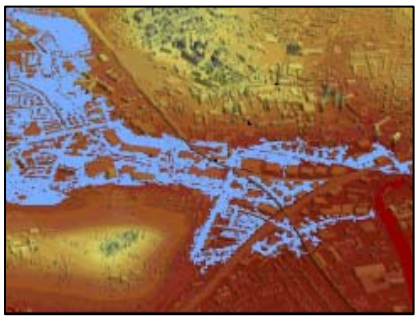
South Somerset District Council

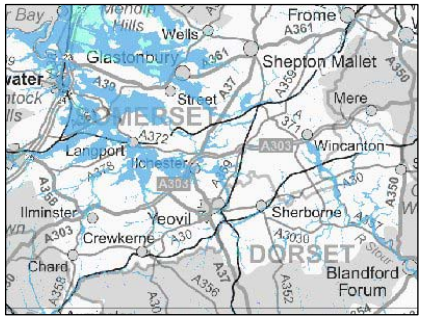
Strategic Flood Risk Assessment

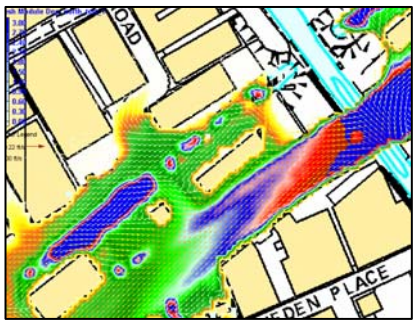
Level 1 SFRA - Executive Summary

August 2008

Halcrow Group Limited







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South Somerset District Council

Strategic Flood Risk Assessment

Level 1 SFRA - Final Report

Contents Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description	Date	Signed
1	0	Executive Summary	22 May 2008	D Kensett
2	1		11 July 2008	A Corner
2	1		27 August 2008	A McConkey M Barker P Crozier D Wilson PS Rayner

Executive Summary

1 *Introduction*

1.1 *Background*

In November 2007, South Somerset 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.

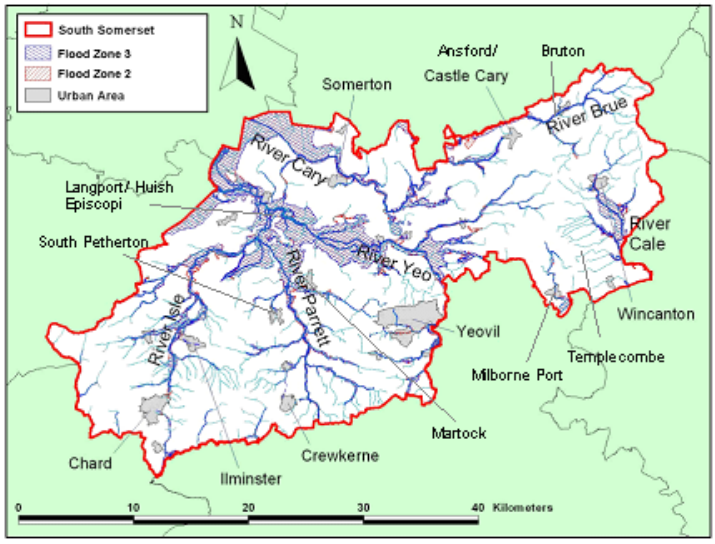


Figure 1 South Somerset SFRA area

The SFRA has assessed all forms of flood risk: tidal, fluvial (rivers), 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 acceptability of 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 policy and development control, but also site specific flood risk assessments 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 the study area

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

1.4 Key sources of flood risk data

In order to assess flood risks, South Somerset 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 (Wessex Water, South West Water, Somerset County Council, Somerset Drainage Boards Consortium) and they have provided data on known flood incidents.

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

PPS25 on development and flood risk, published as part of the Governments' 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.

If there is no reasonably available site in Flood Zone 1 (Low Probability), 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.

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 section 3.5 of the 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 should only be applied following application of the Exception Test.

2.2 *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 SFRA User guide

The SFRA user guide (appended to this Executive Summary) 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.

4 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.

5 Key findings of the SFRA

5.1 Flood risks - all types

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

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 these modelled flood outlines and JFLOW extents produced by running their national generalised computer model onto Lidar.

