property against flooding. But the Government recognises the need for action to be taken to safeguard the wider social and economic wellbeing of the country, including adapting to the impacts of climate change. Operating authorities (see Annex H) have permissive powers but not a statutory duty to carry out or maintain flood defence works in the public interest.

The Owner/Developer

22. Landowners have the primary responsibility for safeguarding their land and other property against natural hazards such as flooding. Individual property owners and users are also responsible for managing the drainage of their land in such a way as to prevent, as far as is reasonably practicable, adverse impacts on neighbouring land. Those proposing development are responsible for:
- demonstrating that it is consistent with the policies in this PPS and those on flood risk in the LDD;
 - providing a FRA demonstrating:
 - whether any proposed development is likely to be affected by current or future flooding from any source;
 - satisfying the LPA that the development is safe and where possible reduces flood risk overall;
 - whether it will increase flood risk elsewhere; and
 - the measures proposed to deal with these effects and risks. Any necessary flood risk management measures should be sufficiently funded to ensure that the site can be developed and occupied safely throughout its proposed lifetime;
 - designs which reduce flood risk to the development and elsewhere, by incorporating sustainable drainage systems (see Annex F) and where necessary, flood resilience measures (see Annex G); and
 - identifying opportunities to reduce flood risk, enhance biodiversity and amenity, protect the historic environment and seek collective solutions to managing flood risk.
23. These matters can affect the value of land, the cost of developing it and the cost of its future management and use. They should be considered as early as possible in preparing development proposals.

The Regional Planning Body

24. The RPB should take flood risk into account in determining strategic planning considerations in the RSS for its region, including the criteria to be used for selecting and determining broad strategic locations for housing provision and transport infrastructure. Its RFRA should identify the risk to its regionally strategic locations. The RPB should consult the Environment Agency and other operating authorities on flood risk issues when preparing its RSS.

The Local Planning Authority

25. LPAs should consult the Environment Agency and other relevant bodies (including adjacent LPAs), when preparing policies in their LDDs on flood risk management and in relation to areas potentially identified as at risk of flooding. Their sustainability appraisals, land allocations and development control policies should all be informed by a SFRA carried out in liaison with the Environment Agency.
26. Following the coming into force, on 1 October 2006, of the amendment⁸ to Article 10 of The Town and Country Planning (General Development Procedure) Order 1995 (“the GDPO”), LPAs are required to consult the Environment Agency on all applications for development in flood risk areas (except minor development), including those in areas with critical drainage problems and for any development on land exceeding 1 hectare outside flood risk areas. Where the Environment Agency (or other organisations) object to an application on flood risk grounds, but the LPA considers that it should be approved, the LPA should contact the Environment Agency (or the other consultees if appropriate) to allow discussion of the case and the opportunity for further representations or comments to be made. LPAs, advised by the Environment Agency and other relevant organisations, should determine applications for planning permission taking account of all material considerations, including the issue of flood risk, the FRA prepared by the developer (when required) and proposals for reducing or managing that risk.
27. As noted above, the GDPO (as amended) covers all applications for development in flood risk areas (except minor development). If the Environment Agency objects to an application for major development⁹ on flood risk grounds, all parties (the LPA, the Environment Agency and the applicant), should discuss and agree the course of action which would need to be taken to enable the Environment Agency to withdraw its objection. There should be effective on-going liaison so that each party is aware at all stages in the process of the position of the others with regard to the application.
28. If, after discussions, it becomes clear that the Environment Agency is unable to withdraw its objection, but the LPA remains minded to approve an application for major development, the Town and Country Planning (Flooding) (England) Direction 2007 requires the LPA to notify the Secretary of State of the proposal. This provides the Secretary of State with an opportunity to check the application’s general compliance with the policies in this PPS and

⁸ Introduced by Statutory Instrument 2006 No.2375 “The Town and Country Planning (General Development Procedure) (Amendment) (No.2) (England) Order 2006”. Available at www.opsi.gov.uk/si/si2006/uksi_20062375_en.pdf

⁹ Major development is defined in The Town and Country Planning (Flooding) (England) Direction 2007 as:

- (a) in respect of residential development, a development where the number of dwellings to be provided is 10 or more, or the site area is 0.5 hectares or more; or
- (b) in respect of non-residential development, a development where the new floorspace to be provided is 1,000 square metres or more, or the site area is 1 hectare or more;

“flood risk area” means:

- (a) land in an area within Flood Zones 2 or 3; or
- (b) land in an area within Flood Zone 1 which has critical drainage problems and which has been notified for the purposes of article 10 of the Order (see footnote 6, above) to the local planning authority by the Environment Agency;

‘Flood zones’ has the same meaning as in document at footnote 8, above.

to consider whether it would be appropriate to call it in for determination. The Secretary of State would wish to be assured in considering such cases that all reasonable steps have been taken by the LPA, the Environment Agency and the applicant through discussions to consider ways in which the application might have been amended, or additional information provided, which would have allowed the Environment Agency's objection to be withdrawn.

29. LPAs should notify the Environment Agency of the outcome of all planning applications for development in flood risk areas, including those for major development. Other organisations which have been consulted, such as Internal Drainage Boards (IDBs), should be notified where conditions attached to planning permissions may affect their area of concern, such as local drainage.

The Environment Agency

30. The Environment Agency has statutory responsibility for flood management and defence in England and will support the planning system by providing timely information and advice on flooding issues that is fit for purpose. At a strategic level, it provides RPBs and LPAs with advice on the preparation of RFRAs and SFRAs. It is a statutory consultation body for RSSs and LDDs, for strategic environmental assessment and sustainability appraisal, for planning applications as defined in the GDPO and for environmental impact assessment. It also provides advice to those proposing developments and undertaking FRAs.
31. The Environment Agency will be consulted by local planning authorities on all applications for development in flood risk areas and should contribute to their consideration by providing advice, as set out in para. 26. A small number of the applications that the Environment Agency will be consulted on will be for major development. The procedure for dealing with these particular types of application, where the Environment Agency lodges an objection, is set out in paras. 27 and 28.

Other Bodies

32. Details of the roles of other main stakeholder bodies are given in Annex H.

Working in Constructive Partnership

33. There should be early consideration of flood risk in the formulation of Regional Spatial Strategies, Local Development Documents and proposals for development by regional planning bodies, local planning authorities, the Environment Agency, other stakeholders (see Annex H) and developers. This should identify opportunities for development of infrastructure that offers wider sustainability benefits. These include dual use ie flood storage and recreation and realising cost effective solutions for the reduction and management of flood risk. Consultation should also identify flood risk problems that will need to be addressed.

34. Proposers of development which may be affected by, or may add to flood risk should arrange pre-application discussions with the LPA and the Environment Agency, and, where relevant, other bodies such as Internal Drainage Boards, sewerage undertakers, highways authorities and reservoir owners and operators. Such discussions should identify the likelihood and possible extent and nature of the flood risk, to assist in scoping the FRA and identify the information that will be required by the LPA to reach a decision on the application when it is submitted. LPAs should advise intending developers to undertake these steps where they appear necessary, but have not yet been addressed.

Monitoring and Review

35. Effective monitoring and review is essential to reducing and managing flood risk. The Environment Agency and local planning authorities have a key role in the provision of relevant information. The principal national source of information is the annual monitoring of the impact of the technical advice on flood risk provided by the Environment Agency on planning decisions made by LPAs. This is given annually in the Environment Agency's High Level Target 5 (HLT5) report produced jointly with local government for the Department for Environment, Food and Rural Affairs (Defra) and the Department for Communities and Local Government.
36. Key indicators from the HLT5 report are:
 - the number of planning applications permitted by LPAs, where the outcome is known, against a sustained objection from the Environment Agency on flood risk grounds, as a percentage of the total number of applications to which the Environment Agency sustained an objection on flood risk grounds;
 - the number of planning applications for major development permitted by LPAs, where the outcome is known, against a sustained objection from the Environment Agency on flood risk grounds, as a percentage of the total number of planning applications permitted against sustained Environment Agency advice on flood risk;
 - the lack of a FRA or an inadequate FRA cited as the reason for an Environment Agency objection to planning applications, as a percentage of the total number of its objections on flood risk grounds; and
 - the number of decision notices received from LPAs by the Environment Agency as a percentage of the number of objections the Environment Agency made to planning applications on flood risk grounds.
37. LPAs should request FRAs in accordance with Annex E. They should work closely with the Environment Agency on resolving objections to development proposals. If the current HLTs are changed or replaced by alternative measures during the lifetime of this guidance, LPAs are encouraged to contribute positively to providing information to assist the effective monitoring of flood risk.

Annex A: The Government's Aims for Sustainable Development

- A1. The Government set out five principles for sustainable development in its 2005 strategy for sustainable development *Securing the Future – UK Government Sustainable Development Strategy*.¹⁰
- **Living Within Environmental Limits** – Respecting the limits of the planet's environment, resources and biodiversity – to improve our environment and ensure that the natural resources needed for life are unimpaired and remain so for future generations;
 - **Ensuring a Strong, Healthy and Just Society** – Meeting the diverse needs of all people in existing and future communities, promoting personal wellbeing, social cohesion and inclusion, and creating equal opportunity for all;
 - **Achieving a Sustainable Economy** – Building a strong, stable and sustainable economy which provides prosperity and opportunities for all, and in which environmental and social costs fall on those who impose them (polluter pays), and efficient resource use is incentivised;
 - **Promoting Good Governance** – Actively promoting effective, participative systems of governance in all levels of society– engaging people's creativity, energy, and diversity; and
 - **Using Sound Science Responsibly** – Ensuring policy is developed and implemented on the basis of strong scientific evidence, whilst taking into account scientific uncertainty (through the precautionary principle) as well as public attitudes and values.
- A2. The shared priorities for action contained in *Securing the Future* include preparing for the climate change that cannot now be avoided and creating sustainable communities that embody the principles of sustainable development at the local level.
- A3. Planning Policy Statement 1 (PPS1): *Delivering Sustainable Development*¹¹ sets out the overarching planning policies on the delivery of sustainable development through the planning system. It sets out how regional planning bodies and local planning authorities are expected to prepare development plan policies which avoid new development in areas at risk of flooding and sea level rise, and take climate change impacts into account in the location and design of the development. The Planning Policy Statement *Planning and Climate Change*¹², provides expanded policy on planning's contribution to mitigating and adapting to climate change.

¹⁰ Defra, 2005. *Securing the Future – UK Government Sustainable Development Strategy* www.sustainable-development.gov.uk/publications/uk-strategy/index.htm

¹¹ ODPM, 2005. Planning Policy Statement 1 (PPS1): *Delivering Sustainable Development* www.communities.gov.uk/index.asp?id=1143804

¹² Planning Policy Statement: *Planning and Climate Change*, consultation December 2006

Annex B: Climate Change

- B1. There is an increasing body of scientific evidence that the global climate is changing as a result of human activity. Past, present and future emissions of greenhouse gases are expected to cause significant global climate change during this century. The nature of climate change at a regional level will vary: for the UK, projections of future climate change indicate that more frequent short-duration, high-intensity rainfall and more frequent periods of long-duration rainfall of the type responsible for the 2000 floods could be expected. Sea levels will continue to rise. These kinds of changes will have implications for river flooding and also for local flash flooding. There are several indications that the climate in the UK is already changing. Central England's temperature rose by almost 1°C during the twentieth century. Heat waves have become more frequent in summer and there are now fewer frosts and winter cold spells. Winters over the last 200 years have become wetter relative to summers; a larger proportion of winter precipitation in all regions now falls on heavy rainfall days than was the case 50 years ago.
- B2. To help organisations (including local authorities and regional planning bodies) to assess their vulnerability to climate change and plan appropriate adaptation strategies, the Government established the UK Climate Impacts Programme (UKCIP).¹³ Scenarios of future climate change in the UK¹⁴ were produced for the UKCIP in 2002 and published by the Department for Environment, Food and Rural Affairs (Defra). Over the next 2-3 years, this climate change scenario information will be revised, expanded and developed to better meet stakeholder needs.
- B3. The companion guide supporting the PPS *Planning and Climate Change*¹⁵ will provide guidance on how planning should secure new development and shape places resilient to the effects of climate change.
- B4. The Foresight project on future flood risk reported in April 2004.¹⁶ The project found that, using the UKCIP02 climate change projections, together with scenarios of potential economic and social changes, annual damage from flooding may rise from around £100 million to between £460 million (under the community orientated *Local Stewardship scenario*) and £2,500 million (under the more consumerist *World Markets scenario*) by 2080.
- B5. Global sea level will continue to rise, depending on greenhouse gas emissions and the sensitivity of the climate system. The relative sea level rise in England also depends on the local vertical movement of the land, which is generally falling in the south-east and rising in the north and west. Allowances for the regional rates of relative sea level rise shown in Table B.1 should be used as a starting point for considering flooding from the sea, along with the sensitivity ranges for wave height and wind speed in Table B.2, in preparing flood risk assessments.

¹³ www.ukcip.org.uk

¹⁴ Defra, 2002. *Scenarios of future climate change in the UK*
http://www.ukcip.org.uk/scenarios/ukcip02/documentation/ukcip02_scientific_report.asp

¹⁵ see footnote 1

¹⁶ DTI, 2004. *The Foresight Future Flooding project*
www.foresight.gov.uk/Previous_Projects/Flood_and_Coastal_Defence/Reports_and_Publications/Project_Outputs/Outputs.htm

Table B.1 Recommended contingency allowances for net sea level rise

Administrative Region	Net Sea Level Rise (mm/yr) Relative to 1990			
	1990 to 2025	2025 to 2055	2055 to 2085	2085 to 2115
East of England, East Midlands, London, SE England (south of Flamborough Head)	4.0	8.5	12.0	15.0
South West	3.5	8.0	11.5	14.5
NW England, NE England (north of Flamborough Head)	2.5	7.0	10.0	13.0

Notes:

1. For deriving sea levels up to 2025, the 4mm/yr, 3mm/yr and 2.5mm/yr rates (covering the three groups of administrative Regions respectively), should be applied back to the 1990 base sea level year. From 2026 to 2055, the increase in sea level in this period is derived by adding the number of years on from 2025 (to 2055), multiplied by the respective rate shown in the table. Subsequent time periods 2056-2085 and 2086-2115 are treated similarly.
 2. Refer to Defra FCDPAG3 *Economic Appraisal Supplementary Note to Operating Authorities – Climate Change Impacts*, October 2006, for details of the derivation of this table. In particular, Annex A1 of this Note shows examples of how to calculate sea level rise.
 3. Vertical movement of the land is incorporated in the table and does not need to be calculated separately.
- B6. The rise in sea level will change the frequency of occurrence of high water levels relative to today’s sea levels, assuming no change in storminess. There may also be secondary impacts such as changes in wave heights due to increased water depths, as well as possible changes in the frequency, duration and severity of storm events. A 10 per cent sensitivity allowance should be added to offshore wind speeds and wave heights by the 2080s.
- B7. Extensive, low-lying coastal lands around most British estuaries are particularly susceptible to flooding. Changes to the drivers associated with coastal erosion (surges, waves, coastal sediment supply and morphology, and relative sea level rise) will affect the probability of flooding to new developments.
- B8. The climate changes already seen in the UK are consistent with the UKCIP02 scenarios. This suggests that winters will become wetter over the whole of the UK, by as much as 20 per cent by the 2050s. A shift in the seasonal pattern of rainfall is also expected, with summers and autumn becoming much drier than at present. Snowfall amounts will

decrease significantly throughout the UK, but the number of rain-days and the average intensity of rainfall are expected to increase. Although average seasonal wind speeds could increase over most of the country, there is currently much less certainty regarding the potential for greater storminess and the consequences for sea surges or extreme wave activity on coasts.

