

# Local Flood Risk Management Strategy

# LOCAL FLOOD RISK

This document has been prepared so that West Sussex County Council meets its duties to manage local flood risk and deliver the requirements of the Flood and Water Management Act 2010

## PARTNERS OF THE WEST SUSSEX LOCAL FLOOD RISK MANAGEMENT STRATEGY



Horsham  
District  
Council



*Worthing*  
BOROUGH COUNCIL



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## Approvals

Name	Title	Signature	Date
<b>Stuart Smith</b>	<b>Highways Commissioning Manager</b>		<b>10/06/2013</b>
<b>Kevin Macknay</b>	<b>Drainage Strategy Team Leader</b>		<b>10/06/2013</b>

## Foreword

I am pleased to introduce the West Sussex Local Flood Risk Management Strategy. The flooding experienced in West Sussex in June 2012 highlighted many of the planning and emergency response challenges we face. The unprecedented rainfall, over 10cm in 24 hours, further underlined the need for responsibilities to be identified and tightened up, and that we the authorities should be investing in flood risk projects. Perhaps the greatest floods in history have been caused by rivers bursting their banks or by coastal sea flooding, but currently it is surface water flooding that is causing most impact to communities.

This is the first Local Flood Risk Management Strategy for the County since we have received new flood management duties and powers under the Flood and Water Management Act 2010. I see the document enabling West Sussex County Council engineers to prioritise and invest money in flood risk for local benefit. The local strategy will set out how we as a Lead Local Flood Authority will work alongside other risk management authorities to unify our collective delivery.

Some of the immediate questions that this local strategy will answer are, who has the responsibility and authority? What do you invest in? Where do you invest? How do you prioritise one area over another? What do you do first? Who maintains what you build and how much does that cost? There are tough challenges ahead because we cannot do everything. We cannot undertake every flood reduction project in this strategy, but it is important to have to risk and projects highlighted so when we can progress it is in a prioritised and sensible way. By answering these questions the local strategy will begin to enable West Sussex County Council as Lead Local Flood Authority to deliver the new responsibility of local flood risk management with our partners.

This strategy will identify the action that we need to take over the coming years to bring about a better, more sustainable approach that works with nature. It will help us to plan for the likely impacts of climate change and further urban development in the river catchment area. We look forward to using the strategy to help us target our efforts, use our precious resources in a better way, and reduce flood risk to the residents of West Sussex.

**Stuart Smith**

**Highways Commissioning Manager**

# Contents

<b>Executive Summary</b>	<b>7</b>
<b>Glossary and Acronyms</b>	<b>11</b>
<b>Chapter 1</b>	<b>14</b>
What is flood risk?	14
What is the likelihood of this happening and what does this mean?	14
What is the flood risk in the County?	15
Historic flood events	15
Surface water flooding	20
Groundwater flooding	20
Ordinary watercourse flooding	20
Coastal and tidal flooding	21
Main river flooding	21
Reservoir flooding	22
Sewer flooding	22
Areas susceptible to flood risk – the wet spots in the County	23
Horsham	31
Arun	31
Adur	32
Worthing	32
Chichester	32
Mid Sussex	33
Crawley	33
<b>Chapter 2</b>	
<b>Background</b>	<b>35</b>
<b>National Context</b>	<b>36</b>
<b>Local Context</b>	<b>38</b>
<b>Responsibilities for flood risk management</b>	<b>40</b>
West Sussex County Council	40
Environment Agency	41
Internal Drainage Boards	41
Southern Water	42
Second tier authorities	42

Highway Authority	43
Utility and infrastructure providers	43
Riparian owners	43
Parish and Town Councils	44
Property owners and residents	44
<b>Objectives</b>	<b>44</b>
<b>West Sussex County Council : Responsibilities under the Flood and Water Management Act 2010</b>	<b>45</b>
Strategic Leadership	45
Power to reduce flooding from surface water and groundwater	45
Power to request information	46
Duty to investigate flooding	46
Flood asset register	46
Power to designate features	46
Sustainable drainage systems approving body	47
Ordinary watercourse consenting	47
Enforcement	48
Sustainable development	48
<b>West Sussex County Council : Responsibilities outside of the Flood and Water Management Act 2010</b>	<b>48</b>
Actions as a result of the June 2012 flooding in West Sussex	48
Requirements under the EU Flood Directive : Flood Risk	48
Planning control	49
Response, rescue and recovery	49
The Water Framework Directive	50
Partnership working and South East Seven	51
<b>Chapter 3</b>	<b>53</b>
Funding and the local programme	53
Funding for key flood risk management activities	50
The action plan	55
What is being done in my area?	55
How do projects make in onto the work programme?	56
Next Steps	57
<b>Chapter 4</b>	<b>58</b>
Strategic Environment Assessment (SEA)	58

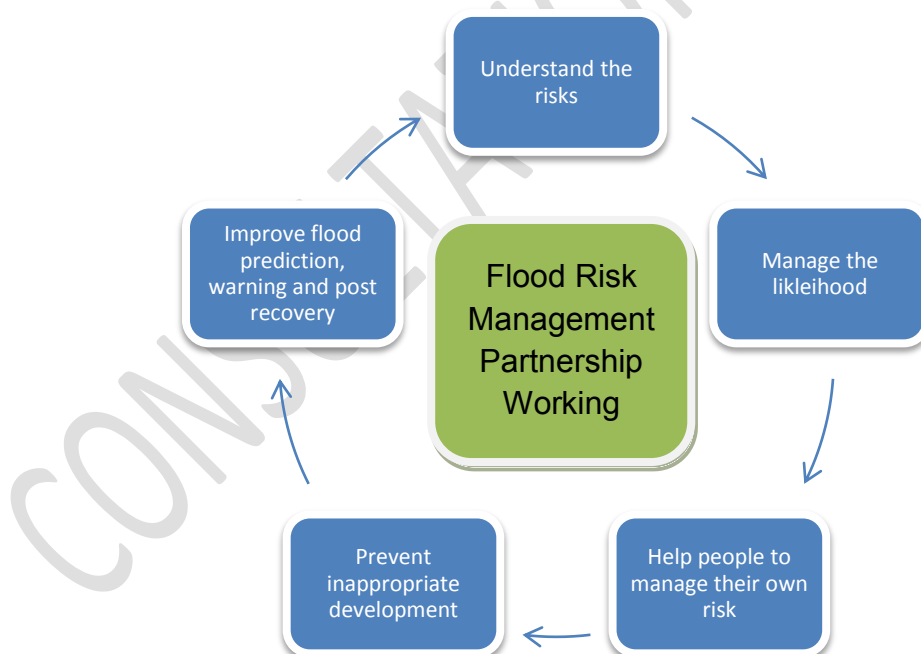
	<b>Appendix A</b>	<b>59</b>
The Project Team		
	<b>Appendix B</b>	<b>60</b>
The Wet Spot Maps		
	<b>Appendix C</b>	<b>62</b>
Legislation relevant to the Local Flood Risk Management Strategy		
	<b>Appendix D</b>	<b>63</b>
The West Sussex Work Programme		
	<b>Appendix E</b>	<b>64</b>
Funding		
	<b>Figures</b>	
Figure 1 : Properties at risk in the county by flooding source		16
Figure 2 : The West Sussex County Council Surface Water Flood Map		18
Figure 3 : The West Sussex County Council River and Sea Flood Map		19
Figure 4 : The West Sussex County Council Wet Spot Map		24
Figure 5 : The West Sussex County Council Wet Spot areas and numbers of properties at risk by source		25
Figure 6 : The Appendix B Wet Spot flood map information		30
Figure 7 : Properties at risk in England and Wales by flood source		35
Figure 8 : Who manages what?		38
Figure 9 : Who manages what within West Sussex?		39
Figure 10 : The funding avenues available to West Sussex County Council		54
Figure 11 : Contributions and full funding		57

## Executive Summary

This local flood risk strategy sets out how West Sussex County Council will operate its flood risk responsibilities that are a statutory requirement of the Flood and Water Management Act 2010. Following the 2007 floods and independent Pitt Report, the Act transposed local flood risk leadership into UK Law. As part of this fundamental change in flood risk management responsibility, West Sussex County Council have become a Lead Local Flood Authority and are required to plan in a local strategy how to carry out this new role. This local strategy will be completed and published in 2013.

Working in partnership is integral to the local flood risk strategy. To enforce this partnership approach we consider all types of flooding within this strategy so that the complete flood story can be told. The structure and contents of this strategy are directly informed by the Environment Agency's National Strategy and the guiding principles of the Local Government Association Framework 'Living Document' (2<sup>nd</sup> Edition November 2011). The work of neighbouring Lead Local Flood Authorities and other risk management authority partners has been taken into account so that our management can be joined up, and not be restricted by our administrative borders.

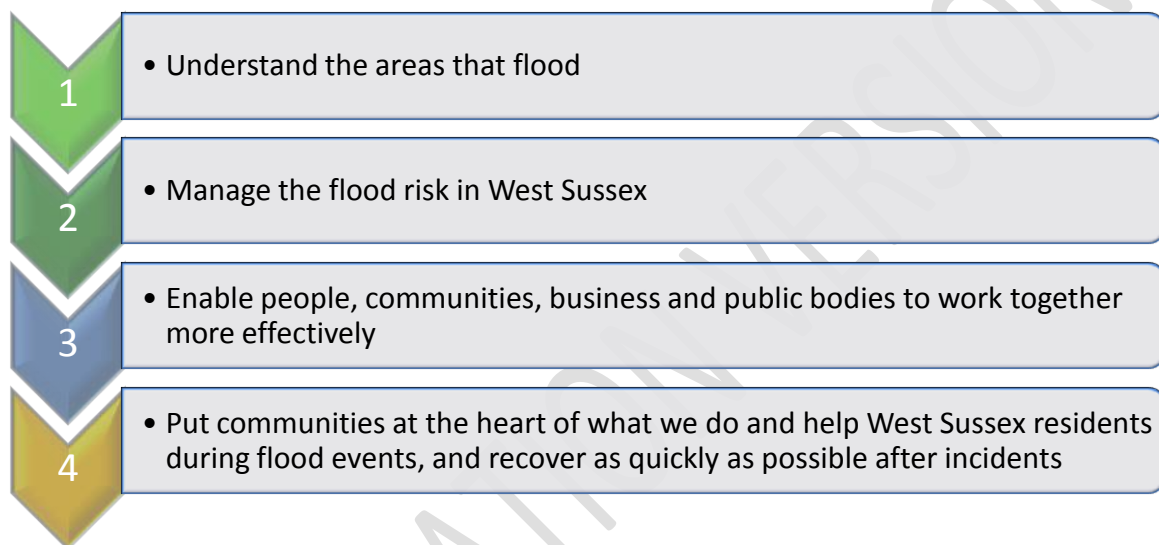
The Environment Agency's National Strategy objective is to take forward a risk based approach to flood risk management.