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

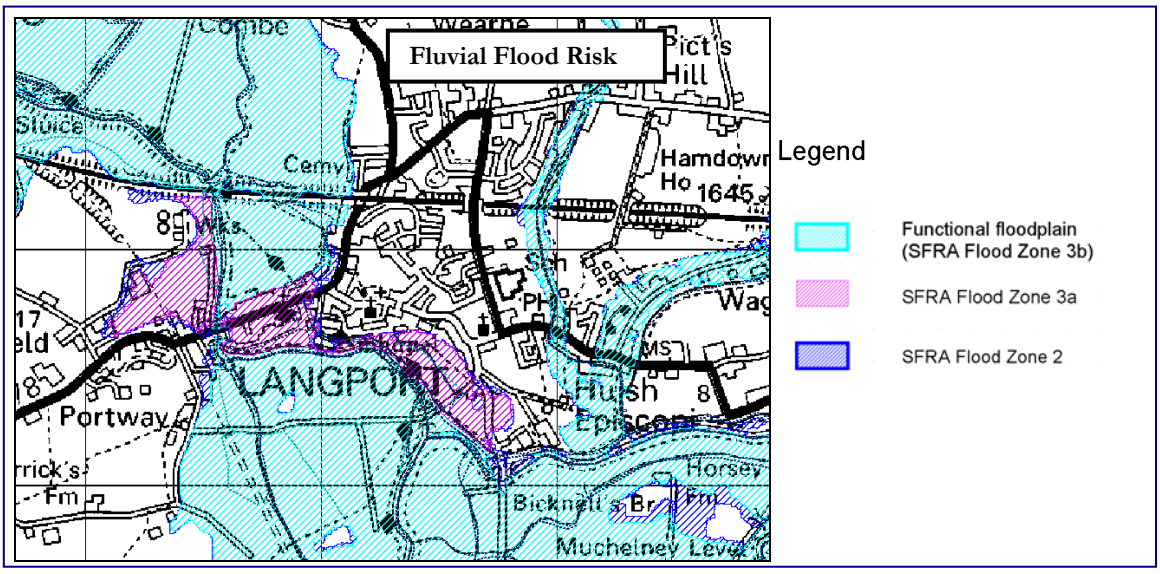


Figure 2 An example of the fluvial flood risk within South Somerset

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

- **Flood Zone 1** – All areas that are not considered to be at risk of fluvial flooding. Whilst fluvial flooding flooding is not a concern in these areas, the risk of flooding from other sources, such as surface water, groundwater, sewers and artificial sources (reservoirs and canals) may still be an issue.
- **Flood Zone 2** – Shows areas at risk of flooding in an extreme fluvial flood event. This zone shows those areas with a risk of flooding between a 0.1% and 0.5% / 1% Annual Exceedence Probability (AEP).
- **Flood Zone 3a** – This represents the area that is part of Flood Zone 3, but outside Flood Zone 3a (Functional Floodplain). This zone identifies the areas at risk from a 1% AEP fluvial 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, except behind defences and where allocation specific flood risk assessments have identified otherwise.

The flood risk in relation to particular locations within South Somerset, 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 3a, are detailed below.