- B9. In making an assessment of the impacts of climate change on flooding from the land, rivers and sea as part of a flood risk assessment, the sensitivity ranges in Table B.2 may provide an appropriate precautionary response to the uncertainty about climate change impacts on rainfall intensities, river flow, wave height and wind speed.

Table B.2 Recommended national precautionary sensitivity ranges for peak rainfall intensities, peak river flows, offshore wind speeds and wave heights.

Parameter	1990 to 2025	2025 to 2055	2055 to 2085	2085 to 2115
Peak rainfall intensity	+5%	+10%	+20%	+30%
Peak river flow	+10%	+20%		
Offshore wind speed	+5%		+10%	
Extreme wave height	+5%		+10%	

Notes:

1. Refer to *Defra FCDPAG3 Economic Appraisal Supplementary Note to Operating Authorities – Climate Change Impacts, October 2006*, for details of the derivation of this table.
 2. For deriving peak rainfall, for example, between 2025-2055 multiply the rainfall measurement (in mm/hour) by 10 per cent and between 2055-2085 multiply the rainfall measurement by 20 per cent. So, if there is a 10mm/hour event, for the 2025-2055 period this would equate to 11mm/hour; and for the 2055/2085 period, this would equate to 12mm/hour. Other parameters in Table B.2 are treated similarly.
- B10. Sensitivity testing of the Flood Map produced by the Environment Agency, using the 20 per cent from 2025 to 2115 allowance for peak flows, suggests that changes in the extent of inundation are negligible in well-defined floodplains, but can be dramatic in very flat areas. However, changes in the depth of flooding under the same allowance will reduce the return period of a given flood. This means that a site currently located within a lower risk zone (eg Zone 2 in Table D.1, Annex D) could in future be re-classified as lying within a higher risk zone (eg Zone 3). This in turn could have implications for the type of development that is appropriate according to its vulnerability to flooding (see Table D.2, Annex D). It will therefore be important that developers, their advisors and local authorities refer to the current Flood Map and the SFRA when preparing and considering proposals.

- B11. Flooding in estuaries may result from the combined effects of high river flows and high sea surges. When taking account of impacts of climate change in flood risk assessments covering tidal estuaries, it will be necessary for the allowances for sea level rise in Table B.1 (see para. B5) and the allowances for peak flow, wave height and wind speed in Table B.2 (see para. B9) should be combined.¹⁷
- B12. Indirect impacts of climate change on land use and land management may change future flood risk. For example, changes in crop type, methods of cultivation and harvesting could affect the porosity and surface of the ground and hence the volume, speed and direction of storm run-off.
- B13. Adaptation to climate change requires an integrated approach across different sectors including land use, water resources, transport, biodiversity and recreation. This integrated approach should be reflected in flood risk assessment.
- B14. Knowledge and understanding of climate change is continuing to grow. The next UKCIP scenarios, due in 2008, are expected to provide more detail on regional climate changes and to express this information in probabilistic terms. Other areas where further research is in progress include climate-driven risks from groundwater and sewer flooding. The most up-to-date guidance on climate change and flooding from the Environment Agency, Defra, Communities and Local Government and the UKCIP should be considered in the preparation of Regional Flood Risk Appraisals, Strategic Flood Risk Assessments and site specific Flood Risk Assessments.

¹⁷ Refer to Defra *FCDPAG3 Economic Appraisal Supplementary Note to Operating Authorities – Climate Change Impacts*, October 2006. Annex A2 gives details of joint probability analysis.
www.defra.gov.uk/environ/fcd/pubs/pagn/climatechangeupdate.pdf

Annex C: Forms of Flooding

- C1. Flooding is a natural process and can happen at any time in a wide variety of locations. A number of forms of flooding present a range of different risks. The speed of inundation and the duration varies greatly. With climate change, the frequency, patterns and severity of flooding are forecast to change and become more damaging.
- C2. The limits of flood risk areas cannot be defined precisely because floods with similar probability can arise from different combinations of weather, sources, rainfall patterns, local topography and patterns of development.
- C3. Flooding can come from rivers and the sea, directly from rainfall on the ground surface and from rising groundwater, overwhelmed sewers and drainage systems. Every flood will have a different impact on people, property and the environment. The consequences of flooding depend greatly on land use. Overtopping and/or breach of a flood defence in a densely populated urban area poses a serious threat to human life. The same event in a less populated rural area may pose a lower risk. Run-off may be polluted with hydrocarbons and other vehicle residues from road surfaces and a potentially wide range of other chemicals from hard surfaces on industrial or agricultural sites.

Flooding from Rivers

- C4. Rivers flood when the amount of water in them exceeds the flow capacity of the river channel. Most rivers have a natural floodplain into which the water spills in times of flood. Flooding can either develop gradually or rapidly according to how steeply the ground rises in the catchment and how fast water runs off into surface watercourses. In a large, relatively flat catchment, flood levels will rise slowly and natural floodplains may remain flooded for several days, acting as the natural regulator of the flow. This is a function that the planning system should promote and enhance. In small, steep catchments, local intense rainfall can result in the rapid onset of deep and fast-flowing flooding with little warning. Such “flash” flooding, which may only last a few hours, can cause considerable damage and possible threat to life. Land use, topography and the form of local development can have a strong influence on the velocity and volume of water and its direction of flow at particular points. Flooding can occur when culverts and bridges are blocked by debris.

Flooding from the Sea

- C5. Flooding to low-lying land from the sea and tidal estuaries is caused by storm surges and high tides. Where tidal defences exist, they can be overtopped or breached during a severe storm, which may be more likely with climate change. The onset of flooding from the sea can be extremely rapid. Deep, fast-flowing water can create an extreme hazard. The severity of such flooding will depend on a number of factors, often in combination: the height of tides; weather systems; wind and wave conditions; topography; the effectiveness of drainage systems; and the condition of flood defences. The consequences and impacts of flooding

from the sea and tidal waters are more severe than flooding from rivers. It is for this reason that Flood Zone 3a (see Table D.1, Annex D) has a 0.5 per cent annual probability boundary for flooding from the sea and tidal waters while from rivers it has a 1.0 per cent annual probability boundary.

Flooding from Land

- C6. Intense rainfall, often of short duration, that is unable to soak into the ground or enter drainage systems can run quickly off land and result in local flooding. In developed areas, this flood water can be polluted with domestic sewage where foul sewers surcharge and overflow. Local topography and built form can have a strong influence on the direction and depth of flow. The design of development down to a micro-level can influence or exacerbate this. Overland flow paths should be taken into account in spatial planning for urban developments. Flooding can be exacerbated if development increases the percentage of impervious area.

Flooding from Groundwater

- C7. Groundwater flooding occurs when water levels in the ground rise above surface elevations. It is most likely to occur in low-lying areas underlain by permeable rocks (aquifers). These may be extensive, regional aquifers, such as Chalk or sandstone, or may be localised sands or river gravels in valley bottoms underlain by less permeable rocks. Water levels below the ground rise during wet winter months, and fall again in the summer as water flows out into rivers. In very wet winters, rising water levels may lead to the flooding of normally dry land, as well as reactivating flow in 'bournes' – intermittent streams that only flow for part of the time, when groundwater levels are high. The Chalk shows some of the largest seasonal variations in groundwater level, and is the most extensive source of groundwater flooding. Groundwater flooding may take weeks or months to dissipate because groundwater flow is much slower than surface flow and water levels thus take much longer to fall.

Flooding from Sewers

- C8. In urban areas, rainwater is frequently drained into surface water sewers or sewers containing both surface and waste water known as "combined sewers". Flooding can result when the sewer is overwhelmed by heavy rainfall, becomes blocked or is of inadequate capacity, and will continue until the water drains away. When this happens to combined sewers, there is a high risk of land and property flooding with water contaminated with raw sewage as well as pollution of rivers due to discharge from combined sewer overflows.

Flooding from Reservoirs, Canals and Other Artificial Sources

- C9. Non-natural or artificial sources of flooding can include reservoirs, canals and lakes where water is retained above natural ground level, operational and redundant industrial processes including mining, quarrying and sand and gravel extraction, as they may increase floodwater depths and velocities in adjacent areas. The potential effects of flood risk management infrastructure and other structures also need to be considered. Reservoir or canal flooding may occur as a result of the facility being overwhelmed and/or as a result of dam or bank failure. The latter can happen suddenly resulting in rapidly flowing, deep water that can cause significant threat to life and major property damage. Industrial flooding can also occur when pumping ceases and groundwater returns to its natural level, for example in former mineral workings and urban areas where industrial water abstraction is reduced from its former rate. Some of this flooding may be contaminated.

Annex D: The Sequential Test and Exception Test

The Sequential Test

- D1. The risk-based Sequential Test should be applied at all stages of planning. Its aim is to steer new development to areas at the lowest probability of flooding (Zone 1).
- D2. The Flood Zones are the starting point for the sequential approach. Zones 2 and 3 are shown on the Environment Agency Flood Map¹⁸ with Flood Zone 1 being all the land falling outside Zones 2 and 3. These Flood Zones refer to the probability of sea and river flooding only, ignoring the presence of existing defences.
- D3. Regional Flood Risk Appraisals (RFRAs) (see Annex E) will refer to Environment Agency Flood Maps and will utilise further information such as Strategic Flood Risk Assessments to allow flood risk to be taken into account in a broad regional context (see Annex E para. E4).
- D4. Strategic Flood Risk Assessments (SFRAs) (see Annex E) will refine information on the probability of flooding, taking other sources of flooding (see Annex C) and the impacts of climate change into account. The SFRA will provide the basis for applying the Sequential Test, on the basis of the Zones in Table D.1. Where Table D.1 indicates the need to apply the Exception Test, the scope of the SFRA will be widened to consider the impact of the flood risk management infrastructure on the frequency, impact, speed of onset, depth and velocity of flooding within the Flood Zones considering a range of flood risk management maintenance scenarios. Where a SFRA is not available, the Sequential Test will be based on the Environment Agency Flood Zones.
- D5. The overall aim of decision-makers should be to steer new development to Flood Zone 1. Where there are no reasonably available sites in Flood Zone 1, decision-makers identifying broad locations for development and infrastructure, allocating land in spatial plans or determining applications for development at any particular location should take into account the flood risk vulnerability of land uses and consider reasonably available sites in Flood Zone 2, applying the Exception Test if required. Only where there are no reasonably available sites in Flood Zones 1 or 2 should decision-makers consider the suitability of sites in Flood Zone 3, taking into account the flood risk vulnerability of land uses and applying the Exception Test if required.
- D6. Within each Flood Zone, new development should be directed first to sites at the lowest probability of flooding and the flood vulnerability of the intended use matched to the flood risk of the site, eg higher vulnerability uses located on parts of the site at lowest probability of flooding.

¹⁸ See website for further details on Flood Map. www.environment-agency.gov.uk/maps/info/floodmaps/?lang=_e

- D7. The preparation and review of Regional Spatial Strategies (RSSs) and Local Development Documents (LDDs) should be used to review existing and proposed development in order to allocate land in lower flood risk zones suitable for existing vulnerable uses already in medium and high flood zones, and in doing so, to realise opportunities arising through redevelopment to improve the sustainability of communities.
- D8. When seeking planning permission for individual developments on sites allocated in development plans through the application of the Sequential Test, informed by a SFRA, developers need not apply the Sequential Test, but should apply the sequential approach (see para. 14) to locating development within the site. The plan should specify requirements for Flood Risk Assessment (see Annex E).

Table D.1: Flood Zones

(Note: These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences)

Zone 1 Low Probability

Definition

This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%).

Appropriate uses

All uses of land are appropriate in this zone.

FRA requirements

For development proposals on sites comprising one hectare or above the vulnerability to flooding from other sources as well as from river and sea flooding, and the potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the new development on surface water run-off, should be incorporated in a FRA. This need only be brief unless the factors above or other local considerations require particular attention. See Annex E for minimum requirements.

Policy aims

In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development, and the appropriate application of sustainable drainage techniques.

Table D.1: contd.

Zone 2 Medium Probability

Definition

This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% – 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% – 0.1%) in any year.

Appropriate uses

The water-compatible, less vulnerable and more vulnerable uses of land and essential infrastructure in Table D.2 are appropriate in this zone.

Subject to the Sequential Test being applied, the highly vulnerable uses in Table D.2 are only appropriate in this zone if the Exception Test (see para. D.9.) is passed.

FRA requirements

All development proposals in this zone should be accompanied by a FRA. See Annex E for minimum requirements.

Policy aims

In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area through the layout and form of the development, and the appropriate application of sustainable drainage techniques.

Zone 3a High Probability

Definition

This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

Appropriate uses

The water-compatible and less vulnerable uses of land in Table D.2 are appropriate in this zone.

The highly vulnerable uses in Table D.2 should not be permitted in this zone.

The more vulnerable and essential infrastructure uses in Table D.2 should only be permitted in this zone if the Exception Test (see para. D.9) is passed. Essential infrastructure permitted in this zone should be designed and constructed to remain operational and safe for users in times of flood.

FRA requirements

All development proposals in this zone should be accompanied by a FRA. See Annex E for minimum requirements.

Table D.1: contd.

Zone 3a High Probability (*continued*)

Policy aims

In this zone, developers and local authorities should seek opportunities to:

- i. reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage techniques;
- ii. relocate existing development to land in zones with a lower probability of flooding; and
- iii. create space for flooding to occur by restoring functional floodplain and flood flow pathways and by identifying, allocating and safeguarding open space for flood storage.