The overall aim is to ensure the risk from flooding and erosion is properly managed by using the full range of options in a coordinated way. To do this, communities, individuals and voluntary groups will need to work together to:

1. Manage the risk to people and their property;
2. Achieve environmental, social and economic benefits, consistent with the principles of sustainable development;
3. Facilitate decision-making and action at the appropriate level – individual, community, or local authority, river catchment, coastal cell or national.

As shown in the diagram taken from the National Strategy, the Government intends to work with organisations, communities and individuals. To reflect the Governments strategic objectives in the local context, West Sussex County Council propose county objectives to guide local focus and progress. These are to:



The local flood risk strategy intends to understand and summarise flood risk knowledge. Historical, current and future flood risk in West Sussex has been well documented in Environment Agency flood risk plans - Catchment Flood Management Plans and Shoreline Management Plans. The River Basin Management Plan required under the European Floods Directive, links our flood risk and water quality strategy. Other strategy level documents such as surface water management plans, tidal, coastal and river strategies provide further detail needed to define risk and scope options for improvement work. Our understanding of flood risk and what we need to do about it is drawn from these plans and strategies and this knowledge provides the basis for the programme of work identified by this local flood risk strategy.

Analysis of flood risk in this strategy has identified ‘wet spots’ in West Sussex. These are areas prone to flood. The substantial clusters of properties that are in flood risk areas have been identified so that the headline information on past management and future management can inform our decision making and investment. This strategy will collate the outstanding actions and projects from previous analysis to form a work programme that is agreed by the elected members of the Southern Regional Flood and Coastal Committee. The programme will enable future investment to be managed in a prioritised and organised

way. There will not be the resource to design, build and maintain every option. When funding is available, we will be able to act and reduce flood risk by carrying out the works.

Since 2010 flood risk has been managed jointly between a number of risk management authorities that includes West Sussex County Council, District and Borough Councils, the Environment Agency, Internal Drainage Boards, the Highways Agency and Southern Water. This strategy explains the role that each of these organisations play. To ensure flooding is managed in an integrated way across these organisations, the local flood risk strategy and work programme will be inclusive and consider all functions and sources of flooding. The intention of this is to recognise where flood risk responsibilities coincide, and where partnership working and jointly funded projects could be undertaken.

In times of austerity we will be actively looking to draw in funds from beneficiaries to boost the likelihood of projects going ahead. This will be a challenging task as commercial or private contributions will not be available everywhere. The document has been reviewed by, and is supported by, each risk management authority in the county.

West Sussex County Council as Lead Local Flood Authority are required to set out how to deliver local flood risk management under the Flood and Water Management Act. Strategic flood risk assessments, sustainable drainage systems approval, and ordinary watercourse consents each will play their part in managing development and local flood risk. The local strategy will explain how West Sussex County Council will perform these duties.

The strategy fully supports the existing planning processes and provides further evidence for directing development away from the floodplain. When building on the floodplain or in an area susceptible to surface water flooding, the strategy will guide planning authorities to seek contributions from developers for the required works in order to reduce flood risk to an acceptable level. Making this link at pre planning stage is vital in securing a sustainable future for West Sussex County Council and the residents of West Sussex.

We recognise the importance of forward planning, response and recovery. The June 2012 event tested West Sussex County Councils resilience along with other responders during one of the wettest periods on record. The local flood risk strategy will support the recommendations of the investigation into the summer 2012 flooding, and the associated improvements to planning, warning and recovery. The Flood Report on the June 2012 Flood Event is available on the West Sussex County Council website.

Prior to 2010 and the Flood and Water Management Act there were gaps in flood management responsibility. Stronger accountability now exists, and those responsible authorities are required to cooperate and share information. The local flood risk strategy provides the tools to allow joint progress. Tough decisions will need to be taken on priorities because there are not the funds to manage all flood risk across the county. It will not be possible to reduce flood risk to every property, but with the correct accountability in place outlined in this local flood risk strategy it will be possible to tackle prioritised issues and begin to make a difference.

Using the best information available the local strategy highlights the flood risk areas as 'wet spots'. In highlighting these more susceptible areas it is the intention to inform communities about flood risk that they may not be aware of. The wet spot locations will help focus investment where it is needed most in order to reduce the flood risk. Factors including vulnerability, deprivation, critical infrastructure and the impact to homes and businesses will be considered when selecting these areas.

It is the aim of this local strategy to oversee the direct reduction in flood risk for residents. This aim will be met by the projects that are taken forward in the work programme. The work programme is an evolving list. Investigations, new information, changing budgets and contributions, and subsequent flood events will alter what happens over the lifetime of the strategy. A review of progress will be conducted in future years so that we can monitor progress.

CONSULTATION VERSION

## Glossary and Acronyms

Term / Acronym	Definition
Category 1 responder	Those Category 1 responders are organisations at the core of the response to most emergencies (the emergency services, local authorities, NHS bodies). Category 1 responders are subject to the full set of civil protection duties.
CFMP	Catchment Flood Management Plans (CFMPs) give an overview of the flood risk across each river catchment. They recommend ways of managing those risks now and over the next 50-100 years.
CLG Department for Communities and Local Government	CLG was established in May 2006 (replacing the Office of the Deputy Prime Minister) and is responsible for building regulations, community cohesion, decentralisation, fire services and resilience, housing, local government, planning, race equality & urban regeneration. The Department works to move decision making power from central Government to local councils, helping put communities in charge of planning, increasing accountability, and enabling citizens to see how their money is being spent.
Cluster	A group or concentration of properties that may be affected by flooding. These properties are considered to be at risk of having internal damage from flooding.
Culvert	A culvert is a watercourse that has been enclosed in a structure such as a pipe.
Combined Sewer	A separate underground pipe system designed specifically for transporting sewage, excess rain and surface water from houses, commercial buildings and roads for treatment or disposal.
Defra	Department for Environment, Food and Rural Affairs.
Flood Defence Grant in Aid (FDGiA)	Flood Defence Grant in Aid is the central funding pot of Defra (The Department of Food and Rural Affairs) that is spent each year on flood risk reduction measures.
Flood Map	The Flood Map is a multi-layered map which provides information on flooding from rivers and the sea for England and Wales. The Flood Map also has information on flood defences and the areas benefiting from those flood defences. The flood zones do not take into account flood defences.
Fluvial flooding (River flooding)	Flooding resulting from water levels exceeding the bank level of a river or stream.
Flood and Water management Act (FWMA)	Flood and Water Management Act 2010. The FWMA implements the recommendations from Sir Michel Pitt's Review of the floods in 2007 and places a series of responsibilities on the council. The main aim of the Act is to improve flood risk management.
Groundwater flooding	Flooding that occurs when water levels in the ground rise above surface levels. Most likely to occur in areas underlain by permeable geology.
Internal Drainage Boards (IDBs)	An Internal Drainage Board is a public body that has been established under statute in areas of special drainage need. An IDB holds permissive powers to undertake work to deal with matters affecting water levels, land drainage and flood risk within a defined boundary.
Lead Local	Lead Local Flood Authority – Local Authority (upper or unitary council) responsible for taking the lead on local flood risk management. In this

Flood Authority (LLFA)	area it is West Sussex County Council.
'Local' flood risk	Local flood risk is defined as flooding from surface water, groundwater and ordinary watercourses. If other sources of flood risk (river or sea risk for example) interact with local sources it is common for everything to be considered together. This Local Strategy considers all types of flooding.
Local Levy	Local level is a funding pot governed by the Southern Regional Flood and Coastal Committees for flood alleviation schemes.
Main river	The Environment Agency is the lead authority on main rivers. Main rivers are a Defra statutory designation and are identified on the Environment Agency's 'Main River Map'. The Environment Agency has permissive powers to carry out work on main rivers.
NAFRA (Environment Agency)	The NaFRA includes flooding from all rivers with a catchment size greater than 3 km <sup>2</sup> , and all flooding from the sea (both along the open coast and tidal estuaries). Smaller rivers are included in the assessment where they fall within the area that could be affected by an extreme flood (0.1% chance in any year). It does not include other forms of flooding such as from highway drains, sewers, overland flow or rising groundwater. The assessment takes into account the type, location and condition of flood defences.
National Strategy	The Flood and Water Management Act 2010 required the Environment Agency to develop, maintain and apply a strategy, describing what needs to be done by all authorities involved.
Ordinary Watercourse	The Lead Local Flood Authority is the lead authority on ordinary watercourse, they have permissive powers to carry out flood defence works. All watercourses that are not designated Main River are considered to be ordinary watercourses and are the responsibility of landowners. Note, ordinary watercourse does not imply a "small" river, although it is often the case that Ordinary Watercourses are smaller than Main Rivers.
Preliminary Flood Risk Assessment. (PFRA)	The PFRA provides a high-level summary of significant flood risk, based on available information, describing both the probability and consequences of past and future flooding. A PFRA must consider flooding from surface runoff, groundwater and ordinary watercourses, and any interaction these sources may have with main rivers.
Pitt Review	Comprehensive independent review of the 2007 summer floods by Sir Michael Pitt, which provided recommendations to improve flood risk management in England.
Property level protection (PLP)	PLP is a term used to refer to resistance measures that slow down or stop the ingress of water to a property. Examples include door-boards, airbrick covers and one-way valves.
Riparian Owner	If you own land or property next to a watercourse i.e. a river, stream, culvert or ditch, then you are a 'riparian landowner' and have riparian responsibilities.
Risk	In flood risk management, risk is defined as a product of the probability or likelihood of a flood occurring, and the consequence of the flood.
Sewer flooding	Flooding caused by a blockage or overflow in a sewer or urban drainage system.
South East Seven (SE7)	A working group of Local Authorities with common interests that includes Kent, East Sussex, West Sussex, Hampshire, Medway, Surrey, Brighton & Hove.