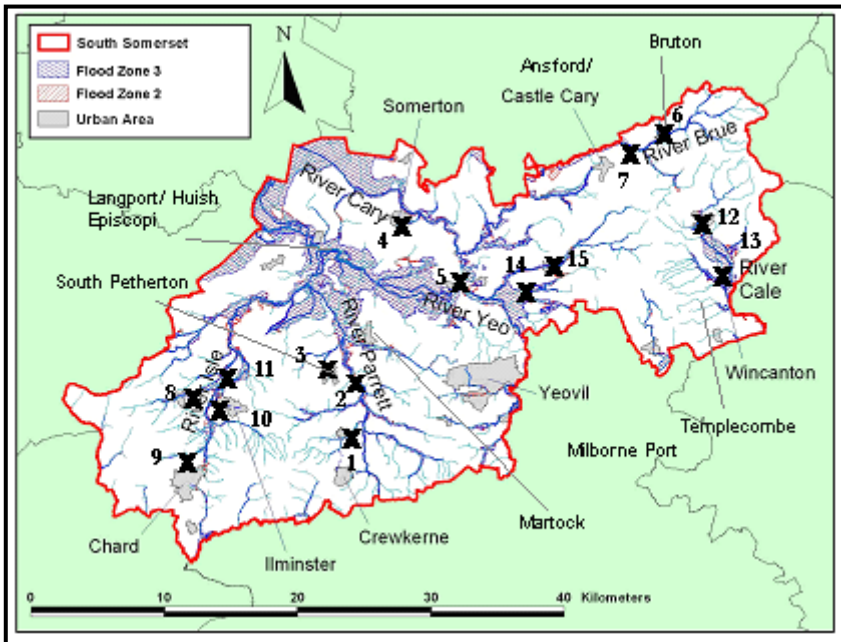


Figure 3
Key services & infrastructure at risk of fluvial flooding

Watercourse	Ref	Grid Reference	Type	Description
River Parrett	1	345161,112774	Works	Sewage Works
	2	345095,116723	Road	A303
North Mill Brook	3	343066,117501	Building	Sewage Works
Mill Stream	4	363760,133613	Rail	Station Path
River Yeo	5	353979,123322	Airfield	Royal Navy Air Station
River Brue	6	368405,134810	Road	A359
	7	367120,133921	Works	Sewage Works
River Ding	8	333219,115581	Works	Sewage Works
River Isle	9	332063,110944	Works	Sewage Works
	10	334731,114954	Building	Industrial Estate
	11	335581,116273	Works	Sewage Works
River Cale	12	371166,127396	Works	Sewage Works
Bow Brook	13	373395,123573	Rail	Railway Line
River Cam	14	359557,125013	Building	School
Hornsey Brook	15	356911,122181	Building	School

5.2 Flood risks - artificial sources

There are 13 reservoirs/lakes situated within South Somerset. The risk of failure of these reservoirs need not constrain the location of development, but it is likely that should any major development be proposed in the area downstream of these reservoirs then an extended scope SFRA (Level 2) will be required to determine the risk posed by overtopping or breach of the embankment and to inform appropriate mitigation measures.

5.3 *Growth areas for development*

A preliminary review of the 13 settlements identified as potential sites of for future development has been undertaken. **Table 2** provides a summary of these areas according to the PPS25 Flood Zones with and without climate change and other sources of flooding. It should be noted that the Sequential Test has not yet been undertaken and the growth areas are subject to review - for this reason the classifications detailed in **Table 2** are likely to change.

From Table 2 it is apparent that some of the growth areas intersect with Flood Zone 3b (Functional floodplain) and Flood Zone 3a when the potential effects of climate change are taken into account.

In allocating sites for development South Somerset 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.

Table 2 Flood Zone classification for existing urban areas

South Somerset Local Plan settlement category	Urban area	Does the urban area intersect with existing Flood Zone 3?	Does the urban area intersect with Climate Change Flood Zone 3?	Is the urban area affected by other sources of flooding+?
Towns	Yeovil	Yes	Yes	Yes
	Chard	No*	No*	Yes
	Crewkerne	No*	No*	Yes
	Ilminster	No*	No*	Yes
	Wincanton	Yes	Yes	Yes
Rural Centres	Bruton	Yes	Yes	No
	Castle Cary/Ansford	No*	No*	Yes
	Langport/Huish Episcopi	Yes	Yes	Yes
	Martock	Yes	Yes	Yes
	Milborne Port	Yes	Yes	Yes
	Somerton	Yes	Yes	Yes
	South Petherton	Yes	Yes	Yes
Village	Templecombe	No	No	No

* Flood Zone is in close proximity to the urban area and may impact proposed expansions to growth area

+ Other sources of flooding refers to surface water, groundwater and sewer flooding

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.

5.4 Potential for Flood Defence Failure

There are a series of defences within the study area, together with 14 flood storage areas 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 to a Level 2 assessment to refine information on the flood hazard in the location.

6 Development Implications

The SFRA has established that there are areas within South Somerset at risk of flooding. 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 in new development.