Zone 3b The Functional Floodplain

Definition

This zone comprises land where water has to flow or be stored in times of flood. SFRAs should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the LPA and the Environment Agency, including water conveyance routes).

Appropriate uses

Only the water-compatible uses and the essential infrastructure listed in Table D.2 that has to be there should be permitted in this zone. It should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows; and
- not increase flood risk elsewhere.

Essential infrastructure in this zone should pass the Exception Test.

FRA requirements

All development proposals in this zone should be accompanied by a FRA. See Annex E for minimum requirements.

Policy aims

In this zone, developers and local authorities should seek opportunities to:

- i. reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage techniques; and
- ii. relocate existing development to land with a lower probability of flooding.

Table D.2: Flood Risk Vulnerability Classification

Essential Infrastructure	<ul style="list-style-type: none"> • Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk, and strategic utility infrastructure, including electricity generating power stations and grid and primary substations.
Highly Vulnerable	<ul style="list-style-type: none"> • Police stations, Ambulance stations and Fire stations and Command Centres and telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent.¹⁹
More Vulnerable	<ul style="list-style-type: none"> • Hospitals. • Residential institutions such as residential care homes, children’s homes, social services homes, prisons and hostels. • Buildings used for: dwelling houses; student halls of residence; drinking establishments; nightclubs; and hotels. • Non–residential uses for health services, nurseries and educational establishments. • Landfill and sites used for waste management facilities for hazardous waste.²⁰ • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable	<ul style="list-style-type: none"> • Buildings used for: shops; financial, professional and other services; restaurants and cafes; hot food takeaways; offices; general industry; storage and distribution; non–residential institutions not included in ‘more vulnerable’; and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment plants. • Sewage treatment plants (if adequate pollution control measures are in place).

¹⁹ DETR Circular 04/00 – para. 18: *Planning controls for hazardous substances*. www.communities.gov.uk/index.asp?id=1144377

²⁰ See *Planning for Sustainable Waste Management: Companion Guide to Planning Policy Statement 10* for definition. www.communities.gov.uk/index.asp?id=1500757

Table D.2: contd.

Water-compatible Development	<ul style="list-style-type: none"> • Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel workings. • Docks, marinas and wharves. • Navigation facilities. • MOD defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.
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Notes:

- 1) This classification is based partly on Defra/Environment Agency research on Flood Risks to People (FD2321/TR2)²¹ and also on the need of some uses to keep functioning during flooding.
- 2) Buildings that combine a mixture of uses should be placed into the higher of the relevant classes of flood risk sensitivity. Developments that allow uses to be distributed over the site may fall within several classes of flood risk sensitivity.
- 3) The impact of a flood on the particular uses identified within this flood risk vulnerability classification will vary within each vulnerability class. Therefore, the flood risk management infrastructure and other risk mitigation measures needed to ensure the development is safe may differ between uses within a particular vulnerability classification.

²¹ See website for further details. www.defra.gov.uk/science/Project_Data/DocumentLibrary/FD2320_3364_TRP.pdf

Table D.3²²: Flood Risk Vulnerability and Flood Zone ‘Compatibility’

Flood Risk Vulnerability classification (see Table D2)		Essential Infrastructure	Water compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone (see Table D.1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	✗	Exception Test required	✓
	Zone 3b ‘Functional Floodplain’	Exception Test required	✓	✗	✗	✗

Key:

- ✓ Development is appropriate
- ✗ Development should not be permitted

The Exception Test

D9. For the Exception Test to be passed:

- a) it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a SFRA where one has been prepared. If the DPD has reached the ‘submission’ stage – see Figure 4 of PPS12: *Local Development Frameworks* – the benefits of the development should contribute to the Core Strategy’s Sustainability Appraisal;
- b) the development should be on developable²³ previously-developed land or, if it is not on previously developed land²⁴, that there are no reasonable alternative sites on developable previously-developed land; and
- c) a FRA must demonstrate that the development will be safe, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

²² This table does not show: the application of the Sequential Test which guides development to FZ1 first, then FZ2, and then FZ3; FRA requirements; or the policy aims for each Flood Zone.

²³ Developable sites are defined in Planning Policy Statement 3 (PPS3) *Housing* as those sites which should be in a suitable location for housing development and there should be a reasonable prospect that the site is available for, and could be developed at the point envisaged.

²⁴ Previously-developed land definition (commonly known as Brownfield Land). See Annex B of Planning Policy Statement 3 *Housing*.

- D10. The Exception Test should be applied by decision-makers only after the Sequential Test has been applied and in the circumstances shown in Table D.1 when ‘more vulnerable’ development and ‘essential infrastructure’ cannot be located in Zones 1 or 2 and ‘highly vulnerable’ development cannot be located in Zone 1. It should not be used to justify ‘highly vulnerable’ development in Flood Zone 3a, or ‘less vulnerable’; ‘more vulnerable’; and ‘highly vulnerable’ development in Flood Zone 3b.
- D11. The Exception Test should be applied to LDD site allocations for development and used to draft criteria-based policies against which to consider planning applications. Where application of the Sequential Test indicates it needs to be applied, this should be done as early in the plan-making process as possible – in LDDs, including Supplementary Planning Documents (such as site development briefs). This will minimise the need to apply it to individual planning applications.
- D12. Where the Exception Test has been applied in LDD allocations or criteria-based policies, the local planning authority should include policies in its LDDs to ensure that the developer’s FRA satisfies criterion c) in para. D9. The Environment Agency and other appropriate operating authorities such as Internal Drainage Boards should be consulted on the drafting of any policy intended to apply the Exception Test at a local level.
- D13. Compliance with each part of the Exception Test should be demonstrated in an open and transparent way.
- D14. Criterion b) of para. D9 reflects the Government’s commitment to making the most efficient and effective use of land in line with the principles of sustainable development. Reflecting this, Planning Policy Statement 3 (PPS3): *Housing*²⁵ sets out the Government’s objectives for a flexible, responsive supply of land for housing which gives priority to the use of previously-developed land for development. However, flood risk should be taken into account in determining the suitability of the land for development.

Minor Development and Changes of Use

- D15. Applications for minor development²⁶ and changes of use should not be subject to the Sequential or Exception Tests but will still have to meet the requirements for FRAs and flood risk reduction set out in Table D.1.
- D16. Minor developments are unlikely to raise significant flood risk issues unless they would:
- a) have an adverse effect on a watercourse, floodplain or its flood defences;
 - b) would impede access to flood defence and management facilities; or
 - c) where the cumulative impact of such developments would have a significant effect on local flood storage capacity or flood flows.

²⁵ Communities and Local Government 2006 *Planning Policy Statement 3 (PPS3): Housing* www.communities.gov.uk/index.asp?id=1504592

²⁶ For definitions of minor development see footnote 7

- D17. Developers should refer to Environment Agency's Standing Advice²⁷ for requirements regarding a FRA before designing their development and such extensions or alterations should be designed and constructed to conform to any flood protection already incorporated in the property being extended and should include flood resilience measures in the design.

Removal of Permitted Development Rights

- D18. Where permitted development (that is, development granted a general planning permission by the Secretary of State) threatens to have a direct, significant and adverse effect on a flood risk area, or its flood defences and their access, or the permeability and management of surface water, or flood risk to occupants, the local planning authority should consider whether to make a direction under article 4 of the Town and Country Planning (General Permitted Development) Order 1995 (S.I. 1995/418). An article 4 direction would require a planning application to be made for specific permission to carry out the development. This would enable the local planning authority to assess the possible impacts of the works or change of land-use, and decide whether to grant permission, if necessary subject to conditions, or refuse it.

Caravans and Camping; Chalets and Mobile Homes (including Gypsy and Traveller Sites)

- D19. Land used for holiday or short-let caravans and camping, other temporary occupancy sites and permanently occupied caravan, mobile home and 'park home' sites that use similar structures give rise to special problems in relation to flooding. Caravan or park-home sites intended for permanent occupation are regarded as 'highly vulnerable'. The instability of such structures places their occupants at special risk and they are likely to be occupied during periods when flood risk is likely to be higher.
- D20. Sites intended for temporary occupation are classified as 'more vulnerable' because they are usually occupied at times of the year when flood events are less likely to occur, although they may be located for amenity and recreational reasons on coastal or riverside sites with a high residual risk of flooding. However, the attractiveness of waterside sites for holiday accommodation also has to be recognised, provided that proper warning and evacuation arrangements are put in place through appropriate planning conditions.
- D21. In either case, the Sequential Test and Exception Test should be used by decision-makers (where applicable, – remembering that 'highly vulnerable' development should not be permitted in Zones 3a and 3b and 'more vulnerable' development should not be permitted in Zone 3b). FRAs should pay particular attention to the management of residual risk, flood warning arrangements and evacuation plans should be considered (see Annex G).

²⁷ The Environment Agency's Flood Risk Standing Advice (www.environment-agency.gov.uk) enables local planning authorities to clearly identify which applications they should consult the Environment Agency on and make decisions on low risk planning applications where, for example, flood risk is an issue, without directly consulting the Environment Agency for an individual response.

Annex E: The Assessment of Flood Risk

General Principles

- E1. Properly prepared assessments of flood risk will inform the decision-making process at all stages of development planning. There should be iteration between the different levels of flood risk assessment.
- E2. Any organisation or person proposing a development must consider whether that development will not add to and should where practicable reduce flood risk. The future users of the development must not be placed in danger from flood hazards and should remain safe throughout the lifetime of the plan or proposed development and land use.
- E3. At all stages of the planning process, the minimum requirements for flood risk assessments are that they should:
 - be proportionate to the risk and appropriate to the scale, nature and location of the development;
 - consider the risk of flooding arising from the development in addition to the risk of flooding to the development;
 - take the impacts of climate change into account (see Annex B);
 - be undertaken by competent people, as early as possible in the particular planning process, to avoid misplaced effort and raising landowner expectations where land is unsuitable for development;
 - consider both the potential adverse and beneficial effects of flood risk management infrastructure including raised defences, flow channels, flood storage areas and other artificial features together with the consequences of their failure;
 - consider the vulnerability of those that could occupy and use the development, taking account of the Sequential and Exception Tests and the vulnerability classification (see Annex D), including arrangements for safe access;
 - consider and quantify the different types of flooding (whether from natural and human sources and including joint and cumulative effects) and identify flood risk reduction measures, so that assessments are fit for the purpose of the decisions being made;
 - consider the effects of a range of flooding events including extreme events on people, property, the natural and historic environment and river and coastal processes;
 - include the assessment of the remaining (known as ‘residual’) risk (see Annex G) after risk reduction measures have been taken into account and demonstrate that this is acceptable for the particular development or land use;
 - consider how the ability of water to soak into the ground may change with development, along with how the proposed layout of development may affect drainage systems; and
 - be supported by appropriate data and information, including historical information on previous events.

Regional Flood Risk Appraisals (RFRAs)

- E4. Regional Planning Bodies should prepare RFRAs in consultation with the Environment Agency to inform their Regional Spatial Strategies (RSSs) on flood risk issues. By undertaking a strategic analysis of flood risk, RFRAs should inform RSS consideration of regionally significant uses, including the identification of broad locations and establishing locational criteria to highlight flooding issues that local planning authorities should address through their SFRAs. RFRAs should be informed by the Flood Map and appropriate plans prepared by the Environment Agency and other operating authorities (such as River Basin Management Plans, Catchment Flood Management Plans and Shoreline Management Plans). A RFRA should be used to inform the Sustainability Appraisal (incorporating the SEA Directive) of the RSS.

Strategic Flood Risk Assessments (SFRAs)

- E5. Local planning authorities (LPAs) and other decision-makers should prepare SFRAs in consultation with the Environment Agency, LPAs own functions of emergency response and drainage authority under the Land Drainage Act 1991, and where appropriate Internal Drainage Boards. Initially the SFRA will be used to refine information on the areas that may flood, taking into account other sources of flooding (see Annex C) and the impacts of climate change, in addition to the information on the Flood Map. Decision-makers should use the SFRA to inform their knowledge of flooding, refine the information on the Flood Map and determine the variations in flood risk from all sources of flooding across and from their area. These should form the basis for preparing appropriate policies for flood risk management for these areas. The SFRA should be used to inform the Sustainability Appraisal (incorporating the SEA Directive) of the Local Development Documents (LDDs), and will provide the basis from which to apply the Sequential Test and Exception Test in the development allocation and development control process (see Annex D).
- E6. Where decision-makers have been unable to allocate all proposed development and infrastructure in accordance with the Sequential Test, taking account of the flood vulnerability category of the intended use, it will be necessary to increase the scope of the SFRA to provide the information necessary for application of the Exception Test. This should additionally, consider the beneficial effects of flood risk management infrastructure in generally reducing the extent and severity of flooding when compared to the Flood Zones on the Flood Map. The increased scope of the SFRA will enable the production of mapping showing flood outlines for different probabilities, impact, speed of onset, depth and velocity variance of flooding taking account of the presence and likely performance of flood risk management infrastructure.

- E7. There may be considerable benefits in several LPAs, within a catchment area of high development pressure or a designated development area, joining together to undertake a sub-regional Strategic Flood Risk Assessment. This will help LPAs to consider the issues raised by flooding on the wider scale (of the river catchment and/or coastal cell). This will enable them to contribute to, and take account of, the River Basin Management Plans required to be published by 2009 by the Environment Agency as part of the implementation of the EC Water Framework Directive.

Site-specific Flood Risk Assessments (FRAs)

- E8. At the planning application stage, an appropriate FRA will be required to demonstrate how flood risk from all sources of flooding to the development itself and flood risk to others will be managed now and taking climate change into account. Policies in LDDs should require FRAs to be submitted with planning applications in areas of flood risk identified in the plan.
- E9. Planning applications for development proposals of 1 hectare or greater in Flood Zone 1 and all proposals for new development located in Flood Zones 2 and 3 (see Table D.1, Annex D) should be accompanied by a FRA. This should identify and assess the risks of all forms of flooding to and from the development and demonstrate how these flood risks will be managed, taking climate change into account. For major developments in Flood Zone 1, the FRA should identify opportunities to reduce the probability and consequences of flooding. A FRA will also be required where the proposed development or change of use to a more vulnerable class may be subject to other sources of flooding (see Annex C) or where the Environment Agency, Internal Drainage Board and/or other bodies have indicated that there may be drainage problems.
- E10. The FRA should be prepared by the developer in consultation with the LPA. The FRA should form part of an Environmental Statement when one is required by the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 as amended.