RFCC	Southern Regional Flood and Coastal Committee (RFCC) and Thames Regional Flood and Coastal Committee are groups of elected members responsible for scrutinising and signing off the work programme.
SMP	Shoreline Management Plans (SMPs) provide a long-term framework for dealing with coastal flooding and erosion over a large area. SMPs take into account risks to people and the developed, historic and natural environment. They also take climate change into account in planning long-term coastal management.
SuDS	Sustainable Drainage System. A drainage system designed to control surface water runoff close to where it falls and mimic natural drainage as closely as possible.
Surface Water	Rainwater (including snow and other precipitation) which is on the surface of the ground (whether or not it is moving), and has not entered a watercourse, drainage system or public sewer.
Surface Water Management Plan (SWMP)	Surface water management plans are projects to investigate local flooding issues such as flooding from sewers, drains, groundwater, and runoff from land, small watercourses and ditches that occurs as a result of heavy rainfall.
The council	West Sussex County Council
'The strategy' & 'the local strategy'	This document, the Local Flood Risk Management Strategy for West Sussex County Council.
West Sussex Strategic Flood Risk Management Board	Made up of senior officers from WSCC, all Borough and District Councils, EA and Southern Water. The group's role is to take a strategic overview of the entirety of flood risk and drainage management across West Sussex.
West Sussex Flood Risk Management Group	The group comprises WSCC, the EA (Southern & Thames), Southern Water Services and all the Borough and District Councils within West Sussex. Its role is to plan and act to reduce the risk and consequence of flooding now and in the future in West Sussex.
Wet Spots	Strategy has focused on cluster areas of properties at risk. These are identified by the latest flood risk mapping and are referred to as 'wet spots'
WSUD Water Sensitive Urban Design	Water-sensitive urban design (WSUD) is a land planning and engineering design approach which integrates the urban water cycle, including storm water, groundwater and wastewater management and water supply, into urban design to minimise environmental degradation and improve aesthetic and recreational appeal.

# Chapter 1

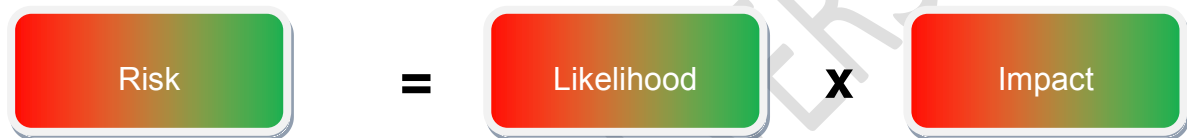
## West Sussex Flood Risk

### What is flood risk?

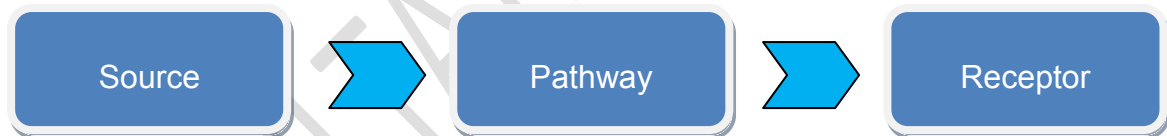
Flooding is a hazard as it has the potential to cause harm to human health and life, and effect the natural and built environment.

The term 'risk' acknowledges the actual harm caused and is different to a hazard.

Flood Risk is a combination of the probability/likelihood of a flood event occurring and the severity of its impacts:



Flooding is only a risk when flood water affects people, property or agricultural land (the receptor).



Risk captures the severity of, or related consequences produced by, a flood event. Impacts can be social, economic and environmental, for example the number of properties flooded and the level of associated economic damages. The consequences of a flood depend on the level of exposure and the vulnerability of those affected.

### What is the likelihood of this happening and what does this mean?

Flood risk is often measured by a percentage probability or by stating how regularly it will occur. The industry refers to 1% annual probability floods, and, 1 in 200 year floods, for example. This does not mean that they only happen every 200 years. We may see two within a year, but then not for another 250 years. We may also any number of smaller flood events between the larger events.

To interpret this information in another way, the Bognor Regis rainfall event in June 2012 saw over 10cm of rain fall in 24 hours. This area may see 60cm annually. In Bognor Regis, this downpour equated to a 1 in 200 year rainfall event, or a 0.5 % annual probability event.

In other words it was a very rare event. These rainfall events can consist of torrential rain over a short period of time, or, prolonged showers over a longer period. The important factors are the amount of rain that has fallen, and over how much time.

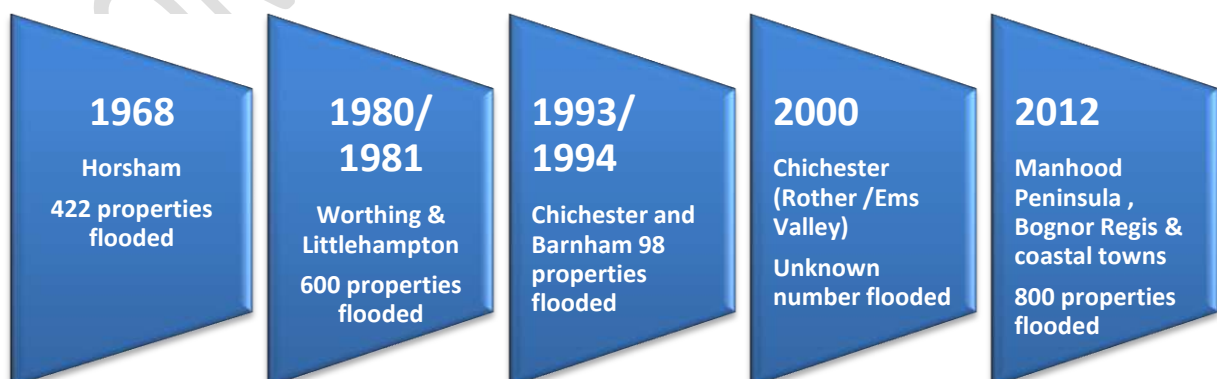
Rainfall rates vary greatly from one town to another. In 2012 Bognor Regis recorded over 10cm in 24 hours, whereas inland at Itchingfield and Haywards Heath the total were much less. It is important to interpret the flood risk maps with this in mind, because they model a uniform 'Bognor Regis 2012' rainfall occurring everywhere in county at the same time. This is necessary to see where we might experience the biggest problems, which will inform our work programme. In reality it is more likely we will see certain towns flooded as predicted in the flood maps, and others that received less rainfall, to a much lesser extent.

Most drainage systems and flood defences are designed to protect against a certain size event occurring. The dilemma in flood risk management is how much do you over engineer your design to account for very rare events. Do you spend an extra £100,000 to build the best defence for one community, protecting against 15cm of rain falling in 24 hours, or, do you build two defences for two communities, both protecting to 5cm of rain falling in 24 hours. These are the cost benefit choices that risk management authorities take.

## What is the flood risk within the county?

### Historic flood events

West Sussex has a history of fluvial, coastal, surface water and groundwater flooding. There are records that extend back hundreds of years shown in previous research from our archives provided by the fire brigade, media, academic papers, and the British Hydrological Survey. Often it is difficult to compare different events because the towns and rivers have been modified over time, and statistical information can be incomplete. The historic flood events that have occurred since 1968, and caused approximately 100 or more properties to flood, are shown in the diagram below. Hundreds of other smaller flood events have been recorded across the county from a range of flood risk sources. Some events affected properties, others just roads, and in some instances the information does not specify.

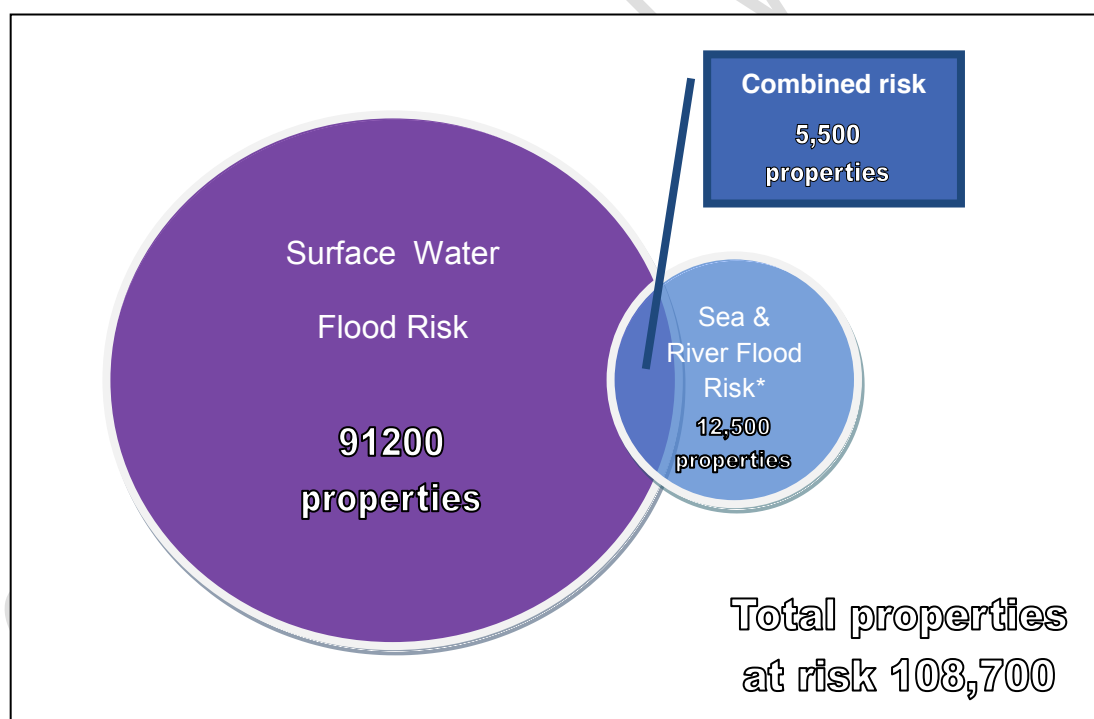


Flooding occurs naturally within West Sussex at many locations. To identify these areas in the county existing plans and the latest flood risk mapping has been reviewed. It is not possible to prevent all flooding but we will work closely with our partners to manage the impact on our communities.

