

1 Appendix C - Data sources used in the SFRA

1.1 Fluvial flooding

1.1.1 Flood Zones 2 and 3a

Flood Zone 2, as shown in Appendix A, was created based on the 0.1% AEP (undefended 1 in 1000-year chance of flooding in any given year) extents produced from the Environment Agency detailed hydraulic models where outputs were available and historic fluvial events recorded by the Environment Agency. Where detailed modelling was not available, the Environment Agency's Flood Map for Planning Flood Zone 2 was used.

Flood Zone 3a, as shown in Appendix A, was created based on the 1% AEP (undefended 1 in 100-year chance of flooding in any given year) extents produced from the Environment Agency detailed hydraulic models where outputs were available and historic fluvial events recorded by the Environment Agency. Where detailed modelling was not available, the Environment Agency's Flood Map for Planning Flood Zone 3 was used.

Detail on where hydraulic models were used to inform the Flood Zones is included in Appendix F.

Over time, the online mapping is likely to be updated more often than the SFRA, so SFRA users should check there are no major changes in their area.

1.1.2 Flood Zone 3b (the Functional Floodplain)

Flood Zone 3b, as shown in Appendix B, has been compiled for the study area as part of this SFRA and is based on the 5% AEP (1 in 20-year chance of flooding in any given year) or 4% AEP (1 in 25-year chance of flooding in any given year) extents produced from Environment Agency detailed hydraulic models, where outputs were available. This information is only available in the SFRA and not shown on the online map.

For areas not covered by detailed models, a precautionary approach should be adopted for Flood Zone 3b with the assumption that the extent of Flood Zone 3b would be equal to Flood Zone 3a. If development is shown to be in Flood Zone 3a, further work should be undertaken as part of a detailed site-specific Flood Risk Assessment to define the extent of Flood Zone 3b.

If the area of interest is in an area that has seen some major changes to the extent of the Flood Zones, having checked the online mapping, Developers will also need to remap Flood Zone 3b as part of a detailed site-specific Flood Risk Assessment.

1.1.3 Climate change

Please refer to Chapter 4 of the main SFRA report for information on the approach to climate change in this SFRA.

1.1.4 Surface water

Mapping of surface water flood risk in study area has been taken from the Risk of Flooding from Surface Water (RoFfSW) maps published online by the Environment Agency. These maps are intended to provide a consistent standard of assessment for surface water flood risk across England and Wales in order to help LLFAs, the Environment Agency and any potential developers to focus their management of surface water flood risk.

The RoFfSW is derived primarily from identifying topographical flow paths of existing watercourses or dry valleys that contain some isolated ponding locations in low lying areas. They provide a map which displays different levels of surface water flood risk depending on the annual probability of the land in question being inundated by surface water (Table C-1).

Table C-1: RoFfSW risk categories

Category	Definition
High	Flooding occurring as a result of rainfall with a greater than 1 in 30 chance in any given year (annual probability of flooding 3.3%)
Medium	Flooding occurring as a result of rainfall of between 1 in 100 (1%) and 1 in 30 (3.3%) chance in any given year.
Low	Flooding occurring as a result of rainfall of between 1 in 1,000 (0.1%) and 1 in 100 (1%) chance in any given year.

Although the RoFfSW offers improvement on previously available datasets, the results should not be used to understand flood risk for individual properties. The results should be used for high level assessments such as SFRA for local authorities. If a site is indicated in the Environment Agency mapping to be at risk from surface water flooding, a more detailed assessment should be considered to more accurately illustrate the flood risk at a site-specific scale.

1.1.5 Groundwater

Mapping of groundwater flood risk has been based on the Areas Susceptible to Groundwater Flooding (AStGWF) dataset.

The AStGWF dataset is a strategic-scale map showing groundwater flood areas on a 1km square grid. It shows the proportion of each 1km grid square, where geological and hydrogeological conditions indicate that groundwater might emerge. It does not show the likelihood of groundwater flooding occurring and does not take account of the chance of flooding from groundwater rebound (e.g. following cessation of mining or industrial activity). This dataset covers a large area of land, and only isolated locations within the overall susceptible area are actually likely to suffer the consequences of groundwater flooding.

The AStGWF data should be used only in combination with other information, for example local data or historical data. It should not be used as sole evidence for any specific flood risk management, land use planning or other decisions at any scale. However, the data can help to identify areas for assessment at a local scale.

1.1.6 Sewers

Historical incidents of flooding are detailed by Severn Trent Water through their 'At Risk Register'. The database records incidents of flooding relating to public foul, combined or surface water sewers and displays which properties suffered flooding. The risk register has been considered in the assessment of flood risk from sewers (see Chapter 5.8).

1.1.7 Reservoirs

The risk of inundation because of reservoir breach or failure of reservoirs within the area has been mapped using the outlines produced as part of the National Inundation Reservoir Mapping (NIRIM) study. These outlines were the same as those on the Long-Term Risk of Flooding website at the time of publication. The Environment Agency are currently updating their national reservoir flood maps and SFRA users should check there are no major changes to the reservoir maps before relying on the mapping in the SFRA.

1.1.8 Overview of supplied data for the South Worcestershire SFRA

Source of flood risk	Data used to inform the assessment	Data supplied by
Historic (all sources)	Historic Flood Map Recorded Flood Outlines Hydraulic Modelling Reports	Environment Agency
	2012 SFRA	South Worcestershire Councils
	SWMP floodspots	Worcestershire County Council
	Historic flood incidents/records	Canal and River Trust
	Sewer Flooding	Severn Trent Water Welsh Water
Fluvial (including climate change)	Kyre Brook (2010, JBA) Bow Brook (2002, JBA, <i>model not used</i>) River Salwarpe (2007, Halcrow) Barbourne Brook (2009, JBA) River Avon (2010, Halcrow Group Ltd, JBA) Noleham Brook (2015, Capita, AECOM) River Teme (2008, Capita Symonds) River Severn (2012, JBA) Carrant Brook (2013 Tewkesbury Tributaries SFRM, JBA, and 2017 Tewkesbury L2 SFRA, JBA) River Salwarpe (2007, Halcrow) River Salwarpe and tributaries (2016, JBA generalised 2d modelling) *Worcester New Road (2015 JBA) *Upton upon Severn (2016-18 JBA) *Persore (2016-17 JBA) *Eckington (2017 JBA)	Environment Agency/*Worcestershire County Council (highway adaptation modelling studies)
	Flood Map for Planning Flood Zones	Environment Agency
	Surface Water	Risk of Flooding from Surface Water dataset Environment Agency
	Groundwater	Areas Susceptible to Groundwater Flooding dataset Bedrock geology/superficial deposits datasets (online dataset) Environment Agency
	Sewer	Hydraulic Flood Risk Register Severn Trent Water
	Reservoir	National Inundation Reservoir Mapping Environment Agency
	Canal	Description of flood incidences Canal and River Trust