Annex F: Managing Surface Water

- F1. Flooding results both from sources external to the development site and rain falling onto and around the site. The sustainable management of this rainfall, described as surface water, is an essential element of reducing future flood risk to both the site and its surroundings. Assessment of surface water and drainage will be required as part of a FRA.

Drainage Systems

- F2. Undeveloped sites generally rely on natural drainage to convey or absorb rainfall, the water either soaking into the ground or flowing across the surface into watercourses, providing a natural flow of environmental and ecological benefit. Sites currently or previously used for agricultural purposes may additionally have systems of underground drainage pipes as well as open ditches and watercourses.

The Effect of Development

- F3. The effect of development is generally to reduce the permeability of at least part of the site. This markedly changes the site's response to rainfall. Without specific measures, the volume of water that runs off the site and the peak run-off flow rate is likely to increase. Inadequate surface water drainage arrangements in new development can threaten the development itself and increase the risk of flooding to others.
- F4. To satisfactorily manage flood risk in new development, appropriate surface water drainage arrangements are required, to manage surface water and the impact of the natural water cycle on people and property.
- F5. The effective disposal of surface water from development is a material planning consideration in determining proposals for the development and use of land. It will always be much more effective to manage surface water flooding at and from new development early in the land acquisition and design process rather than to resolve problems after development. Site layout should be influenced by the topography. The location of buildings where surface water may flow naturally, or as a result of development, under extreme circumstances should be avoided if possible.
- F6. Surface water arising from a developed site should, as far as is practicable, be managed in a sustainable manner to mimic the surface water flows arising from the site prior to the proposed development, while reducing the flood risk to the site itself and elsewhere, taking climate change into account. This should be demonstrated as part of the flood risk assessment.

Surface Water Drainage and Sustainable Drainage Systems (SUDS)

- F7. The term Sustainable Drainage Systems (SUDS) is frequently used and taken in this PPS to cover the whole range of sustainable approaches to surface water drainage management including:
- source control measures including rainwater recycling and drainage;
 - infiltration devices to allow water to soak into the ground, that can include individual soakaways and communal facilities;
 - filter strips and swales, which are vegetated features that hold and drain water downhill mimicking natural drainage patterns;
 - filter drains and porous pavements to allow rainwater and run-off to infiltrate into permeable material below ground and provide storage if needed; and
 - basins and ponds to hold excess water after rain and allow controlled discharge that avoids flooding.
- F8. Regional planning bodies and local authorities should promote the use of SUDS for the management of run-off.²⁸ Local planning authorities (LPAs) should ensure that their policies and decisions on applications support and complement Building Regulations²⁹ on sustainable rainwater drainage. These give priority to the use of infiltration drainage systems over first watercourses and then sewers.
- F9. Site layout and surface water drainage systems should cope with events that exceed the design capacity of the system, so that excess water can be safely stored on or conveyed from the site without adverse impacts.
- F10. The surface water drainage arrangements for any development site should be such that the volumes and peak flow rates of surface water leaving a developed site are no greater than the rates prior to the proposed development, unless specific off-site arrangements are made and result in the same net effect.
- F11. For new development, it may be necessary to provide surface water storage and infiltration to limit and reduce both the peak rate of discharge from the site and the total volume discharged from the site. There may be circumstances where it is appropriate for infiltration attenuation storage to be provided outside the development site, if necessary through the use of a Section 106 agreement.
- F12. It is essential that the ownership and responsibility for maintenance of every sustainable drainage element is clear; the scope for dispute kept to a minimum; and durable, long-term accountable arrangements made, such as management companies. These issues should be addressed as part of the FRA. Where the surface water system is provided solely to serve any particular development, the construction and ongoing maintenance costs should be fully funded by the developer. Section 106 agreements³⁰ may be appropriate to secure this.

²⁸ ODPM, 2005. *Planning Policy Statement 1: Delivering Sustainable Development* para. 22 website: www.communities.gov.uk/index.asp?id=1143804

²⁹ Building Regulations 2000. Approved Document H: H3 *Rainwater Drainage* website: www.planningportal.gov.uk/approveddocuments

³⁰ *Town and Country Planning Act 1990* available at www.opsi.gov.uk/ACTS/acts1990/Ukpga_19900008_en_1.htm

- F13. LPAs should work closely with the Environment Agency, Internal Drainage Boards, sewerage undertakers, navigation authorities and prospective developers to enable surface water run-off to be managed as near to its source as possible. Other organisations including highway authorities and water companies should be involved as appropriate.
- F14. RPBs and LPAs should further the use of SUDS by:
- incorporating favourable policies within Regional Spatial Strategies;
 - adopting policies for incorporating SUDS requirements in Local Development Documents;
 - encouraging developers to utilise SUDS wherever practicable in the design of development, if necessary through the use of appropriate planning conditions or by planning agreements;
 - developing joint strategies with sewerage undertakers and the Environment Agency to further encourage the use of SUDS as an aid to mitigating the rate and volume of surface water flows; and
 - promoting the use of SUDS to achieve wider benefits such as sustainable development, water quality, biodiversity and local amenity.

Annex G: Managing Residual Flood Risk

- G1. The risks remaining after applying the sequential approach and taking mitigating actions are known as the residual risks. It is the responsibility of those planning development to fully assess flood risk, propose measures to mitigate it and demonstrate that any residual risks can be safely managed. Flood resistance and resilience measures should not be used to justify development in inappropriate locations.

Development Behind Existing Defences

- G2. Following application of the Sequential Test and Exception Test (see Annex D), development should not normally be permitted where flood defences, properly maintained and in combination with agreed warning and evacuation arrangements, would not provide an acceptable standard of safety taking into account climate change. Low-lying tidal and coastal areas are particularly vulnerable, due to the residual risk of defences being overtopped or breached, resulting in fast flowing and deep water flooding. Planning authorities should take these hazards fully into account when drafting Local Development Documents (LDDs) and considering planning applications, recognising that the Environment Agency is not obliged to maintain defences. Risks will be greatest close to such defences, and local planning authorities should seek opportunities to set back developments. Planning authorities should take into account the need for access to maintain defences when considering planning applications in areas close to them.

Other Infrastructure Acting as a Flood Defence

- G3. Road and rail embankments and other existing transport infrastructure can affect water flows during floods. It is important that this is recognised, and where use of such infrastructure is proposed for flood management purposes, this is discussed with the infrastructure owners. Where new transport infrastructure is proposed, the possibility of building-in flood management measures at the design stage should be considered.

Developer Contributions

- G4. In certain circumstances, to meet the wider aims of sustainable development, it may be necessary to permit development that requires the provision of flood risk management, including defence and mitigation works. Such provision will generally be funded by the developer, and is only acceptable provided it is consistent with the relevant flood-risk management policies, passes the Sequential and Exception Tests and does not have a significant adverse impact on flood flows or storage. LDDs should include general policies about the principles and use of planning obligations for flood risk management.

- G5. Where flood risk management works are required to mitigate the risk of flooding to a proposed development or increased risk at other locations, planning authorities and developers should have regard to the following considerations regarding the contributions developers should make:
- developers cannot normally call on public resources to provide defences and other measures for their proposed developments where they are not already programmed for the protection of existing development;
 - where previously programmed defences and other measures have already been provided at public expense to protect existing development, these may also provide opportunities for new development, provided this does not itself add to flood risk at other locations;
 - for some previously developed land, public investment in land remediation and infrastructure may include an element of flood defence and mitigation investment as a means of bringing such land into beneficial use;
 - where the two preceding considerations do not apply but where other material considerations outweigh the risk of flooding, any necessary flood risk management, including defences or flood alleviation works required because of the development or which form a part of that development should normally be fully funded by the developer;
 - authorities may wish to consider entering into an agreement under Section 106 of the Town and Country Planning Act 1990³¹ to ensure that the developer carries out the necessary works and that future maintenance commitments are met. They may also apply planning conditions which would require completion of the necessary works before the rest of the development can proceed;
 - it may be appropriate to vest the resulting flood risk management measures, which have been constructed to the operating authority's satisfaction, in the operating authority, with a dedicated commuted sum to fully fund whole life maintenance and future climate change adaptability costs;
 - where such works would provide a wider benefit, the funding provided by developers may be proportional to the benefits to them. For instance, the development might fund the provision of the defences or other measures which would then be vested in and maintained by the operating authority;
 - after application of the above and all other relevant considerations, the local planning authority, having taken advice from the Environment Agency and any other relevant operating authority, should negotiate an appropriate contribution from the developer. If agreement cannot be reached on the provision of that contribution, the application should be refused.

³¹ see footnote 30

Flood Resilience and Resistance

- G6. The sequential approach (para. 14) should be applied to the layout and design of particular developments. More vulnerable uses should be directed to parts of the site at less probability and residual risk of flooding. The lower floors of buildings in areas at medium and high probability of flooding should be reserved for uses consistent with Table D.1 of Annex D. Those proposing development should seek opportunities to use multi-purpose open space for amenity, wildlife habitat and flood storage uses. Opportunities should be taken to lower flood risk by reducing the built footprint of previously-developed sites and using sustainable drainage systems (SUDS).
- G7. Where there is a low probability of limited shallow depth water entry, but not severe inundation to buildings, the use of flood-resilient construction may be considered. Guidance on the resilient construction is being prepared and can be used to support any further requirements of the Building Regulations. Information on this guidance will be placed on the Communities and Local Government and Planning Portal websites.³²
- G8. Flood-resilient buildings are designed to reduce the consequences of flooding and facilitate recovery from the effects of flooding sooner than conventional buildings. This may be achieved through the use of water-resistant materials for floors, walls and fixtures and the siting of electrical controls, cables and appliances at a higher than normal level. If the lowest floor level is raised above the predicted flood level, consideration must be given to providing access for those with restricted mobility. In considering appropriate resilience measures, it will be necessary to plan for specific circumstances and have a clear understanding of the mechanisms that lead to flooding and the nature of the flood risk by undertaking a FRA.
- G9. Flood-resistant construction can prevent entry of water or minimise the amount of water that may enter a building where there is flooding outside. This form of construction should be used with caution and accompanied by resilience measures, as effective flood exclusion may depend on occupiers ensuring some elements, such as barriers to doorways, are put in place and maintained in a good state. Buildings may also be damaged by water pressure or debris being transported by flood water. This may breach flood-excluding elements of the building and permit rapid inundation. Temporary and demountable defences are not normally appropriate for new developments.
- G10. The relative benefits of resilient and resistant construction have been assessed both through risk assessment and the real time testing of model forms of construction. Resilient construction is favoured because it can be achieved more consistently and is less likely to encourage occupiers to remain in buildings that could be inundated by rapidly rising water levels.

³² See www.communities.gov.uk or www.planningportal.gov.uk

- G11. Essential infrastructure which has to be located in flood risk areas (see Annex D) should be designed to remain operational when floods occur.

Flood Warning and Evacuation Plans

- G12. The receipt of and response to warnings of floods is an essential element in the management of the residual risk of flooding. Particular attention should be given to the communication of warnings to vulnerable people including those with impaired hearing or sight and those with restricted mobility. Attention should also be given to the communication of evacuation plans and warnings to transient occupants of camp sites, caravan sites and holiday facilities. Evacuation plans should be in place for those areas at an identified risk of flooding and should take into account that the occupiers are likely to lack local knowledge. The mobility of occupants also needs to be considered. Those proposing developments should take advice from the emergency services when producing an evacuation plan for the development as part of the FRA. Local Resilience Forums (see Annex H) should ensure that flood risk is fully considered as part of their activities, including the resilience of emergency infrastructure required to operate during floods.

Annex H: Roles and Responsibilities of Parties

- H1. This Annex supplements paras. 21–32 of this PPS. It covers key stakeholders who have a role in the planning process and the flood and coastal defence operating organisations.
- H2. Responsibilities are likely to change as the Government’s strategy for flood and coastal erosion risk management (see *Making Space for Water*) is implemented. The First Government Response to the autumn 2004 *Making Space for Water* consultation published in March 2005 included a commitment to extend the strategic role of the Environment Agency to cover sources of flooding other than from rivers, the sea and tides, and its strategic role in relation to coastal erosion risk. The aim is to implement this wider strategic role of the Environment Agency by 2009.
- H3. The Government will also be pursuing a joined-up approach to integrated urban drainage management which will include river, direct rainfall, sewer and groundwater flooding. One of the outcomes of this work will be to provide the public with clarity on the roles and responsibilities of key bodies.

The Department for Environment, Food and Rural Affairs (Defra)

- H4. Defra has overall policy responsibility for flood and coastal erosion risk in England. It funds most of the Environment Agency’s activities in this area and provides grant aid to the other flood and coastal defence operating authorities (local authorities and internal drainage boards) to support their investment in improvement works. Improvement projects funded by Defra, including those of the Environment Agency, must meet specified economic, technical and environmental criteria and achieve an appropriate “priority score” to be eligible for funding. Defra does not build defences, nor direct the authorities on what specific projects to undertake. The works programme to manage risk is driven by the operating authorities (see paras. H14–H19).

Communities and Local Government

- H5. Communities and Local Government is responsible for spatial planning policy and the operation of the planning system in England, which regulates development and the use of land in the public interest. It covers issues related principally to the location, layout and appearance of new development. Design and flood resilience issues not related to external appearance are matters for the Building Regulations also administered by Communities and Local Government.

Government Offices

- H6. Under the Flooding Direction issued in conjunction with this PPS, where a local planning authority is minded to approve a planning application for major development yet there is an Environment Agency objection to it on flood risk grounds, the application must be referred to the appropriate Government Office to consider, on behalf of the Secretary of State, whether it should be called in for determination.

- H7. Government Offices also have a role to scrutinise draft RSSs and LDDs which will include flood risk policies, and may intervene where these are inadequate.

The Highways Authorities

- H8. Local highways authorities have responsibility for managing road drainage from roads on the local road network, in so far as ensuring that drains which are their responsibility are maintained. The Highways Agency is responsible for managing road drainage from the trunk road network in England, including the slip roads to and from trunk roads.

Sewerage Undertakers

- H9. Sewerage undertakers are generally responsible for surface water drainage from development via adopted sewers and in some instances SUDS. They should ensure that Urban Drainage Plans reflect the appropriate Regional Spatial Strategies (RSSs) and Local Development Documents (LDDs) in line with their obligations in the current legislation and their Asset Management Plans (AMPs).