The property counts in Figure 1 are derived from the West Sussex Preliminary Flood Risk Assessment (PRFA 2011) and latest flood risk mapping from the Environment Agency (the National Flood Risk Assessment - Nafra 2008/09).

76,600 residential properties and 20,100 businesses were identified as being within susceptible surface water flood risk areas in the PFRA. 15,000 residential properties, and 3,000 businesses are within areas at risk from rivers or sea flooding (Environment Agency Nafra 2008/09, counting moderate and significant risk). 5,500 of these residential and business properties fall within both sets of mapping and are susceptible to either source of flooding.

The best available mapping indicates that over 100,000 properties are in areas susceptible to flood risk within the county.



**Figure 1: Properties at risk in the county by flooding source** (these figures includes flats above ground floor level that would be indirectly effected, \*counting properties and businesses at moderate and significant sea and river flood risk)

The flood risk in West Sussex can be attributed to the sea, rivers, watercourses, ditches, rifes, sewers, groundwater and from surface water. Irrespective of the source of the water,

the result and impact on a property or on a community is still the same. Flood damage is expensive and can take time to repair.

If you are responsible for managing flood risk, the source of flooding is very important in order to understand the solution. To manage flood risk an assessment should identify the source the water so that options for management and a solution can be considered.

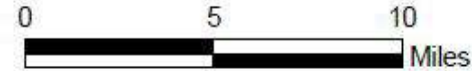
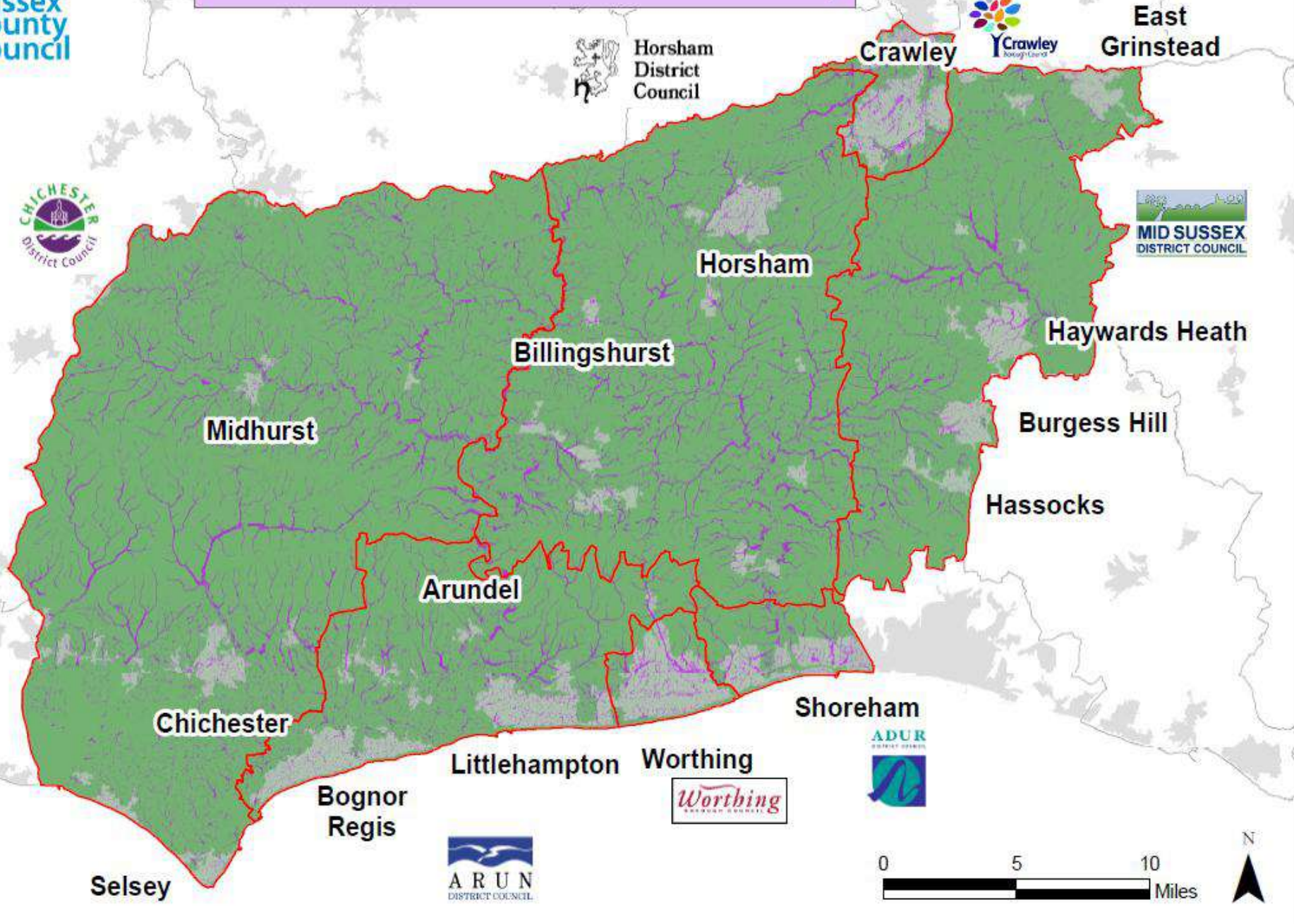
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**Figure 2: The West Sussex Surface Water Flood Map, showing the extent of surface water flooding from a 1 in 200 year rainfall event**

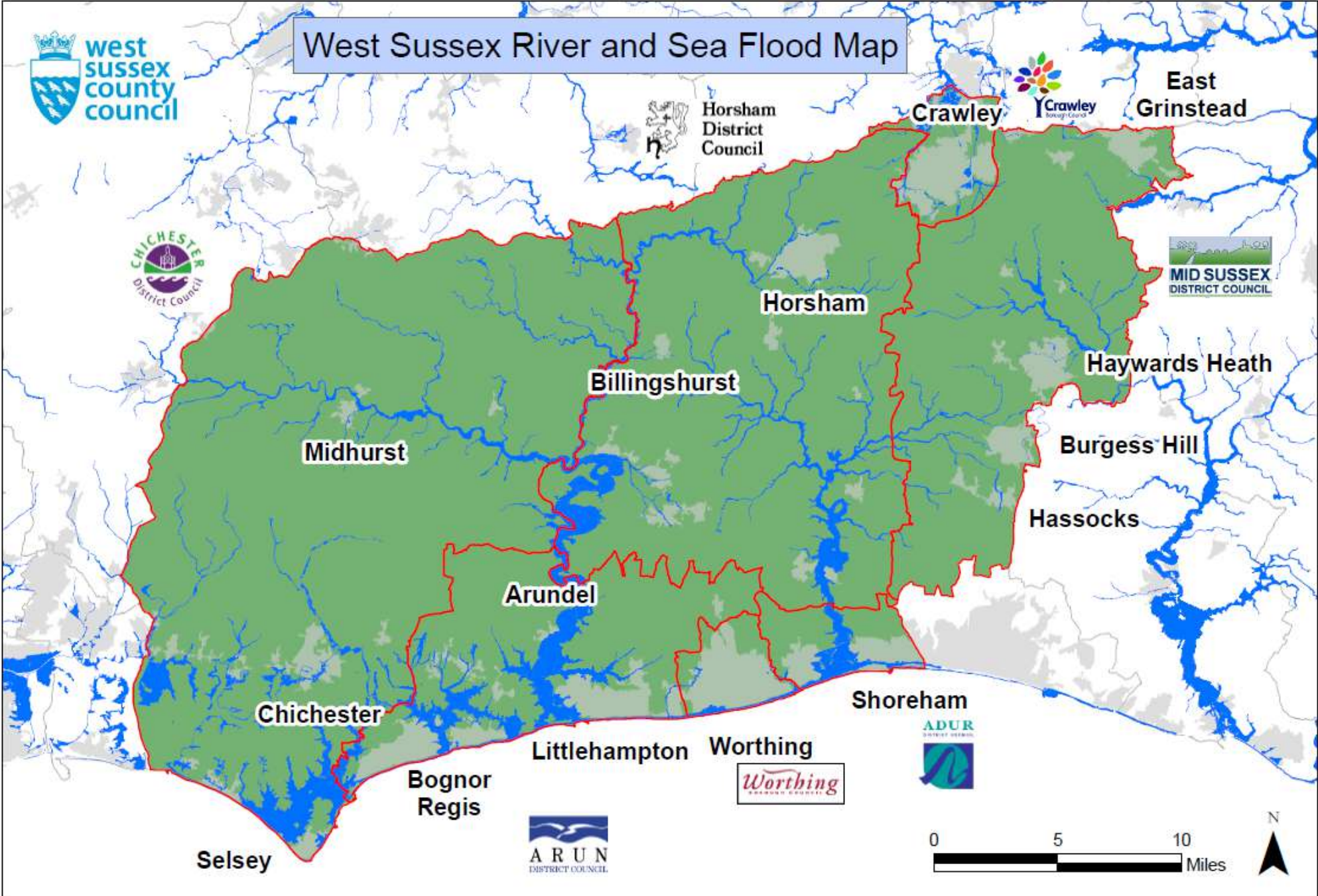
**Figure 3: The West Sussex River and Sea Flood Map, showing the extent of river and sea flooding from a 1 in 200 year river event, and 1 in 200 year sea event (The Environment Agency Flood Map, not accounting for defences)**



# West Sussex Surface Water Flood Map



# West Sussex River and Sea Flood Map



## Surface Water Flooding

Surface water flooding results from excess overland flow and ponding. This can be caused by intense short duration storms or by any storm when the ground is already saturated. Surface water can collect naturally when the ground cannot absorb any more water. Within the built environment surface water can collect more easily because the water cannot infiltrate the ground like it would do naturally. In the urban environment and on highways water is funnelled into pipes and sewers, and when the drainage network blocks or when sewer capacity is exceeded, flooding occurs. It is difficult to predict if, where and when it will occur.

