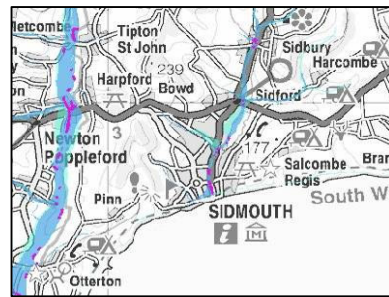
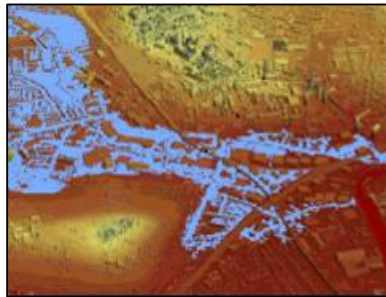


East Devon District Council
Strategic Flood Risk Assessment
Level 1 SFRA - Executive Summary

September 2008

Halcrow Group Limited



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East Devon District Council

Strategic Flood Risk Assessment

Level 1 SFRA - Executive Summary

Contents Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description	Date	Signed
1	Draft	Executive Summary	23 September 2008	R Brooks
2	Final		26 September 2008	D Kensett D Wilson T Styles A Barnes PS Rayner

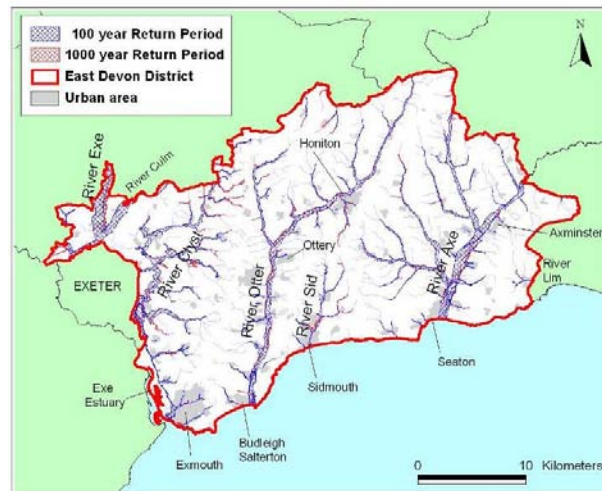
Executive Summary

1 Introduction

1.1 Background

In February 2008, East Devon District Council commissioned Halcrow to produce a Level 1 Strategic Flood Risk Assessment (SFRA).

The SFRA has been prepared to support the application of the Sequential Test outlined in Planning Policy Statement 25: Development and Flood Risk (PPS25), and to provide information and advice in relation to land allocations and development control.



East Devon SFRA area

The SFRA has assessed all forms of flood risk: fluvial (rivers), coastal, surface water, groundwater, sewer and flooding from artificial sources (reservoirs and canals), both now and in the future given the likely impacts of climate change.

The SFRA includes maps of the flood risks.

1.2 Purpose of the SFRA

- ◀ Inform the Sustainability Appraisal so that flood risk is taken into account when considering options in the preparation of strategic land use policies;
- ◀ Propose appropriate policy recommendations for the management of flood risk within the Local Development Documents;
- ◀ Determine the flood risk in relation to emergency planning capability;
- ◀ Identify the level of detail required for future site-specific Flood Risk Assessments (FRAs) that support planning applications.

The SFRA output is relevant not only to planning and development control, but also FRAs and mapping for emergency planning, alleviation of flood risk within existing urban development and surface water management plans.

1.3 Structure of the SFRA document

This document comprises two separate volumes:

- ◀ **Volume I** is the main report which provides a summary of the catchments, relevant policies, current flood risks, the potential impacts of climate change, flood risk management practices and policy recommendations.
- ◀ **Volume II** contains the SFRA maps illustrating all flood risks in East Devon.

The SFRA is a "living" document to be updated as new data becomes available.

1.4 Key sources of flood risk data

East Devon District Council and the Environment Agency have provided data and have been closely involved with this SFRA. In addition, other key stakeholders have been consulted (Devon County Council, South West Water, Devon and Somerset Fire and Rescue Service, Highways Agency) and they have provided data on known flood incidents.

2 Planning Policy Statement 25: Development & Flood Risk (PPS25)

PPS25 on development and flood risk, published as part of the Government's 'Making Space for Water' strategy, seeks to provide clearer and more robust guidance to ensure that current and future flood risk is taken into account at all levels of the planning system.

PPS25 recognises that, although flooding cannot be wholly prevented, its impacts can be avoided and reduced through good planning and management. Flood risk is required to be taken into account at all stages in the planning process to avoid inappropriate development in areas of flood risk and to direct development away from areas of highest risk. This is referred to by PPS25 as the sequential approach.

2.1 The Sequential Test

A key aim of a Level 1 SFRA is to guide development to the appropriate Flood Zone using the Sequential Test. This is a process whereby preference is given to locating a new development in Flood Zone 1 (Low Probability).