Reservoir Undertakers

- H10. Certain reservoir undertakers will be required to produce emergency contingency plans (Flood Plans), following direction by the Secretary of State under the Reservoirs Act 1975, as amended. This requirement will be introduced following consultation by Defra. The presence of reservoirs and implications for flood risk should be recognised in Regional Flood Risk Appraisals (RFRAs), Strategic Flood Risk Assessments (SFRAs) and Flood Risk Assessments (FRAs). Flood risk assessments should take into account information received from the reservoir undertakers and Flood Plans when they are available and relevant. Where the consequences of dam failure could endanger life, a reservoir has to be designed to cope with floods of greater severity than those where the consequences of failure would have negligible risk to life. It follows that proposed development downstream could have cost implications if it required upgrading works for the reservoir.

Emergency Services and Multi-Agency Emergency Planning

- H11. The Civil Contingencies Act 2004 and associated Regulations sets out an emergency preparedness framework, including planning for and response to emergencies. Local Resilience Forums, which include representatives from the Emergency Services, Local Authorities and the Environment Agency, should ensure that risks from flooding are fully considered, including the resilience of emergency infrastructure that will have to operate during floods. Emergency Services should be consulted during the preparation of LDDs and the consideration of planning applications where emergency evacuation requirements are an issue.

The Insurance Industry

- H12. Developments at risk of flooding may increasingly face difficulties with the cost or availability of insurance. This, in turn, could cause problems for property buyers in obtaining mortgages. In extreme cases, properties might remain unsold, leading to blight. The Association of British Insurers and the Council of Mortgage Lenders will comment on individual proposals on which the Environment Agency object and where there appears to be a high risk. Those proposing development, especially speculative investment, are advised to consult ABI guidance³³ at an early stage in order to understand the insurance industries concerns. The insurance industry may wish to seek to reduce the risk exposure by making appropriate representations about proposals for the location of new development during the preparation of development plans.

The Community

- H13. Community involvement is an essential element in delivering sustainable development and creating sustainable and safe communities.³⁴ The Planning and Compulsory Purchase Act 2004 requires regional planning bodies and local planning authorities to prepare a Statement of Community Involvement, in which they set out their policy on involving their community in preparing RSSs and LDDs and on consulting on planning applications. This should include community engagement on flood risk issues across the wide range of stakeholders including those mentioned above and community groups. The Disability Discrimination Act 2005 and its codes of practice require that disabled people are included in any such engagement.

Operating Authorities

- H14. An operating authority is any body, including the Environment Agency, LPAs and Internal Drainage Boards which has power to make or maintain works for the drainage of land.

The Environment Agency

- H15. The Environment Agency was established by the Environment Act 1995 and is a Non-Departmental Public Body of Defra. It is the principal flood defence operating authority in England. Under the Water Resources Act 1991, the Environment Agency has permissive powers for the management of flood risk arising from designated Main Rivers and the sea. The Environment Agency is also responsible for flood forecasting and flood warning dissemination, and for exercising a general supervision over matters relating to flood defence.

³³ ABI 2003 *Development planning and flood risk* <http://www.abi.org.uk/Display/File/Child/553/ance2.pdf>

³⁴ See footnote 11.

- H16. The Environment Agency is required to arrange for all its flood defence functions (except certain financial ones) to be carried out by Regional Flood Defence Committees (RFDCs) under s106 of the Water Resources Act 1991. In order to carry out these functions, the Environment Agency through the RFDCs has various statutory powers including the following:
- to maintain or improve any watercourses which are designed as Main Rivers;
 - to maintain or improve any sea or tidal defences;
 - to install and operate flood warning equipment;
 - to control actions by riparian owners and occupiers which might interfere with the free flow of watercourses; and
 - to supervise internal drainage boards.
- H17. The RFDCs are required to take an interest in all flood matters in their area and in particular to take decisions about the annual programmes of improvement and maintenance work to be carried out by the Environment Agency.

Local Authorities

- H18. Local authorities have certain permissive powers to undertake flood defence works under the Land Drainage Act 1991 on watercourses which have not been designated as Main Rivers and which are not within Internal Drainage Board areas. There are also over 80 maritime district councils which have powers to protect the land against coastal erosion under the Coastal Protection Act 1949. Local authorities can control the culverting of watercourses under s263 of the Public Health Act 1936.

Internal Drainage Boards

- H19. Internal Drainage Boards (IDBs) are independent bodies, created under various statutes to manage land drainage in areas of special drainage need. These areas include not only agricultural land but also large urban areas. There are over 100 Boards in England, concentrated in the lowland areas of East Anglia, Somerset, Yorkshire and Lincolnshire. Each Board operates within a defined area in which they have permissive powers under the Land Drainage Act 1991 to undertake flood defence works, other than on watercourses that have been designated as 'Main'.

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Appendix 7: Environment Agency Standing Advice

Environment Agency Standing Advice Development and Flood Risk – England March 2007

Welcome to the Environment Agency's Flood Risk Standing Advice for England (PPS25) version 1.0

This revised version of standing advice replaces the previous version 1.1 issued in October 2005 which was based on Planning Policy Guidance Note 25. **Previous versions should no longer be used.** The revised version of standing advice has been developed to reflect recent changes in Government policy and legislation on flood risk in England, in particular:

- The Town and Country Planning (General Development Procedure) (Amendment) (No 2) (England) Order 2006 (GDPO). On the 1st of October 2006 this made the Environment Agency a statutory consultee for planning applications involving flood risk in specified circumstances
- The release of Planning Policy Statement 25; Development and flood risk (PPS25). This replaces the previous Government policy as set out in Planning Policy Guidance Note 25 on Development and Flood Risk (PPG25).
- The Practice Guide which will accompany PPS25.

The Environment Agency has produced standing advice to assist Local Planning Authorities make decisions on low risk planning applications where, whilst flood risk is an issue, there is no need to consult us directly for a bespoke response. The standing advice also sets out those higher risk developments on which we are a statutory consultee on development and flood risk where we need to be consulted directly by Local Planning Authorities. The standing advice also provides advice for applicants and agents on the requirements for flood risk assessment (FRA) for both low and higher risk developments.

This standing advice will be reviewed in light of experience gained working with PPS25 and the PPS25 Practice Guide.

The standing advice contains the following sections:

User flowchart

This comprises two flowcharts to guide users in Local Planning Authorities and applicants/agents to those parts of the standing advice on this web site that will be most relevant to them.

Consultation matrix.

Based on the October 1st 2006 amendment to the GDPO, the consultation matrix sets out when we need to be consulted by Local Planning Authorities together with guidance on what that consultation should contain. The matrix is also linked to standard guidance for lower risk (non-statutory) development.

Sequential Test table

The table provides a framework to guide Local Planning Authorities through the evidence that the Environment Agency will require as a demonstration that the flood risk Sequential Test has been carried out in an open and transparent way. This is to be completed by the Local Planning Authority and submitted to us when we are consulted on planning applications where the Sequential Test applies. Developers may also find the table a useful guide to the information required to support the application of the Sequential Test.

Applicant and agent advice

These pages contain advice for developers and consultants. A simple matrix is linked to advice on low risk development and flood risk assessment guidance for applicants. These pages also contain useful links to other flood risk information and guidance on Environment Agency consents.

Three technical guidance notes on flood risk assessment.

These are accessed through the applicant and agent page listed above. They provide information on the

range of factors that need to be considered when assessing flood risk for various development types, at different scales and locations.

Flood Map

The flood risk constraint mapping that supports the standing advice has been supplied to all Local Authorities under separate cover. Other users can view the Flood Map for England at 1:20,000 scale on the Environment Agency's website <http://www.environment-agency.gov.uk/>

The dark blue area on Flood Map is equivalent to Flood Zone 3 and the light blue area is equivalent to Flood Zone 2 (England only).

If you require Flood Map at a more detailed, site specific scale, this can be obtained by contacting the National Customer Contact Centre on 08708 506 506 or by contacting your local Environment Agency office.

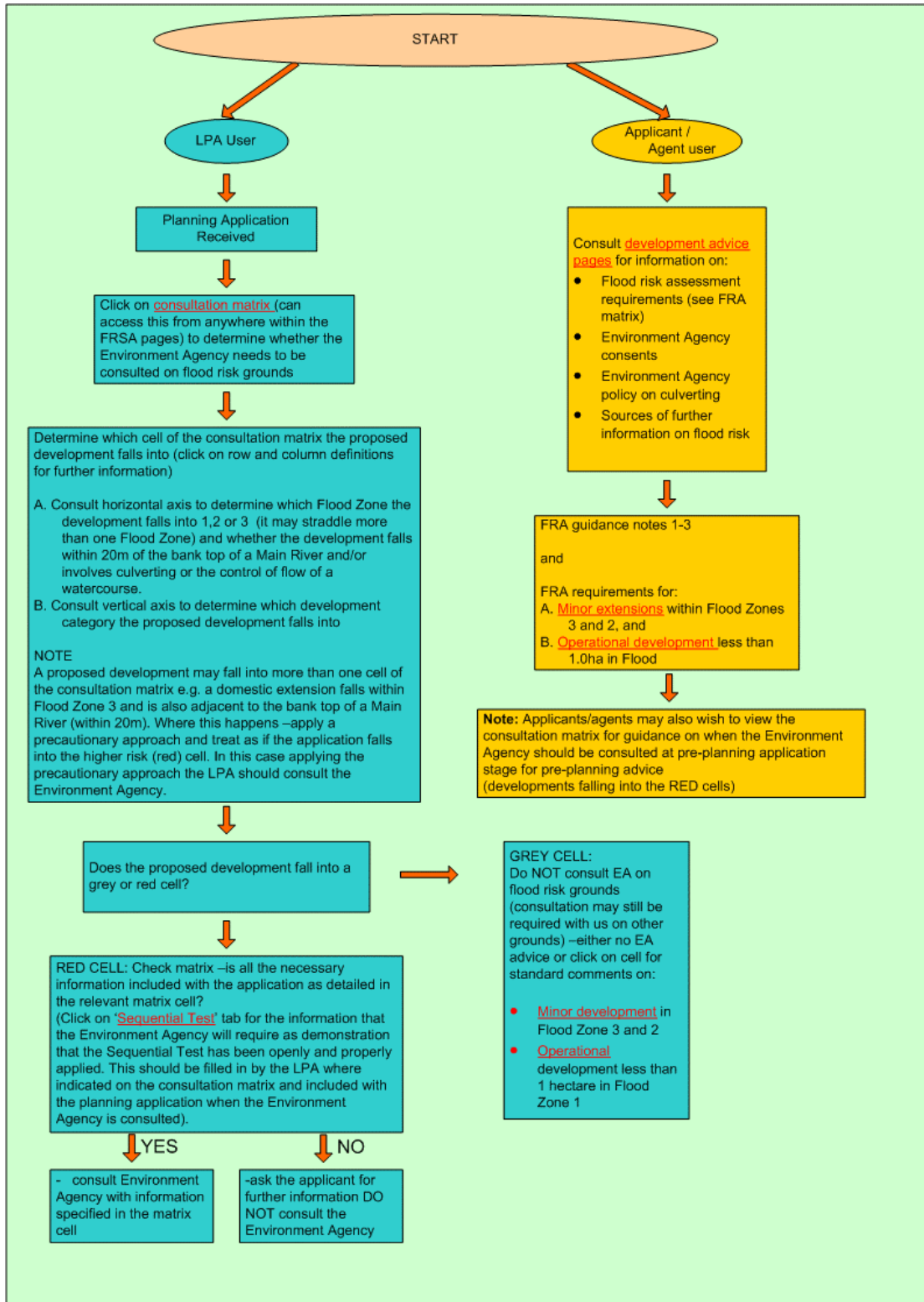
If your organisation requires electronic copies of Flood Zone GIS data sets, please contact the Data and Information Exploitation Unit on 01454 284430 to discuss further, including charging and licensing matters.

Feedback

If you have any comments on the contents of this flood risk standing advice or the format of this System please contact either your local area Planning Liaison team or Paul Wheeler (**email** : paul.wheeler@environment-agency.gov.uk).

Using the standing advice

The contents of this standing advice are valid up to 1st November 2007 unless advised otherwise in writing by the Environment Agency.



**Table 1.1: Environment Agency Flood Risk Standing Advice for England (PPS25)
Version 1.0 – May 2007 (Flood Risk Matrix)**

Development category	Development (including boundary walls etc.) within 20 metres of the top of a bank of a Main River	Includes culverting or control of flow of any river or stream	Within Flood Zone 3	Within Flood Zone 2	Within Flood Zone 1
Householder development and alterations	Consult EA	Consult EA with FRA showing design details of any culvert or flow control structure proposed	No consultation - see standard comment	No consultation - see standard comment	No consultation - No EA Advice
Non-residential extensions with a footprint of less than 250m ²	Consult EA	Consult EA with FRA showing design details of any culvert or flow control structure proposed	No consultation - see standard comment	No consultation - see standard comment	No consultation - No EA Advice
Change of use FROM Water Compatible TO 'Less Vulnerable' development	Only consult EA if site also falls within Flood Zone 3. FRA Required	No consultation - No EA Advice	Consult EA with FRA	No consultation - no EA advice	No consultation - No EA Advice
Change of use RESULTING IN 'Highly Vulnerable' or 'More Vulnerable' development	Only consult EA if site also falls within Flood Zone 3. FRA Required	No consultation - no EA advice	Consult EA with FRA	Consult EA with FRA	No consultation - No EA Advice
Operational development less than 1 hectare	Consult EA	Consult EA with FRA showing design details of any culvert or flow control structure proposed	Consult EA with FRA and Sequential Test Evidence (and where required confirm Exception Test has been applied)	Consult EA with FRA and Sequential Test Evidence (and where required confirm Exception Test has been applied)	No consultation - see standard comment
Operational development of 1 hectare or greater	Consult EA	Consult EA with FRA showing design details of any culvert or flow control structure proposed	Consult EA with FRA and Sequential Test Evidence (and where required confirm Exception Test has been applied)	Consult EA with FRA and Sequential Test Evidence (and where required confirm Exception Test has been applied)	Consult EA with FRA

Table 1: Summary of High Level Target 5 (HLT5)

Target 5 – Development in areas at risk of flooding and coastal erosion	By When	By Whom
<p>A: Flood Risk: Report to Defra and ODPM on:</p> <ul style="list-style-type: none"> • Those local authority development plans upon which the Agency have commented, identifying plans which do, and do not, have flood risk statements or policies; and • The Agency’s response to planning applications, identifying cases where: (i) the Agency sustained objections on flood risk grounds; and (ii) final decisions, either by the LPA or on appeal, were in line with, or contrary to, Agency advice. 	<p>Annually by 30 September for year to previous 31 March</p>	<p>EA (in partnership with local planning authorities)</p>

5.2.1 Evidence for applying the flood risk Sequential Test to planning applications

This table sets out the information that the Environment Agency will require as evidence from Local Planning Authorities as a demonstration that the flood risk Sequential Test (PPS25 paragraphs 16 and 17 and Annex D) has been properly applied. This information may also be presented by applicants to Local Planning Authorities in support of the Sequential Test for an application site.