The areas that are most susceptible are the urban areas including Shoreham, Lancing, Worthing, Crawley, Horsham, Bognor Regis, Felpham, Elmer, Berstead, Middleton, Bosham, Selsey, Birdham, Pulborough, Burgess Hill and Haywards Heath. Surface water flooding is not restricted to urban areas and can occur in rural areas when drainage is prevented by blockages or saturated ground. Surface water has contributed significantly to flooding experienced in the county recently. Three Surface Water Management Plans are currently underway in West Sussex. These plans will identify improvement actions that will be included on the local strategy work programme. Future Surface Water Management Plans are expected to be carried out within West Sussex depending on funding and priority (proposed at North Lancing, Manhood Peninsula, Bognor, Horsham, Haywards Heath and Shoreham) and are included in the work programme (Appendix D).

- Elmer Sands Surface Water Management Plan
- Worthing Surface Water Management Plan
- Lidsey (Waste Water Treatment Works) Catchment Surface Water Management Plan

## Groundwater Flooding

Groundwater flooding can occur when groundwater rises up from an underlying aquifer to flood subsurface infrastructure or to emerge at the ground surface. This type of flooding is generally caused by rising groundwater levels in permeable aquifers (primarily chalk in West Sussex) in response to prolonged above average rainfall or from high water levels in adjacent rivers. Due to the chalk geology running across West Sussex, the lower slopes of the South Downs are the area's most susceptible to experience this type of flooding. This can affect the areas in the upper reaches of the River Lavant (Singleton, East Dean and Charlton), Bosham Stream (Woodend, Funtington), River Ems (Walderton, Stoughton), and North Lancing and Durrington.

## Ordinary Watercourse Flooding

An ordinary watercourse is any watercourse (river, stream, ditch, cut, sluice, dyke or non-public sewer) that is not identified as a Main River. Flooding can occur from an ordinary watercourse overtopping its bank level or culverts becoming blocked. Ordinary watercourses in West Sussex are managed by West Sussex County Council, four Internal

Drainage Boards and riparian landowners. The IDBs have a schedule of works. Similarly, the riparian owners have responsibilities to maintain their stretch of watercourse. The Districts and Borough Councils undertake consenting and enforcement. This is to ensure that work on ordinary watercourses is checked, approved, and that appropriate action is taken against landowners who undertake unconsented works or fail to carry out their responsibilities.

## **Coastal and Tidal Flooding**

The coastline in West Sussex stretches from Emsworth to Portslade. High water caused by the tide, waves and storm surges can cause flooding to occur. Generally, where urban areas meet the coast the line is defended (Selsey, Shoreham, Worthing, Littlehampton, Bognor), and where there is no property the coastline is left in a natural state. Areas at particular flood risk are the harbours and estuary areas. The Environment Agency and Local Authorities manage the flood risk to coastal properties by managing the groynes and sea walls, replenishing the beach material and by maintaining the natural beach defence. Shoreline Management Plans govern the strategic management of the coastline. Investment is largely directed by coastal risk and erosion strategies that analyse the detail and consider project options. Within West Sussex there are currently seven strategies in progress or completed for coastal and tidal risk. These are:

- Arun to Pagham Strategy
- Arun to Adur Strategy
- Pagham to East Head Strategy
- Emsworth to East Head Strategy
- Shoreham to Brighton Marina Strategy
- Lower Tidal River Arun Strategy
- Pagham Harbour Adaptive Management Study

The work programme (Appendix D) that this local flood risk strategy proposes will use the outputs of these strategies so that the full picture of investment into flood risk is understood within the county.

## **Main River Flooding**

Main rivers are defined by Defra and constitute important watercourses that carry significant flood risk. The Environment Agency have powers to undertake works on these rivers. The major river catchments in West Sussex are the River Arun, the River Adur and a number smaller watercourses that make up the West Sussex Rifes. Part of the River Mole catchment that drains north into the River Thames also falls within West Sussex. The River Arun and the River Adur both flow south through the county and discharge into the English Channel at Littlehampton and Shoreham.

River flooding can impact a number of West Sussex towns including Arundel, Bognor Regis, Chichester, Littlehampton, Shoreham and Crawley. The rivers drain on average 600mm of annual rainfall. Heavy rainfall can cause rivers to overtop their banks and spill onto the

floodplain. The characteristics of the catchments are dominated by their topography, with fast flowing streams emerging from the high Weald to the north, flowing into a low lying coastal plain where the gradient is less and the river flows are much slower. The flood risk on rivers is managed strategically by Catchment Flood Management Plans. The local strategy work programme includes work not yet started from these plans:

- The Arun Catchment Flood Management Plan
- The Ouse Catchment Flood Management Plan
- The Adur Catchment Flood Management Plan
- The Thames Catchment Flood Management Plan
- The Lower Tidal River Arun Strategy

## **Reservoir Flooding**

The Government recognises that a major reservoir flood event could have a significant impact on the downstream area. Reservoirs in the UK have an extremely good safety record with no incidents resulting in the loss of life since 1925. Reservoirs are carefully maintained meaning flooding is very unlikely to happen.

The Environment Agency oversees reservoir safety and enforces the Reservoirs Act 1975 and is responsible as an enforcement authority for some 2,000 reservoirs in England and Wales. All large reservoirs must be inspected and supervised. The Environment Agency ensures that reservoirs are regularly inspected and essential safety work is carried out.

There are two large reservoirs in West Sussex at Ardingly and Weir Wood. Local Resilience Forums (LRFs) undertake the planning and engagement with downstream communities. The Pitt Report recommended that communities be provided with reservoir flood maps to enable the emergency services and other responders to assess risks and plan for contingency, warning and evacuation.

## **Sewer Flooding**

Foul sewers carry flows from business and domestic water use, for example kitchen and bathroom waste, to a wastewater (sewage) treatment works. Treated effluent is then discharged to the environment (a local watercourse or the sea) under a consent granted by the Environment Agency. Foul sewers can surcharge due to groundwater or surface water infiltration. This can cause foul flooding which is particularly unpleasant.

Surface water sewers carry rainwater to a suitable discharge point such as a local watercourse or the sea. These discharges do not generally require treatment or a licence from the Environment Agency. Sewer flooding occurs when an increase in the amount of rainwater entering the system causes surcharging. This is most likely to occur where the sewer has a dual purpose, carrying both surface water run-off and foul sewerage.

Investment to improve the sewer network happens as part of the periodic price review that sets aside an agreed amount to be spent on reducing flood risk. Areas previously known to have experienced regular sewer flooding are Worthing, Durrington, Barnham, North Lancing, Shoreham and Burgess Hill. Problems can also occur along the base of the South Downs because when water levels are high sewers the overspill drains into local watercourses. The next water company price review is being agreed by Government before 2014. This will determine investment to the sewer infrastructure over the next 5 years. Water Companies can contribute to flood risk projects being proposed by the Lead Local Flood Authority.



## Areas susceptible to flooding - the wet spots in West Sussex

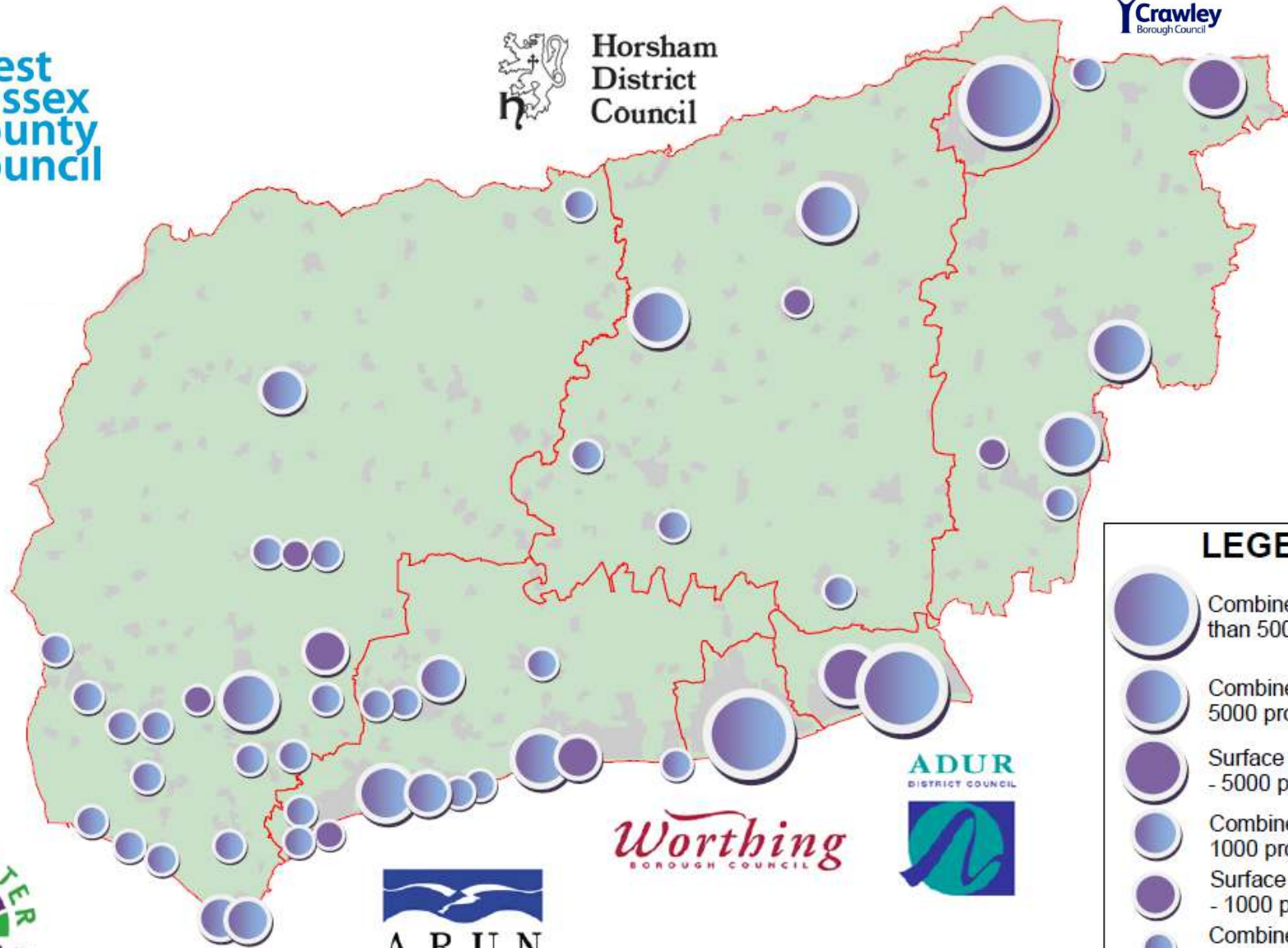
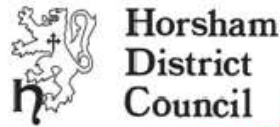
Each area susceptible to flood risk has a corresponding map, this forms Appendix (B). Each community is illustrated showing the best available mapping surface and river and sea flooding areas. Figure 4 shows the size of the risk in terms of the quantity of housing with risk areas, and, whether the main risk is from surface water, from the rivers and the sea, or from a combination of sources.