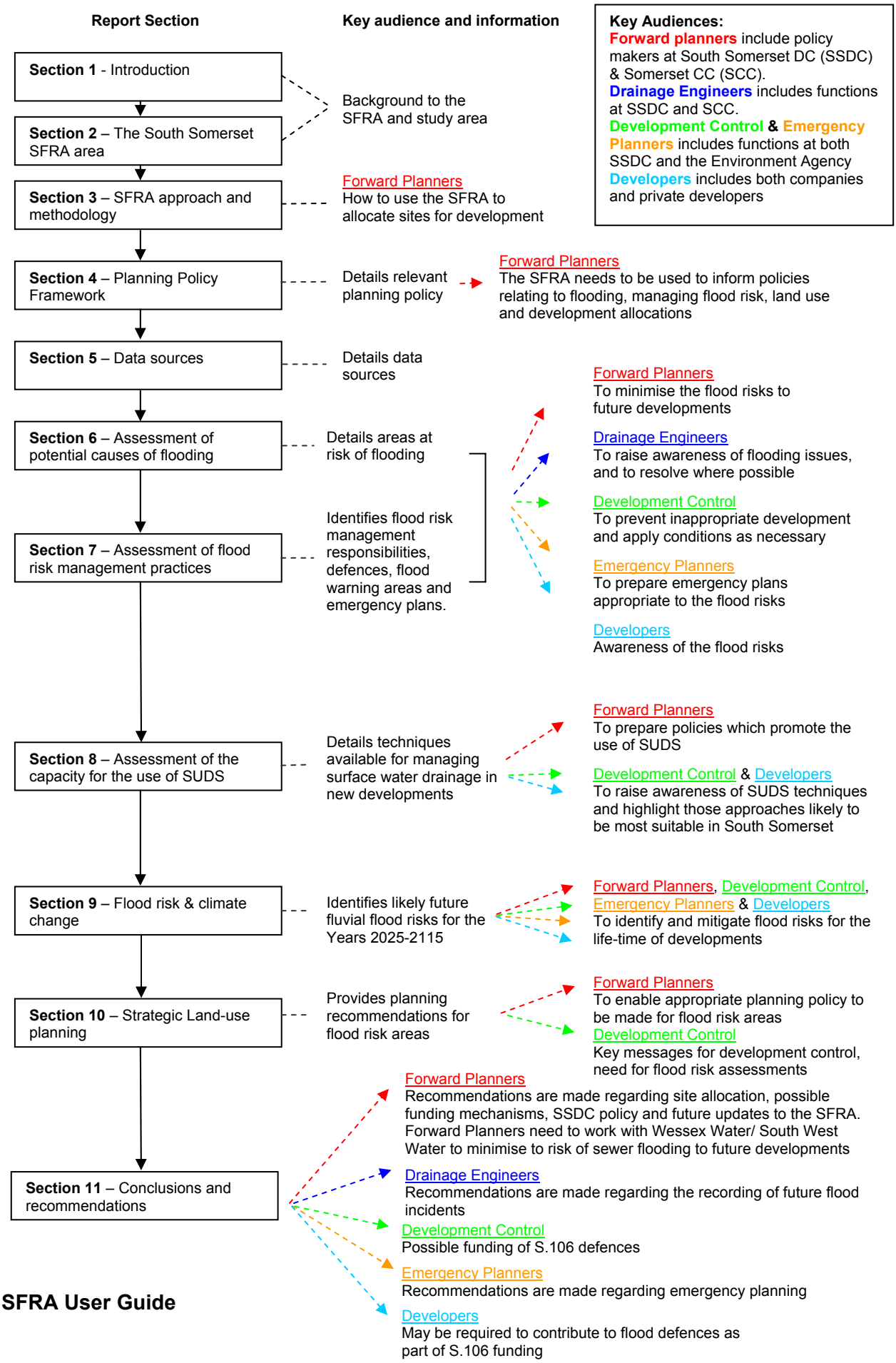
Across the whole of the study area, developers should seek to maximise the reduction of runoff from a site. This is because large increases in impermeable areas contribute to significant increases in surface runoff volumes and peak flows.

There are numerous different ways that Sustainable Drainage Systems (SUDS) can be incorporated into a development to manage surface water drainage to avoid increases in peak flows and volumes, but 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.

7 Concluding Remarks

The risk of flooding within the study area arises from river, 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 annual probability flood extent (Flood Zone 3a).

Eight of the growth areas contain elements that fall within 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.



SFRA User Guide