Note – All developments must be appropriate to the Flood Zone in which they sit. See tables D1 - D3 of PPS25.

Answer the questions in order, moving on where indicated.	Answer Yes or No	Has the Sequential Test been adequately demonstrated?	LPA/ Developer to consult the information sources below.
1. Is the proposed development consistent in location, type and scale with an allocated site from a development plan which has already been sequentially tested (i.e. has the flood risk Sequential Test already been carried out for this site at a strategic level?)	If yes, state which plan, which allocation and the location of the allocation site in the development plan If the answer is 'No' go to question 2	If the answer is Yes compliance with the Sequential Test has been adequately demonstrated FINISH HERE LPA should apply Exception Test if appropriate –see PPS25 Table D3.	Development plan
2. Does the application site fall within an area identified to take 'windfall' development, that has been agreed as part of the development plan and in association with a Strategic Flood Risk Assessment (SFRA)?	If yes, state the location in the development plan If the answer is 'No' or there are no such areas identified on the development plan, go to question 3	If the answer is Yes compliance with the Sequential Test has been adequately demonstrated - FINISH HERE LPA should apply Exception Test if appropriate –see PPS25 Table D3.	Development plan

<p>3. Does the development plan or the background documents used to identify potential development plan allocation sites, contain 'reasonably available' alternative sites that are situated in a lower flood risk zone?</p>	<p>If yes, state which allocation(s) and the location in the development plan. If the answer is 'No' go to question 4</p>	<p>If the answer is Yes, compliance with the Sequential Test has NOT been adequately demonstrated – FINISH HERE</p>	<p>Development plan Background Documents Environment Agency Flood Map</p>
<p>4. Does the development plan or the background documents used to identify potential development plan allocation sites, contain alternative 'reasonably available' sites that are within the same Flood Zone and subject to a lower probability of flooding from all sources as detailed by the SFRA?</p>	<p>If yes, state which allocation(s) and the location in the development plan.</p>	<p>If the answer to Question 4 is Yes, compliance with the Sequential Test has NOT been adequately demonstrated – FINISH HERE If the answer is No to questions 3 and 4 compliance with the Sequential Test has been adequately demonstrated. LPA should apply Exception Test if appropriate –see PPS25 Table D3.</p>	<p>Development plan Background Documents Strategic Flood Risk Assessment</p>

Notes and definitions

Question 1

Development scale - The planning application must not be for a larger site area than was indicated at the allocations stage e.g. through a site brief.

'Pre-Local Development Framework local plans' - Planning applications for sites allocated through development plans that pre-date the Planning and Compulsory Purchase Act 2004 will be subject to the Sequential Test at the planning application stage unless evidence is provided that the plan has been subject to the flood risk Sequential Test. The requirement for plan allocations to be flood risk sequentially tested was first introduced in Planning Policy Guidance note 25:Development and Flood Risk published in July 2001.

Question 2

Windfall development- Proposed development for a site that is not an allocated site in an adopted development plan.

Question 3

Development Plan - The term 'development plan' covers both saved, old style development plans that pre-date the 2004 Planning and Compulsory Purchase Act and new style plans, i.e. Local Development Documents (LDD) or Supplementary Planning Documents produced as part of Local Development Frameworks (LDF) produced since 2004 that have reached the submissions stage.

Background documents -Background study documents are produced by the LPA prior to drafting of the LDDs and include housing and employment land availability assessments and equivalent studies. If these documents are new i.e. have been created to inform the emerging LDF, then it is reasonable to consider the sites they contain as reasonably available alternatives for the purpose of applying the Sequential Test.

Reasonably available alternative site allocations - Any site that has been allocated as part of a development plan and that has yet to receive planning permission should be counted as a reasonably available alternative site for the purpose of applying the Sequential Test. In addition when there is no allocations LDD, reference should be made to any recent background documents (see above) that have been created to inform the emerging LDF. Sites contained within these documents that are yet to receive planning permission should be counted as reasonably available alternatives for the purpose of applying the Sequential Test.

Question 4

Strategic Flood Risk Assessment - A district wide assessment of flood risk from all sources, undertaken by the Local Planning Authority to inform the preparation of its LDD's.

Where a SFRA does not provide the necessary information or is yet to be completed, reference should be made to any available site specific FRAs in the councils' possession. Where flood risk information to answer question 4 is not available, LPAs should move straight into application of the Exception Test where appropriate ¹ (see paragraph 19 of PPS25).

¹ Are there large areas (>50% of land area) of the LPA in Flood Zones 2 and 3 and development is needed to avoid social or economic blight?, Is the proposed development essential civil infrastructure (Table D2) that has to remain operating during flooding?, Are there restrictive international or national landscape / biodiversity / heritage designations (e.g. National Parks, AONBs, SPAs, SACs, SSSIs, World Heritage Sites, Ancient Monuments) that mean there are no unconstrained sites in 'appropriate' Flood Zones?, Does para D10, Table D1 and Table D3 indicate that this development (Flood Zone and Flood Risk Vulnerability) requires the application of the Exception Test before it can be permitted? The answer must be yes to these questions for the Exception test to apply – see paragraphs 18 – 20 of PPS25.

Development Advice for Applicants and Agents

Applicants and their agents should take part in pre-application discussions with both the Local Planning Authority and the Environment Agency. These discussions can assist all parties to mutual benefit by highlighting early on, instances where for example:

- the flood risk Sequential and Exception Tests will be required and is likely to be failed (Note -the Sequential and Exception Tests are not required for 'minor development'¹)
- the development type is inappropriate for the proposed location
- the flood risk to the site is insurmountable
- modifications to a proposal at an early stage will make a development proposal acceptable, before the expense of detailed design has been committed to.

For pre-application discussions with the Environment Agency call 08708 506 506 and ask to speak to the Planning Liaison team in the area where the development is planned.

Planning applications must be accompanied by a flood risk assessment (FRA). The table below sets out the FRA requirements for development based on the size of site and the location within the floodplain. Please note that whilst a FRA is essential for developments falling within the cells as set out below, the provision of a FRA will not automatically make that development acceptable in flood risk terms. When a FRA is submitted to us for consideration, we will still object in cases where we consider that the FRA does not or cannot adequately address the flood risk issues.

	Within Flood Zone 3	Within Flood Zone 2	Within Flood Zone 1
All domestic extensions + non domestic extensions with a footprint of less than 250m ²	Click here for advisory comments	Click here for advisory comments	No Comment
All applications with a site area less than 1ha	Follow the link to FRA guidance note 3	Follow the link to FRA guidance note 3	Click here for advisory comments
All applications with a site area greater than 1ha	Follow the link to FRA guidance note 3	Follow the link to FRA guidance note 3	Follow the link to FRA guidance note 1

Links to further guidance:

1. www.environment-agency.gov.uk For information on SUDS best practice, flood proofing and flood resilient construction methods, flood warning, Flood Map and contact details for local Environment Agency offices.
2. www.ciria.org.uk Check 'publications' for details of relevant information
3. www.ciwem.com/directory/ For information on consulting engineers who may be able to carry out FRAs. This is by no means a definitive list nor should inclusion in this list be taken as Environment Agency endorsement or quality assurance of those parties listed.
4. www.hrwallingford.co.uk For information on an R&D project on flood risk assessment guidance for new development.

Environment Agency Consents that will also be needed:

Works within Main River and flood defence byelaw distance

Development within byelaw distance from the top of the bank of a designated Main River or from the landward toe of a flood defence will require consent from the Environment Agency. Byelaw distances vary across the country. For information on your local byelaw distances please call 08708 506 506 and ask to speak to a member of the Development Control team in the area where the development is planned.

Works to Ordinary watercourses on site

Development which involves a culvert or an obstruction to flow on an Ordinary Watercourse² will require Environment Agency consent under the Land Drainage Act 1991. In the case of an Ordinary Watercourse in an internal drainage district, the consent of the Internal Drainage Board instead of the Environment Agency is required. This is in accordance with Section 23 of the Land Drainage Act 1991.

Applicants may apply to the Environment Agency for consent ahead of submitting a planning application and enclose the consent documentation with their FRA. The LPA will formally consult the Environment Agency regarding any planning application submitted, which involves a culvert or an obstruction to flow on an Ordinary Watercourse

Culverting –Environment Agency policy

The Environment Agency has a [policy on culverting](#) which strongly discourages the creation of new culverts or extensions to existing culverts except where required for essential access purposes. Culverting increases the risk of flooding by restricting the capacity of the channel to cope with increased flows during flood events and presents significant maintenance problems over the longer term with an on-going risk of blockage. The culvert may also need to be repaired or replaced in the future to maintain or increase its capacity. In addition to the flood risks, culverting may damage the ecology of a watercourse, restricting the scope for water-based fauna and flora to survive and inhibiting the movement of fish. Applicants considering culverting are advised to contact us at the earliest possible stage to discuss the feasibility of the proposals and the likelihood of gaining Land Drainage Act consent.

Any diversion should maintain the original watercourse in cross section, long section and in plan.

Whilst our consent is not required for building over an existing culvert on an Ordinary Watercourse, we strongly advise against this. Building over culverts will obstruct any overland flow route, increasing the likelihood of flooding to the development and its neighbours and there could be difficulties in replacing or maintaining culverts in future.

Householder and other minor extensions

The guidance below is designed to cater for domestic extensions as well as the extension of an existing building used for non-domestic purposes where the footprint created by the development does not exceed 250 square metres.

The Environment Agency recommends that:

Applicants complete the table below and include it with the planning application submission. The table, together with the supporting evidence, will form the Flood Risk Assessment (FRA) and will act as an assurance to the Planning Authority that flood risk issues have been addressed as part of the development.

Planning Authorities check the planning application and ensure that one or other of the mitigation measures proposed in the table below has been incorporated into the development

Applicant to choose one or other of the flood mitigation measures below.	Applicant to provide the LPA with the supporting Information detailed below as part of their FRA	Applicant to tick one of the boxes below
<p>Either ;</p> <p>Floor levels within the proposed development will be set no lower than existing levels AND, Flood proofing of the proposed development has been incorporated where appropriate.</p>	<p>Details of any flood resilience and resistance techniques to be included in accordance with 'Preparing for floods' (ODPM 2003)</p>	
<p>Or;</p> <p>Floor levels within the extension will be set 300mm above the known or modelled 1% (1 in 100 chance each year) river flood level or 0.5% (1 in 200 chance each year) tidal & coastal flood level.</p>	<p>This must be demonstrated by a plan that shows finished floor levels relative to the known or modelled flood level.</p> <p>All levels should be stated in relation to Ordnance Datum</p>	

Cumulative impact of minor extensions and the removal of Permitted Development rights. In circumstances where local knowledge (Strategic Flood Risk Assessment held by the LPA/ letters from the parish council etc.) has indicated that the cumulative impact of minor extensions may have a significant effect on flood risk as highlighted in PPS25 paragraph D14, FRA guidance note 2 can be applied.

Operational development less than 1 hectare in Flood Zone 1 - surface water drainage information

For operational developments ¹ of less than 1 hectare site size falling within Flood Zone1, the main flood risk issue to consider will usually be managing surface water run-off. The following is offered as good practice towards sustainable surface water management.

If a known drainage problem exists and the Local Planning Authority would like assurance from the developer that flood risk has been addressed, reference should be made to [FRA note 1](#).

Is the proposal part of a larger development site?

Reserved matters applications in Flood Zone 1 might be part of larger sites, which already have outline permission. In such cases, the Local Planning Authority should ensure that any conditions that were applied to the larger site to manage surface water drainage are taken into account in the reserved matters application, in order to prevent a 'piecemeal' approach to drainage.

Best practice advice-sustainable drainage (SUDS)

Surface water run-off should be controlled as near to its source as possible through a sustainable drainage approach to surface water management (SUDS). SUDS are an approach to managing surface water run-off which seeks to mimic natural drainage systems and retain water on or near the site as opposed to traditional drainage approaches which involve piping water off site as quickly as possible. SUDS involve a range of techniques including soakaways, infiltration trenches, permeable pavements, grassed swales, ponds and wetlands. SUDS offer significant advantages over conventional piped drainage systems in reducing flood risk by attenuating the rate and quantity of surface water run-off from a site, promoting groundwater recharge, and improving water quality and amenity.

Support for the SUDS approach to managing surface water run-off is set out in paragraph 22 of Planning Policy Statement 1 (PPS): Delivering Sustainable Development and in more detail in Planning Policy Statement 25: Development and Flood Risk at Annex F. Paragraph F8 of the Annex notes that "Local Planning Authorities should ensure that their policies and decisions on applications support and complement Building Regulations on sustainable rainwater drainage".

Approved Document Part H of the Building Regulations 2000 establishes a hierarchy for surface water disposal, which encourages a SUDS approach. Under Approved Document Part H the first option for surface water disposal should be the use of SUDS, which encourage infiltration e.g. soakaways or infiltration trenches. In all cases, it must be established that these options are feasible, can be adopted and properly maintained and would not lead to any other environmental problems. For example, using soakaways or other infiltration methods on contaminated land carries groundwater pollution risks and may not work in areas with a high water table. Where the intention is to dispose to soakaway, these should be shown to work through an appropriate assessment carried out under BRE Digest 365.

Flow balancing SUDS methods which involve the retention and controlled release of surface water from a site may be an option for some developments at a scale where uncontrolled surface water flows would otherwise exceed the local greenfield run off rate. Flow balancing should seek to achieve water quality and amenity benefits as well as managing flood risk.