The distribution of the wet spots in West Sussex is driven by three main factors. The concentration of wet spots is weighted in Chichester District due to the low lying land of the coastal plain. The other major risk areas are the large inland towns where surface water flooding, river flooding or a combination of both can cause property to flood. Thirdly, the coastal strip of communities form a row of urban areas that are affected by the tides and the draining of water from inland.

**Over page**

**Figure 4: The West Sussex 'Wet Spot' Flood Map**

# West Sussex "Wet Spot" Flood Map



## LEGEND

- Combined risk greater than 5000 properties
- Combined risk 1000 - 5000 properties
- Surface Water risk 1000 - 5000 properties
- Combined risk 500 - 1000 properties
- Surface Water risk 500 - 1000 properties
- Combined risk less than 500 properties
- Surface Water risk less than 500 properties



West Sussex County Council have identified 53 'wet spot' areas in the county. Wet spots have been classified as areas where a significant number (generally greater than ten properties and/or businesses) of adjacent properties may be susceptible to flooding. These property counts include flats above ground floor level. These locations have been highlighted in previous plans, notably Catchment Flood Management Plans, Shoreline Management Plans, the Preliminary Flood Risk Assessment and the Flood Report (Nov 2012).

The locations are listed in Figure 5 alphabetically. Numbers of properties are reported according to which flood map they fall within (Figures 2 and 3 on page 18 and 19). Some properties fall within both maps, and are counted as 'combined risk' in the dark blue column in Figure 5. To help the reader understand what this table is illustrating it is necessary to read the 'What is the likelihood of this happening and what does this mean?' section on page 14. A more detailed explanation about the assessment is made on page 29. The flood risk has been assessed by considering the following size flood events:

- Surface water flooding assessed from a 1 in 200 year rainfall event (0.5% annual probability rain fall event), the surface mapping simulates flooding accounting for drainage and the build environment;
- River flooding assessed from a 1 in 200 year flood event (0.5% annual probability river flood event), the river flooding mapping simulates flooding including the current benefit from drainage and defences;
- Sea flooding assessed from a 1 in 200 year flood event (0.5% annual probability sea flood event), the sea flooding mapping simulates flooding including the current benefit from drainage and defences.

**Figure 5: The West Sussex 'Wet Spot' areas and the number of residential properties and businesses susceptible to flood risk by flood source (including flats above ground floor level)**

Community	Area	Surface Water Flood Risk* (no. of properties)	River and Sea Flood Risk* (no of properties)	Combined Flood Risk* (no. of properties)	TOTAL (no. of properties)
		* property within surface water risk map	* property within river/sea risk map	* property within both surface & river/sea water risk maps	
Aldingbourne, Westergate & Eastergate	Arun District	300	110	85	495
Aldwick Bay	Arun District	275	0	0	275

Angmering	Arun District	550	5	60	615
Arundel	Arun District	215	15	0	230
Barnham & Walberton	Arun District	400	200	100	700
Billingshurst	Horsham District	600	0	25	625
Birdham	Chichester District	25	0	0	25
Bognor Regis & Felpham	Arun District	900	1200	200	2300
Bosham	Chichester District	50	100	0	150
Bramber & Upper Beeding	Horsham District	325	60	0	385
Burgess Hill	Mid Sussex District	2500	1	0	2501
Charlton	Chichester District	25	0	10	35
Chichester	Chichester District	1750	385	95	2230
Chidham	Chichester District	15	15	10	40
Copthorne	Mid Sussex District	75	130	75	280
Crawley	Crawley Borough	9000	625	425	10050
Earnley & Bracklesham	Chichester District	50	145	0	195
East Dean	Chichester District	30	0	1	31
East Grinstead	Mid Sussex District	2200	0	0	2200
East Preston	Arun District	400	0	0	400

East Wittering	Chichester District	25	145	25	195
Ferring Coast & Rife	Arun District	30	0	60	90
Fishbourne	Chichester District	180	5	0	185
Hassocks	Mid Sussex District	525	105	55	685
Haywards Heath & Lindfield	Mid Sussex District	2200	0	100	2300
Horsham	Horsham District	4000	0	0	4000
Hunston	Chichester District	35	5	0	40
Littlehampton	Arun District	1200	1200	240	2640
Littlehampton West & Climping	Arun District	35	180	10	225
Loxwood	Chichester District	55	5	5	65
Middleton-on-Sea & Elmer	Arun District	150	295	25	470
Midhurst	Chichester District	600	30	35	665
North Mundham & Runcton	Chichester District	20	30	5	55
Oving	Chichester District	50	1	0	51
Pagham & Nyetimber	Arun District	170	145	35	350
Pulborough	Horsham District	325	0	10	335
Rustington	Arun District	550	0	0	550
Sayers Common	Mid Sussex District	50	0	0	50

Selsey (West)	Chichester District	350	150	30	530
Selsey East	Chichester District	300	525	50	875
Shoreham & Lancing	Adur District	4500	2400	650	7550
Sidlesham	Chichester District	55	145	5	205
Singleton	Chichester District	75	0	15	90
Sompting	Adur District	1100	0	0	1100
Southbourne, Hermitage & Nutbourne	Chichester District	200	105	35	340
Southwater	Horsham District	700	0	0	700
Storrington	Horsham District	525	0	25	550
Tangmere & Boxgrove	Chichester District	350	0	0	350
Thorney	Chichester District	25	145	0	170
West Itchenor	Chichester District	10	15	5	30
West Wittering	Chichester District	55	1	0	56
Westbourne	Chichester District	250	0	10	260
Worthing	Worthing Borough	8750	1350	300	10400

Data from each of the seven Districts and Boroughs has been considered. Mapping has been produced (Appendix B) to show where areas susceptible to flooding exist. The maps indicate the main risk from surface water, the rivers and the sea. For the purposes of this Strategy the Environment Agency's groundwater map has been considered but is not published in the mapped communities. The wet spots have been selected to include those areas that are susceptible to groundwater flooding, and the property count of the surface water statistic's can be taken to include groundwater risk areas.

The wet spots identified across the county are linked to actions in the work programme so that West Sussex County Council can track progress and the location of investment over the lifetime of the strategy. Significant existing flood risk projects or historic flood risk management is also referenced by wet spot so that improvements already undertaken can be understood.

The method of identifying wet spots uses the best available mapping that exists, and the most recent flood reports. These two sources provide the basis for identifying the highest risk areas. There are many isolated properties at flood risk in the county that are outside of these cluster areas. The Strategy has focused on cluster areas because funding for projects requires a high cost benefit ratio that is generally not met by single property projects. The Local Strategy does support property level protection measures by householders, work currently being considered in the Flood Resilience Community Pathfinder Scheme.