If there is no reasonably available site in Flood Zone 1, the flood vulnerability of the proposed development can be taken into account in locating development in Flood Zone 2 (Medium Probability) and then Flood Zone 3 (High Probability).

Within each Flood Zone:

- ◀ New development should be directed to sites with lower flood risk (towards the adjacent zone of lower probability of flooding) from all sources as indicated by the SFRA maps.
- ◀ Flood vulnerability of the development should be matched to the flood risk of the site, e.g. higher vulnerability uses should be located on parts of the site at lowest probability of flooding.

The Sequential Test demonstrates whether there are any reasonably available sites, in areas with a lower probability of flooding that would be appropriate to the type of development or land use proposed. PPS25 summarises the appropriate uses of each zone, as well as Flood Risk Assessment (FRA) requirements and policy aims for each.

2.2 The Exception Test

Where it is not possible, or consistent, with wider sustainability objectives, for development to be located in Flood Zones of lower probability of flooding, the Exception Test can be applied (in appropriate circumstances – see main report) for wider sustainability reasons to avoid social or economic blight.

The Exception Test therefore provides a method of managing flood risk while allowing necessary development to occur. The Exception Test cannot be applied if a site has already failed the Sequential Test.

2.3 Level 2 SFRAs

The Level 2 SFRA involves a more detailed review of flood hazard (flood probability, flood depth, flood velocity, rate of onset of flooding) taking into account the presence of flood risk management measures such as flood defences. These are used in exceptional circumstances where lower flood risk sites are not available and the variation in flood risk across a site requires further analysis.

3 Planning Policy

Flood related planning policy at national, regional and local levels is detailed in the main report (Volume I). This highlights that flood risk is taken into account at every hierarchical level within the planning process. A series of policy recommendations are made, and information contained in the SFRA provides evidence to facilitate the preparation of robust policies for flood risk management.

4 Key findings of the SFRA

The SFRA has assessed all sources of flooding using the information supplied by East Devon District Council, the Environment Agency and other key stakeholders.

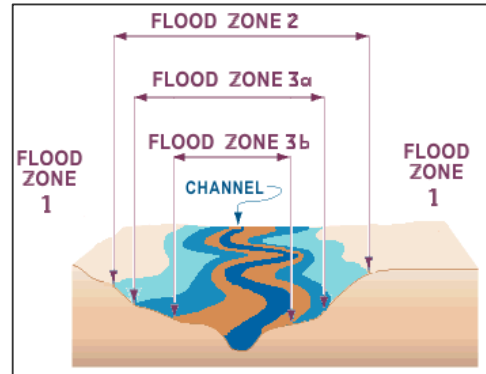
4.1 Flood Zones

The SFRA Flood Zones are equivalent to the current Environment Agency flood map, and present the best available flood information. The current published Environment Agency Flood Map is a mixture of modelled flood outlines and JFLOW extents produced by running their national generalised computer model onto ground survey data (LiDAR).

The various data sources and the relative confidence in these datasets are detailed in the main report (Volume I). SFRA flood maps are presented (Volume II) to provide a detailed picture of the extent of all sources of flooding.

The SFRA Flood Zone maps are defined based on the best available information and show:

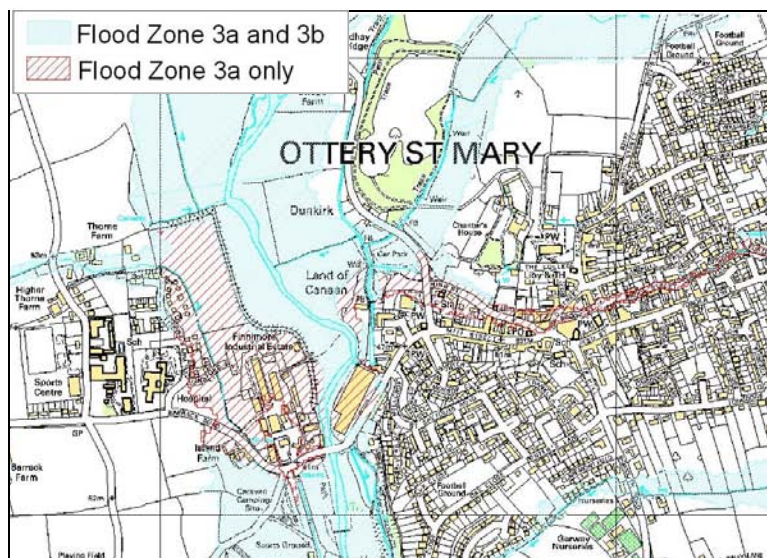
- Flood Zone 1** – All areas that are considered to be at little risk of fluvial or coastal flooding, which is land assessed as having a less than 0.1% Annual Exceedence Probability or AEP (an explanation of AEP is given in the glossary of the main report).