Further information on SUDS can be found in [annex F of PPS 25](#), the PPS25 Practice Guide, in the CIRIA C522 document *Sustainable Urban Drainage Systems-design manual for England and Wales* and the *Interim Code of Practice for Sustainable Drainage Systems*. The Interim Code of Practice provides advice on design, adoption and maintenance issues and a full overview of other technical guidance on SUDS. The Interim Code of Practice is available electronically on both the Environment Agency's web site at: www.environment-agency.gov.uk and CIRIA's web site at: www.ciria.org.uk

Disposal to public sewer

Where it is intended that disposal is made to public sewer, the Water Company or its agents should confirm that there is adequate spare capacity in the existing system taking future development requirements into account

Other flood risk issues to consider for development in Flood Zone 1 - Dry Islands

There are some areas within Flood Zone 1 that are surrounded by areas at a higher risk of flooding i.e. areas falling within Flood Zones 3 and 2. In certain cases development within such 'dry islands' can present particular hazards to public safety and risks such as those risks associated with maintaining safe access and exit for occupants during flood events. The distribution of dry islands and risks posed by them in terms of access/exit vary considerably across the country. If you are in any doubt about how flood risks associated with 'dry islands' may affect your Authority area, please contact your local Environment Agency Planning Liaison team.

FRA Guidance Note 1: Development Greater Than 1 Hectare in Flood Zone 1

Environment Agency guidance on requirements for undertaking a Flood Risk Assessment (FRA) for planning applications. This guidance note principally relates to the commissioning and undertaking of flood risk assessment studies for development greater than 1.0 ha in **Flood Zone 1**¹. It is designed:

- a. to consider the principles of the sustainable drainage of surface water,
- b. for use where works may affect watercourses or flood defences, or
- c. for use where a known drainage problem exists on which the LPA would like assurance from the developer that flood risk has been addressed.

For sites less than 1 hectare in Flood Zone 1, a formal FRA will not usually be required (see Table D1 of Planning Policy Statement 25). In these cases, applicants are advised to refer to the standard comments on managing surface water drainage as set out in our [Standing Advice on Development and Flood Risk](#). However, where (b) and/or (c) above apply, a FRA may still be required for development of less than 1 hectare and this guidance note can be used to inform the FRA.

Why is a FRA required?

In Flood Zone 1, where the risk of flooding from rivers or the sea is classified as low, a Flood Risk Assessment is still required but it should be focused on the management of surface water run-off. Development that increases the amount of impermeable surfaces can result in an increase in surface water run-off, which in turn can result in increased flood risk both on site and elsewhere within the catchment. This is particularly important for larger scale sites, which have the potential to generate large volumes of surface water run-off. The site may also still be at risk from other sources of flooding (e.g. groundwater and overland runoff), which are not considered in the mapping of Flood Zones. Further information is provided in Annex C of PPS25.

What should be in the FRA?

The detail and technical complexity of a flood risk assessment will reflect the scale, nature and location of the development. The following list sets out the kind of information that should be submitted as a FRA for developments of greater than 1ha in Flood Zone 1:

Plans

- A location plan that includes geographical features, street names and identifies the catchment, watercourses or other bodies of water in the vicinity.
- A plan of the site showing:
 - existing site
 - development proposals and
 - identification of any structures, which may influence local flood flow overland or in any watercourses present on the site.

Surveys

- Site levels related to Ordnance Datum, both existing and proposed.

Assessments

The Applicant should submit:

- Information about the surface water disposal measures already in place and their state of maintenance.
- An assessment of the volume of surface water run-off likely to be generated from the proposed development.

- Proposals for surface water management according to sustainable drainage principles, with the aim of not increasing, and where practicable reducing, the rate of runoff from the site as a result of the development.
- Allowance in design for how climate change will affect the probability and intensity of events in the future.
- Information about any other potential sources of flooding that may affect the site – streams, surface water run-off, sewers, groundwater, reservoirs, canals and other artificial sources or any combination of these.
- Information on how these sources of flooding will be managed safely within the development proposal.
- Consideration of the proposal relative to any existing Strategic Flood Risk Assessment carried out by the local authority.
- Confirmation as to whether Environment Agency consent is needed for any aspect of the work, and whether this has been applied for or not.

‘Dry islands’:

An additional issue that may need to be considered for development in Flood Zone 1 is that of ‘dry islands’. These are areas within Flood Zone 1 that are completely surrounded by areas at a higher risk of flooding i.e. areas falling within Flood Zones 3 and 2. In certain cases development within ‘dry islands’ can present particular hazards to public safety and risks such as those risks associated with maintaining a means of safe access and exit for occupants during flood events. The distribution of dry islands and risks posed by them in terms of access/exit vary considerably across the country. If you are in any doubt about how flood risks associated with ‘dry islands’ may affect an area, please contact the Development Control team in the area where the development is planned.

What is the Environment Agency’s Role?

We will usually provide comments at the planning application stage on Flood Risk Assessments covered by this guidance note. We have three main interests:

- Ensuring that the calculation and design of the site drainage system meets the aims of sustainable drainage management, and does not increase, and where practicable reduces, the current runoff from the site.
- If the proposal is within the Byelaw Distance ² of a Main River ³ or flood defence structure, or includes the diversion or culverting of an Ordinary Watercourse ⁴ then formal consent for the proposal may also be required from us.
- Prior to carrying out a FRA, developers should contact the Environment Agency and other operating authorities (including the engineering department of the local authority or Internal Drainage Board as appropriate) to establish whether any information is available relating to flood risk at the site they propose to develop. It should be noted that we only record known problems of this kind and the absence of information does not mean that a site will not flood. Developers should also take full account of the local knowledge of flooding in the community and account for this within the FRA.

Sources of information:

Information on SUDS can be found in the [PPS25 Draft Practice Guide](#) and Appendix F of the PPS. In addition, the CIRIA C522 document Sustainable Urban Drainage Systems-design manual for England and Wales and the Interim Code of Practice for Sustainable Drainage Systems ⁵ give technical guidance on SUDS systems. This Interim Code of Practice provides advice on design, adoption and maintenance issues and a good overview of other technical guidance on SUDS. The Interim Code of Practice is available electronically on both the Environment Agency's web site at: www.environment-agency.gov.uk and CIRIA's web site at: www.ciria.org.uk Note that whilst the focus within the FRA must be on flood risk management, any SUDS should also seek to maximise opportunities for water quality and amenity benefits.

FRA Guidance Note 2: Minor Extensions - For the use where cumulative impact of development needs to be addressed

Environment Agency guidance on the requirements for undertaking a Flood Risk Assessment (FRA) for planning applications. This guidance note relates specifically to the commissioning and undertaking of Flood Risk Assessment studies for householder extensions and for minor non-domestic extensions (of less than 250m²) in Flood Zones 2¹ or 3². This guidance note is applicable where local knowledge (Strategic Flood Risk Assessment, parish council etc.) has indicated that the cumulative impact of minor extensions may have a significant effect on flood risk as highlighted in [Planning Policy Statement 25 \(PPS\) paragraph D16](#).

Where cumulative impact from this type of development in these locations is not a recognised problem, a simpler format of FRA should suffice as detailed in our Flood Risk Standing Advice standard comments on [‘Householder and other minor extensions’](#).

Why is a FRA required?

For minor extensions within Flood Zone 3 and 2 areas the proposed development itself could be at risk of flooding from either rivers or the sea. Where this is the case, a FRA will need to focus on mitigation measures such as setting suitable floor levels and incorporating flood proofing into the design of the extension in addition to including an assessment of residual risks on and off site. Developments immediately alongside watercourses classified as a Main River or in close proximity to flood defence structures may also affect the operation or maintenance of these, and we will expect to comment individually on these proposals³. The FRA in these cases will need to consider these impacts and whether they might be acceptable or not.

What should be in the FRA?

The detail and technical complexity of a Flood Risk Assessment will reflect the scale and potential flood risk to and from the development. Flood Risk Assessments for this scale of development will be of a relatively minor nature and may even just take the form of a short written statement. In the cases covered here, the Strategic Flood Risk Assessment (if available) should highlight which elements of the section below will require particular attention.

Plans

- A location plan that includes geographical features, street names and identifies the catchment, watercourses or other bodies of water in the vicinity
- A plan of the site showing
 - existing site;
 - development proposals;
 - proposed flood protection measures incorporated into the development to reduce flood risk to the development itself and to others.

Surveys

- Site levels related to Ordnance Datum, both existing and proposed.
- A cross-section of the site showing finished floor levels or road levels, or other relevant levels relative to the potential source of flooding.

Assessments

The Applicant should submit:

- Information about any other potential sources of flooding that may affect the site – streams, surface water run-off, sewers, groundwater, reservoirs, canals and other artificial sources or any combination of these
- Existing information on extent and depth of past flood events
- Details of flood mitigation measures proposed to reduce the impact of flooding

- Assessment of the residual risks after any necessary flood proofing measures or defences have been installed.
- The estimated standard of flood protection provided to the development when completed.
- Assessment of the off site impacts due to the effect on local flood storage and flood flow capacity.

What is the Environment Agency's Role?

With the exception of developments immediately alongside Main Rivers and in close proximity to flood defences, we will not provide comments in terms of flood risk on these minor developments at the planning application stage due to their low-risk nature. We have two main interests:

- If the proposal is within the Byelaw Distance⁴ of a Main River⁵ or flood defence structure, or includes the diversion or culverting of an Ordinary Watercourse⁶ then formal consent for the proposal may also be required from us.
- Prior to carrying out a FRA, developers should contact the Environment Agency and other operating authorities (including the engineering department of the local authority or Internal Drainage Board as appropriate) to establish whether any information is available relating to flood risk at the site they propose to develop. Our records of flooding are not exhaustive and the absence of information does not mean that a site will not flood. They should also take full account of the local knowledge of flooding in the community and account for this within the FRA.

FRA Guidance Note 3: Development in Flood Zones 3 and 2 (Excluding Minor Extensions)

Environment Agency guidance on the requirements for undertaking a Flood Risk Assessment (FRA) for planning applications. This guidance note relates specifically to the commissioning and undertaking of flood risk assessment studies for development in Flood Zones 2 and 3 other than 'minor' extensions i.e. excluding householder extensions and non-domestic extensions with a footprint of less than 250m², which are covered separately in FRA guidance note 2.

Prior to investing resources in completing a FRA, applicants are advised to contact the Local Planning Authority (LPA) and discuss how the flood risk Sequential Test as set out in Planning Policy Statement 25 (PPS25) will affect the proposed development. It is possible that the development will be inappropriate and be refused planning permission irrespective of any FRA. Advice on the evidence required to show that the Sequential and Exception Test has been properly applied is set out in the Sequential Test table within the Environment Agency's Standing Advice on development and flood risk and in the draft Practice Guide to PPS25. The Environment Agency may require evidence that the Sequential Test has been properly applied before commenting in detail on FRAs for development in this category.

Why is a FRA required?

In Flood Zone 3, the flood risk from rivers and the sea is classified as 'high', while in Flood Zone 2 it is said to be 'low to medium'. This classification is simply based on the probability of flood events occurring and does not address the possible consequences including the effects of any flood defences in the area. A FRA is required to ensure that all aspects of flood risk are considered both to the proposed development itself and also the potential impact on people and property elsewhere within the catchment. The scale, nature and location of the proposed development will inform the scope of the FRA required.

What should be in the FRA?

The detail and technical complexity of a FRA will reflect the scale and potential significance of the development. FRAs can be of a relatively minor nature, evaluating a small development on a site at the margins of the flood plain, or conversely can comprise major basin-wide studies for significant infrastructure developments. On occasions, preliminary or scoping studies may be undertaken prior to a fuller assessment. The following list sets out the kind of information that should be submitted as a FRA for development in Flood Zones 2 and 3:

Plans

- A location plan that includes geographical features, street names and identifies the catchment, watercourses or other bodies of water in the vicinity.
- A plan of the site showing
 - existing site;
 - development proposals;
 - identification of any structures, which may influence local hydraulics. This will include bridges, pipes/ducts crossing the watercourse, culverts, screens, embankments, walls, outfalls and condition of channel.

Surveys

- Site levels related to Ordnance Datum, both existing and proposed
- Appropriate cross-section(s) of the site showing finished floor levels or road levels, or other relevant levels relative to the source of flooding, and anticipated water levels and associated probabilities.

Assessments

- Consideration of whether the site falls within the functional flood plain as defined by the draft Practice Guide to Planning Policy Statement 25 (PPS25), and if so, demonstration that development meets the vulnerability criteria set out in table D1 PPS25.
- Flood alleviation measures already in place, their state of maintenance and their performance.
- Information about all potential sources of flooding that may affect the site – from rivers and the sea, streams, surface water run-off, sewers, groundwater, reservoirs, canals and other artificial sources or any combination of these.
- The impact of flooding on a site including:
 - i. the likely rate or speed of surface water run-off with which flooding might occur;
 - ii. the order in which various parts of the location or site might flood;
 - iii. the likely duration of flood events
 - iv. the economic, social and environmental consequences of flooding on occupancy of the site
 - v. information on extent and depth of previous flood events or on flood predictions.
- An assessment of how safe access and exit can be provided for routine and emergency access under both frequent and extreme flood conditions.
- An assessment of how the layout and form of development can be used to reduce or minimise flood risk.
- An assessment of the capacity of any drains or sewers, existing or proposed, on the site during various flood events.
- An assessment of the volume of surface water run-off likely to be generated from the proposed development.
- Proposals for surface water management according to sustainable drainage principles, with the aim of not increasing, and where practicable, reducing the rate of runoff from the site as a result of the development
- The likely impact of any displaced water on third parties caused by alterations to ground levels or raising flood embankments.
- The potential impact on fluvial or coastal morphology and the likely longer-term stability and sustainability of existing defences.
- Estimates should be made of how climate change could affect the probability and intensity of flood events. The assessment should ensure that the development meets an acceptable standard of flood protection for the design life of the development. The hydrological analysis of flood flows and definition of defence standards needs to include the allowances for increased flows and sea level rise contained in DEFRA's project appraisal guidance for flood defence and in accordance with Appendix B of PPS 25 or the latest information from UKCIP.
- The residual risks to the site after the construction of any necessary defences and the means of managing those.
- Consideration of the proposal relative to any existing Strategic Flood Risk Assessment carried out by the local authority.

Exception Test requirements

In addition to the requirements listed above, when completing a FRA as part of meeting the requirements of the Exception Test, an assessment will be required of on and off site opportunities for reducing flood risk overall. This will include an appraisal of the strategic flood risk management measures to which the development can contribute.

For further information on the Exception Test contact the Local Planning Authority.

What is the Environment Agency's Role?