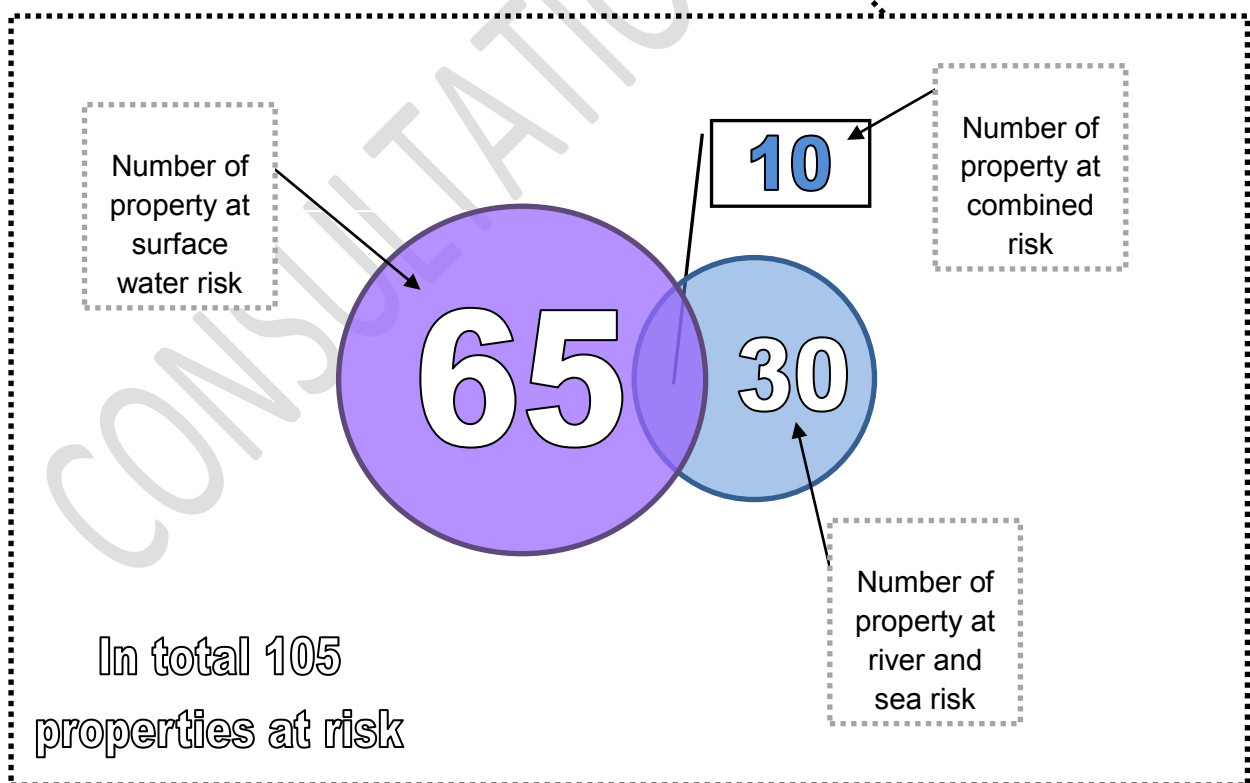
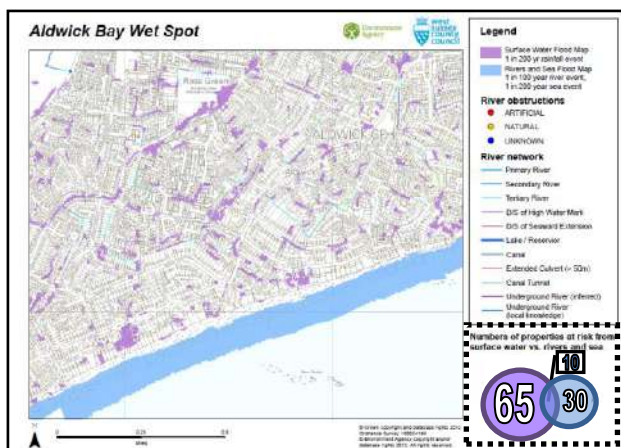
By focussing on these wet spots alone we will ignore the risk faced by the county's rural and dispersed communities. Issues will be identified through the Council's new flood investigatory role and ordinary watercourse consenting and enforcement responsibilities. The other Risk Management Authorities, local flood groups or parish councils should also bring flooding and maintenance issues to the attention of West Sussex County Council as Lead Local Flood Authority.

All of the wet spot areas feature in the West Sussex Preliminary Flood Risk Assessment (PFRA), and in the West Sussex County Council Report on June 2012 Flood Event (Nov 2012). They include all areas at risk from river and sea flooding as identified by the latest Environment Agency flood mapping. The wet spots have been considered by local experts at the District and Borough level, the County Council, Southern Water and by the Environment Agency. Historic events and previous flooding issues have been taken into account and have contributed to the West Sussex wet spot list.

The purple column represents property numbers at surface water flood risk. This is flood risk posed from rainfall that is yet to reach a natural channel or sewer (the model accounts for drainage and buildings). The light blue column represents property at river and sea risk. This is flood risk posed from rivers bursting their banks and from sea storms, surges and high tides (the model accounts for sea and river defences). The combined column (dark blue) represents the property at risk from both sources. The total risk for the community equals to each number summed (in Figure 6 this is  $65 + 30 + 10 = 105$  properties at risk). The numbers of properties are derived from address data and have been rounded to the nearest five properties, except where less than five properties are at risk.

The purple and light blue areas are areas susceptible to flood risk. There are shown on each wet spot map reflect where the flood risk exists, and why the area was identified as having clusters of properties within risk areas. Information shown on the maps includes the river obstructions such as weirs, dams, and the drainage network of rivers, canals and lakes. In the map shown, the diagram in the bottom right shows that 65 properties are in areas susceptible to surface water flood risk (1 in 200 year rainfall event), 30 properties are at risk from a 1 in 200 year (0.5% annual probability) river or 1 in 200 (0.5% annual probability) sea event, and 10 properties are at risk from both sources.

**Figure 6: The appendix B 'Wet Spot' Flood Map Information**



## Horsham District

The Horsham District contains six wet spots that are susceptible to surface water and river flooding; Horsham, Pulborough, Storrington, Southwater, Bramber & Upper Beeding and Billingshurst. Surface water flood risk poses the most likely flood risk in each of these areas. Horsham represents the largest cluster of properties in areas susceptible to flooding from a rare rainfall event. Storrington and Southwater are susceptible to surface water flooding, and to a lesser extent Billingshurst and Pulborough. River flooding contributes to the surface water flood risk in Beeding and Bramber.

These wet spot areas are set within the Weald of Sussex underlain by sandstone and mudstone geology, and are drained by the urban sewer network and the River Arun and Rother. Serious flooding would only be expected during large-scale infrequent rainfall events, when overland flow would occur from rapid runoff and with a short response time. Flooding would occur from excess surface water run-off that cannot drain, and to a lesser degree from inundation directly from the local watercourses. The main rivers through urban areas are mainly undefended but some walls and channel straightening has occurred. The urban drainage network is maintained routinely and on a reactive basis to ensure surface water can drain.

## Arun District

The Arun District contains thirteen wet spots that are susceptible to surface water, river water and sea flooding. These areas stretch across the coastal plain from Ferring in the east to Pagham in the west. Bognor Regis & Felpham (river and sea) and Littlehampton (surface water risk, river and sea) contain the highest numbers at risk. Middleton-on-Sea & Elmer on the coastal plain include significant property numbers at risk from the sea should a extreme event occur. Barnham & Walberton, and Angmering have high property numbers at risk from surface water flooding and from combined sources.

The area is generally low lying topography with poorly drained and often waterlogged soils. The River Arun flows south through the centre of the district, with the Aldingbourne Rife, Ferring Rife, and Elmer Rife, and the upper parts of the Pagham Rife further draining the district. Some streams are tide locked as they drain into the English Channel. The characteristics of the district mean that surface water ponding and water logging due to high groundwater or extreme rainfall events can cause flooding. Groundwater flooding can also occur along a spring line across the coastal plain. Tide locking, under capacity or blockages within the drainage network also cause flooding. The key management of flooding in the district is the coastal protection works, the maintenance of embankments and walls on the River Arun, and the work that maintains sufficient flow in the rivers, watercourses, ditches and urban drainage network.



## Adur District

The Adur District contains the Shoreham-by-Sea & Lancing and Sompting wet spots. Both contain significant property numbers that are at risk of flooding from combined sources (river, sea and surface water flooding). Together over 7000 properties are in risk areas, largely from surface water flooding, but added to significantly by sea flooding.

The area is predominantly urban, underlain by chalk geology with a flat topography. The wet spots are heavily influenced by the tides alone, and can overtop due to purely tidal or tidal and fluvial influence. The Adur is unlikely to overtop from just heavy rainfall, but a combination of a heavy rainfall event and a high tide could cause significant flooding. Surface water flooding generated by run-off from the South Downs can cause flooding to property in Lancing and Sompting, the airport and West Beach Estate. The key flood risk assets in the District include the existing Adur tidal wall embankments, and the coastal defences that afford Shoreham and Lancing protection. The District maintains the Lancing Brook network. The Internal Drainage Board and the Environment Agency carries out channel maintenance work on local watercourses north of the A27 to maintain good flow.

## Worthing District

Worthing District contains the Worthing wet spot covering the low lying coastal urban area. The flood risk in Worthing is posed largely by surface water. If an extreme rainfall event was to occur thousands of properties would be in risk areas in the town. Only in a very rare tidal and storm event would Worthing be expected flood from the sea.

Worthing District is largely urban and is bordered either side by the Ferring Rife and Teville Stream floodplains. The underlying geology is comprised mostly of chalk and clays. The risk of flooding is posed from a combination of groundwater, sewer, surface water run-off and coastal wave overtopping. Drainage is comprised of rainfall run-off from the South Downs and rainfall that falls on the urban area. When either or both of these inputs are high then flooding to property can occur. The low lying coastal fringe of Worthing is at risk of flooding from the sea. When groundwater is high Goring and Durrington can be susceptible to flooding. Surface water contributes significantly to the flood risk in Worthing due the urban nature of the area, and due to the drainage being compounded high tides, groundwater or blockages.



## Chichester District

Chichester District has 24 wet spots susceptible to flooding from surface water, groundwater, sea and river flooding. The most significant risk is in Chichester from surface water and combined sources. Many clusters of properties in coastal and surface water risk areas exist across the Manhood Peninsula, rural Chichester Harbour area and south of the Downs. The population at risk is significantly higher during the holiday season.

In the north of the district the River Rother drains the Low Weald rural area from west to east through Midhurst. Midhurst is mainly at risk from surface water flooding. In the south of the district the groundwater fed River Lavant drains through Chichester. When groundwater levels are high, this wet spot can flood from a combination of the river, surface water and drainage network pinch points. The area can become seasonally water logged causing surface water ponding due to the low lying topography and high water table. Groundwater flooding occurs most regularly through the Lavant valley, notably at Charlton, East Dean and Singleton.

Channel maintenance is carried out by the Internal Drainage Board and the Environment Agency in the district. The main flood defence features are the diversion channel at Chichester, channel clearance and pumped drainage from the peninsula, and the flapped drainage through the coastal defences.



## Mid Sussex District

Mid Sussex contains 6 significant clusters of properties that are at risk of flooding. These are Burgess Hill, Copthorne, Hassocks, Hayward's Heath & Lindfield, East Grinstead, and Sayers Common. The most significant clusters of properties are located in the urban centres, particularly Haywards Heath and Burgess Hill. Purely surface water flooding is known to exist in East Grinstead and on a smaller scale in Sayers Common. Properties are largely at risk from surface water flooding Hassocks.

In the centre of the District the River Ouse drains east into neighbouring Lewes District, and in the south, the Adur drains west into Horsham District. Brighton and Hove borders Mid Sussex to the South. The villages and isolated properties in the rural landscape of Mid Sussex are generally at low flood risk. It is the urban areas that are more susceptible to flooding where surface water flooding, urban drainage problems and ordinary watercourses flooding pose a risk to property. Heavy rainfall events can cause flooding in these areas. The defences in the District consist of a mixture of maintained and culverted channels. These defences are maintained and activities include grass cutting, weed cutting and debris clearance carried out by the Environment Agency and Local Authority.