Whilst fluvial or coastal flooding is not a concern in these areas, the risk of flooding from other sources, such as surface water, groundwater, sewers and artificial sources may still be an issue.

- Flood Zone 2** – Shows areas at risk of flooding in an extreme fluvial or coastal flood event. This zone shows those areas with a risk of flooding between a 0.1% and either 0.5% AEP for coastal flooding or 1% AEP for fluvial flooding.
- Flood Zone 3a** – This represents the area that is part of Flood Zone 3, but outside Flood Zone 3b (Functional Floodplain). This zone identifies the areas at risk from a 1% AEP flood event.
- Flood Zone 3b (Functional Floodplain)** – The Functional Floodplain shows areas of land which are frequently flooded. For many areas it has been necessary to make conservative assumptions about the extent of the functional floodplain in the absence of historical flood outlines and detailed models.

The Functional Floodplain has been assumed to be equivalent to Flood Zone 3a across much of the study area (shaded light blue in the example figure below), except behind defences and where allocation-specific flood risk assessments have identified otherwise (shaded with the red diagonal hatching).



4.2 Flood risks - artificial sources

There are four reservoirs/lakes situated within East Devon

- ◀ Otterton Reservoir (storage volume: 106,285 m³)
- ◀ Bicton College Lake (105,000 m³)
- ◀ Squabmoor (63,600 m³)
- ◀ Hogsbrook (50,800 m³)

Three of the reservoirs are located immediately upstream of settlement areas, where the impact of a major (and extremely rare) overtopping or breach event could result in loss of life and other catastrophic consequences. The affected settlements are Woodbury, Budleigh Salterton, and Otterton.

From Spring 2009 reservoir undertakers for high consequence reservoirs will be required to produce reservoir flood plans, which will include inundation maps and therefore inform the flood risk. However, ahead of this legal requirement, such information is generally unavailable.

4.3 Flood risks - key infrastructure and services

The flood risk in relation to particular locations within East Devon, including hospitals, schools and important infrastructure such as major roads, rail, water treatment works, electricity stations, etc has been considered. Key infrastructure and services intersected by the Flood Zone 3, are listed in the main report (Table 6.4).

4.4 Development Potential

In allocating sites for development, East Devon District Council will be required to undertake the Sequential Test if promoting any areas that lie within Flood Zones 2, 3a or 3b at any point throughout the developments life. By applying the Sequential Test the more vulnerable uses of land can be allocated to the lowest risk sites.

Only where there are no reasonably available sites in Flood Zones 1 or 2 should the suitability of sites in Flood Zone 3 be considered, taking into account the flood risk vulnerability of land uses and applying the Exception Test if required.

4.5 Potential for Flood Defence Failure

There is a series of defences within the study area, together with four reservoirs and a number of flood warning procedures. As with any flood defence there is a residual risk that a defence may fail, as a result of either overtopping and/or a breach.

Should such an event occur it may result in rapid inundation of the local community behind the flood defence, and may pose a risk to life. In the event that the Sequential Test needs to be applied to specific site allocations behind a flood defence, the scope of the SFRA should be extended (Level 2 assessment) to refine information on the flood hazard in the location.

4.6 Development Implications

The SFRA has identified the areas within East Devon at risk of flooding based on the best available information. In order to minimise the flood risks posed to all potential development the Sequential Test will need to be applied for all land use allocations.

It is recommended that areas affected by surface water and sewer flooding should not necessarily be a limit to future development, but that all potential development locations are checked to ensure that capacity exists within the drainage networks to reduce the risk of flooding. The SFRA does however underline the importance of Sustainable Drainage Systems (SuDS) in new development.

Across the whole of the study area, developers should seek to maximise the reduction of runoff from a site. This is because large increases in impermeable areas contribute to significant increases in surface runoff volumes and peak flows.

There are numerous different ways that SuDS can be incorporated into a development to manage surface water drainage to avoid increases in peak flows and volumes. The appropriate application of a SuDS scheme to a specific development is heavily dependent upon the topography and geology of a site and the surrounding areas.

5 SFRA User guide

The SFRA user guide (next page) illustrates how the SFRA should be used by forward planners, drainage engineers, development control, emergency planners and developers to minimise the risks posed by flooding.

6 Concluding Remarks

The risk of flooding within the study area arises from river, coastal, surface water, groundwater and sewer flooding. The SFRA flood maps with an allowance for climate change show that many urban areas within the study area are at risk of flooding from a 1% fluvial or 0.5% coastal annual probability flood extent (Flood Zone 3).

Eight of the potential growth areas in East Devon contain elements that fall within Climate Change Flood Zone 3, although in many cases the area affected is small. The Sequential Test should be applied to direct any development away from these higher flood risk areas, but where this is not possible a Level 2 SFRA will be required to inform flood risk and the Exception Test must be passed.