We will usually provide comments at the planning application stage on Flood Risk Assessments covered by this guidance note. (unless indicated otherwise by Environment Agency Planning Liaison team in the area where the development is proposed). We have three main interests:

- Ensuring that the calculation and design of the site drainage and flood risk management measures meet Environment Agency policies and plans where present, resulting in a contribution to sustainable development.
- If the proposal is within the Byelaw Distance ² of a Main River ³ or flood defence structure, or includes the diversion or culverting of an Ordinary Watercourse ⁴ then formal consent for the proposal may also be required from us.
- Prior to carrying out a FRA, developers should contact the Environment Agency and other operating authorities (including the engineering department of the local authority or Internal Drainage Board as appropriate) to establish whether any information is available relating to flood risk at the site they propose to develop. It should be noted that, whilst we can provide information on flooding from rivers and the sea, we only record known problems relating to other sources. The absence of information in this respect does not mean that a site will not flood. Developers should also take full account of the local knowledge of flooding in the community and account for this within the FRA.

Figure 2 : River Ouse and Foss Catchment Boundaries (alternative plan)

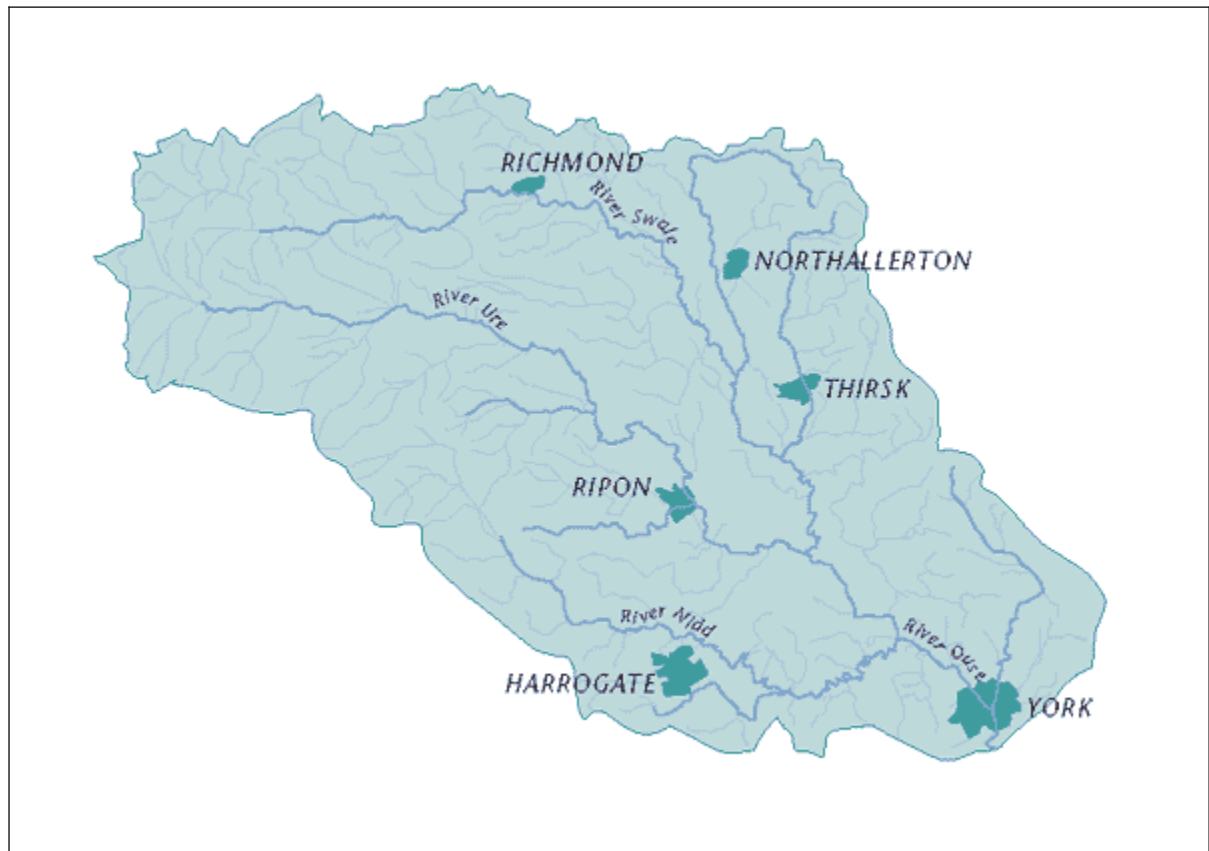


Figure 2 : River Ouse and Foss Catchment Boundaries

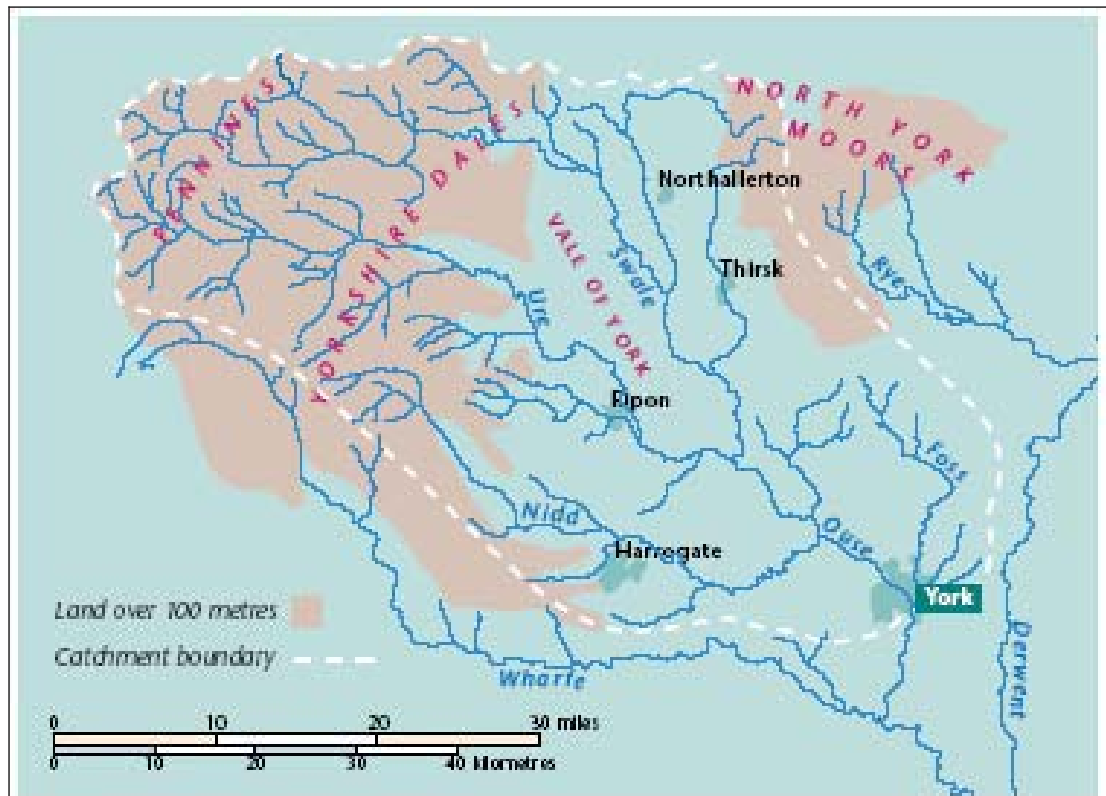
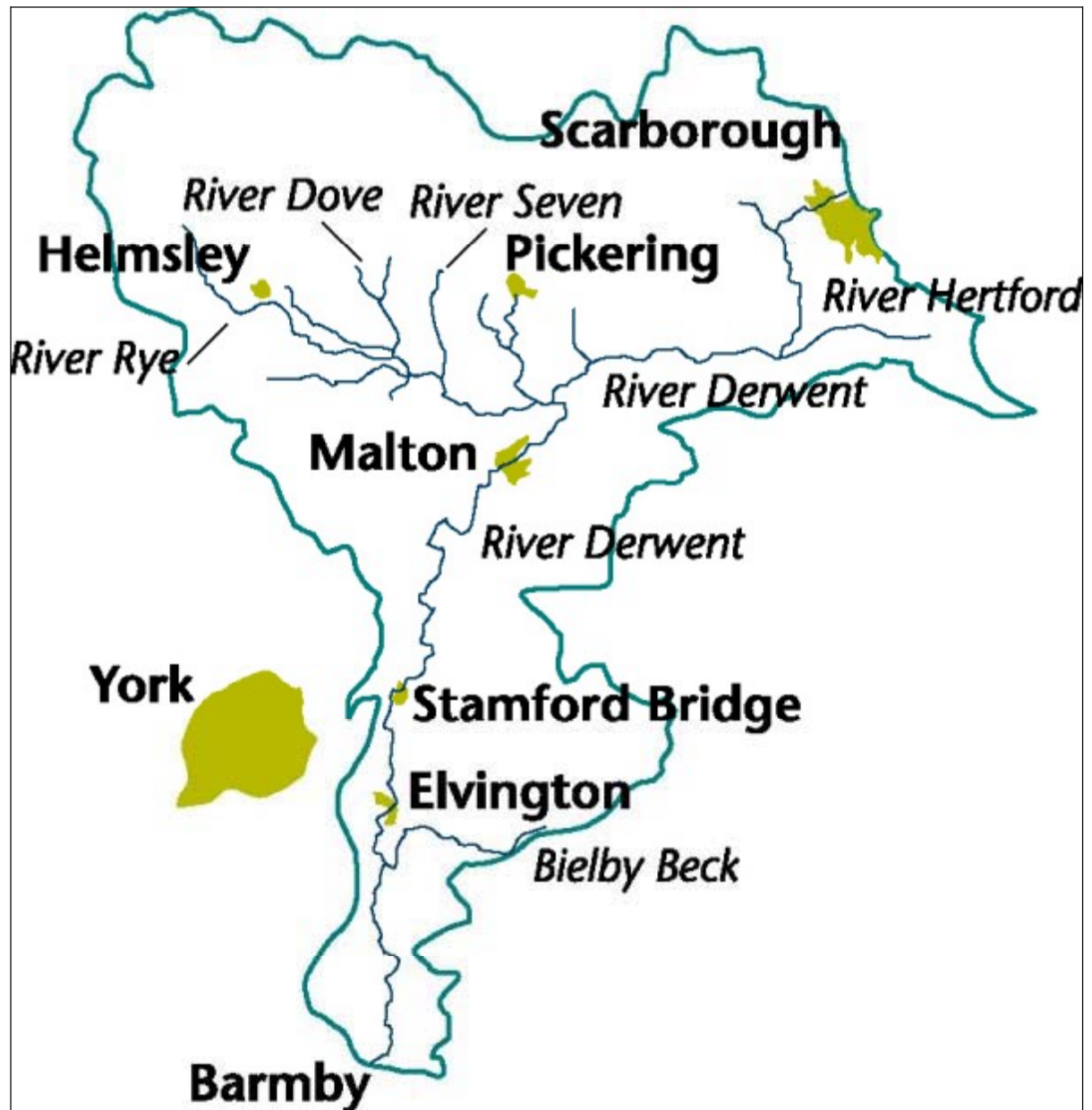
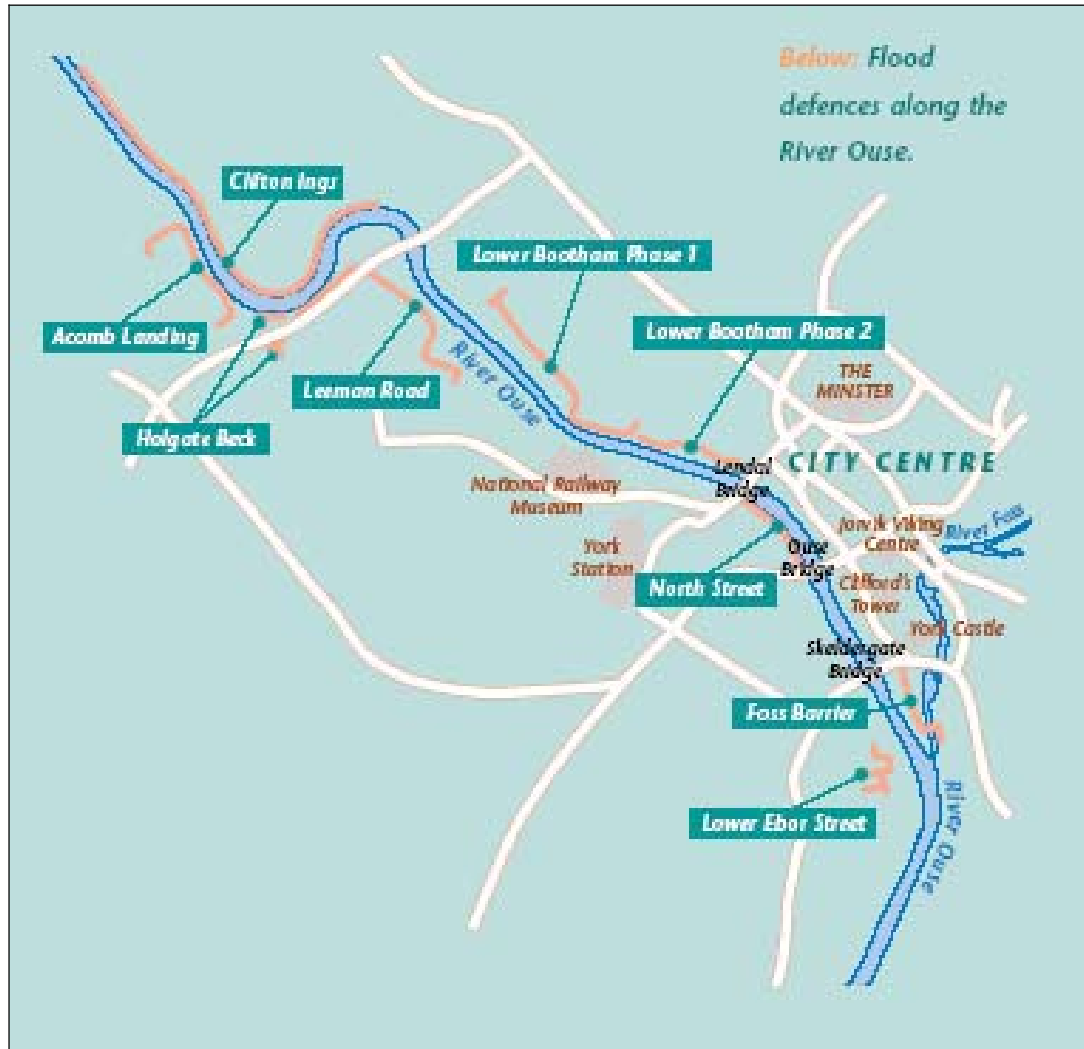


Figure 3 : River Derwent Catchment Boundary



5.2.2 **Figure 7** : Existing York Flood Defences





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