## Crawley

Crawley has one wet spot made up of the urban area susceptible to surface water flood risk. This wet spot includes approximately 10,000 residential and business properties at flood risk from mainly surface water risk. Flood risk is also posed from the River Mole, from culverted watercourses, and from sewer flooding. The risk of flooding comes after a heavy rainfall event when constrictions within this drainage system cause water to back up, overtop a channel or pond in an area.

Crawley is situated in the upper part of the Mole Catchment that drains north into the Thames. Historically the River Mole and its tributary the Gatwick Stream have come out of bank and flooded, and there are a number of recorded incidents that have damaged property. Two other tributaries exist, the Isfield Brook and Crawters Brook. The Borough contains two water reservoirs the Tilgate and Titmus Lakes. Most of the flood defences in Crawley are earth embankments, and there is a diversion channel on the Gatwick Stream. While Crawley is a new town the drainage network has experienced problems with its culverted watercourses that can block or reach capacity.

CONSULTATION VERSION

## Chapter 2

### West Sussex Local Flood Risk Management Strategy

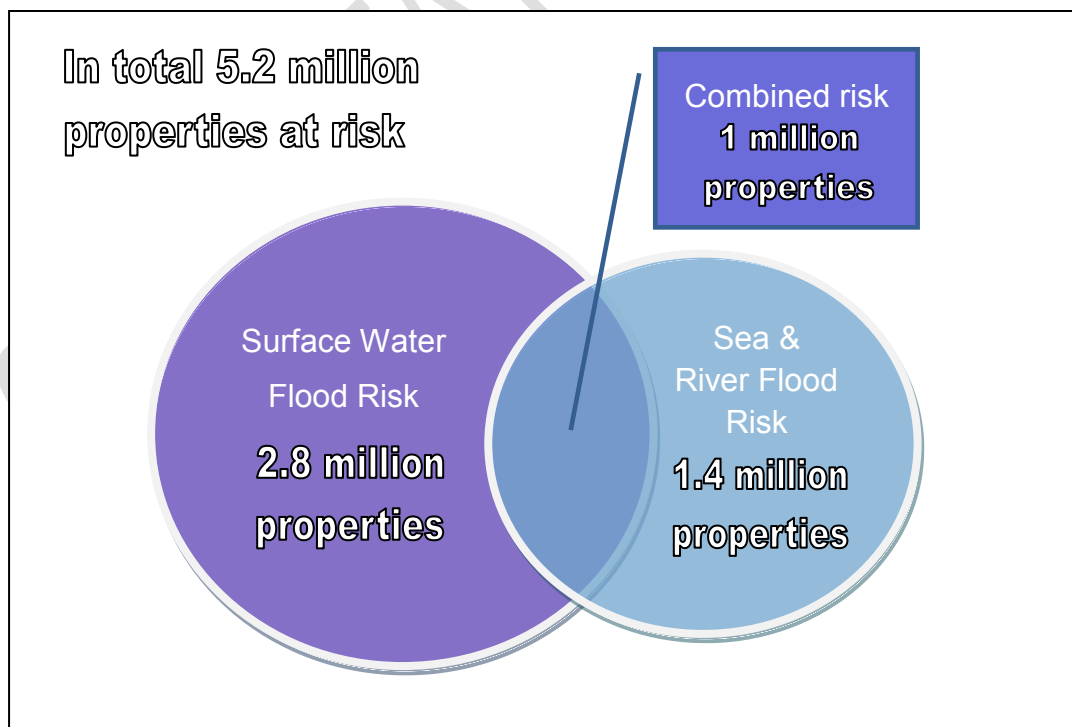
*“I have seen what can be achieved when communities and local partners work together to solve the problems they face. I have seen apparently insurmountable problems overcome by partners working together with a common purpose, pooling their energy and resources... as a society we can rise to the challenge of our changing climate and tackle the risks we face.”*

Richard Benyon MP, Parliamentary Under-Secretary of State

#### Background

In England, 5.2 million properties are at risk of flooding. Of these, 1.4 million are at risk from rivers or the sea alone, 2.8 million are at risk from surface water alone and 1 million are at risk from both sources. The Flood and Water Management Act 2010 requires upper and unitary councils to be Lead Local Flood Authorities and manage surface water, groundwater and ordinary watercourses.

**Figure 7: Properties at risk nationally by flooding source (source: Environment Agency)**



Lead Local Flood Authorities effectively join the Environment Agency in a partnership to manage flood risk across all sources. Any combination of sources of flooding could exist in an area so partnership working and joint projects are expected. The Flood and Water Management Act is an important part of how the Government reacted to the 2007 floods and subsequent Pitt Report (2008). Pitt's recommendations called for urgent and fundamental changes to the way the country was adapting to increased flooding.

The local strategy is at the forefront of this change, and puts new ways of working into practice. The local strategies across England will effectively manage risk by enabling people, communities, business and the public sector to work together. They will enable Lead Local Flood Authorities and other risk management authorities to plan for the future.

## National Context

Flood and coastal erosion management will require difficult decisions to be taken on where risk management activities are carried out both at national and local levels. This prioritisation process and the decisions taken are to be guided by six principles published in the National Strategy for England.

1

### • Community focus and partnership working

The flood risk management authorities (West Sussex County Council, District and Borough Councils, the Environment Agency, Internal Drainage Boards, the Highways Agency and Southern Water) will work in partnership with communities to understand the community perspective of flooding, help communities understand and actively prepare for the risks and encourage them to have direct involvement in decision making and risk management actions. Partnership working is also required to ensure that risk is managed in a coordinated way beyond authority boundaries, for example across catchments, with adjacent lead local flood authorities working together.

2

### • A catchment and coastal cell approach

In understanding and managing flood and coastal risks locally, it is essential to consider the impacts on other parts of the catchment. Authorities must seek to avoid passing risk on to others within the catchment without prior agreement. These agreements could potentially include the provision of funding by upstream communities for actions and measures carried out by others to manage the downstream risks. This principle asks all risk management authorities to consider the catchment or coastal cell as a whole to ensure the best outcome for the related parts.

3

- Sustainability

Flood risk management authorities should support communities by managing risks in ways that take account of all impacts and the whole-life costs of investment in risk management. The risk management solutions should be forward-looking, taking account of potential risks that may arise in the future and be adaptable to climate change. They should also work with natural processes where possible and enhance the environment.

4

- Proportionate, risk-based approaches

It is not technically, economically or environmentally feasible to prevent flooding altogether. A risk-based management approach targets resources to those areas where they have greatest effect. Risk management measures consider both the probability over time of a flood happening and the consequences that might arise if it did, for example by assessing the damages that arise from floods.

5

- Multiple benefits

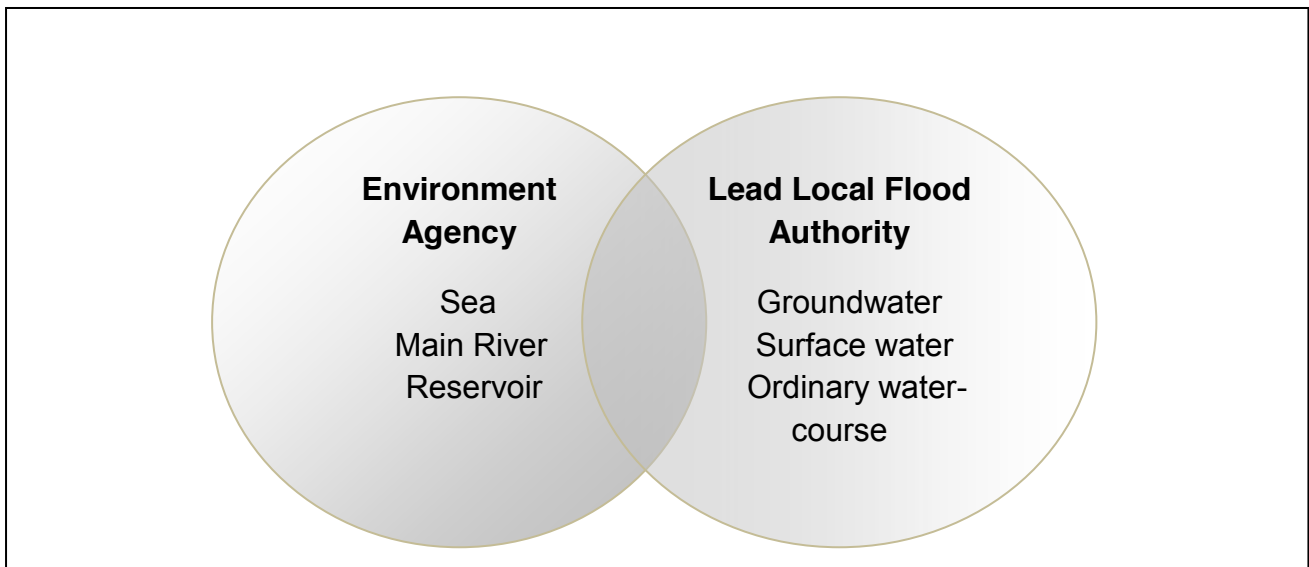
As well as reducing the risks to people and property, which is the primary concern, flood risk management can bring significant economic, environmental and social benefits. It can enhance and protect the built, cultural heritage, biodiversity, rural and natural environments by preventing loss and damage to habitats and heritage assets and reducing pollution, for example, through the use of Sustainable Drainage Systems. It can contribute to regeneration and income generation, protect infrastructure and transport links and contribute to economic growth.

6

- Beneficiaries should be encouraged to invest in risk management

The benefits achieved when flood risks are managed are in many cases localised and lead to personal or private gain through the protection of specific individuals, communities and businesses. They can also be public, through the reduction of future costs to society arising from incident recovery. The Government is keen to ensure that wherever possible alternative sources of funding can be secured in each area to reflect the local benefits that would be

delivered. Any funding found locally can supplement the amounts available nationally and mean as many communities as possible can be protected.



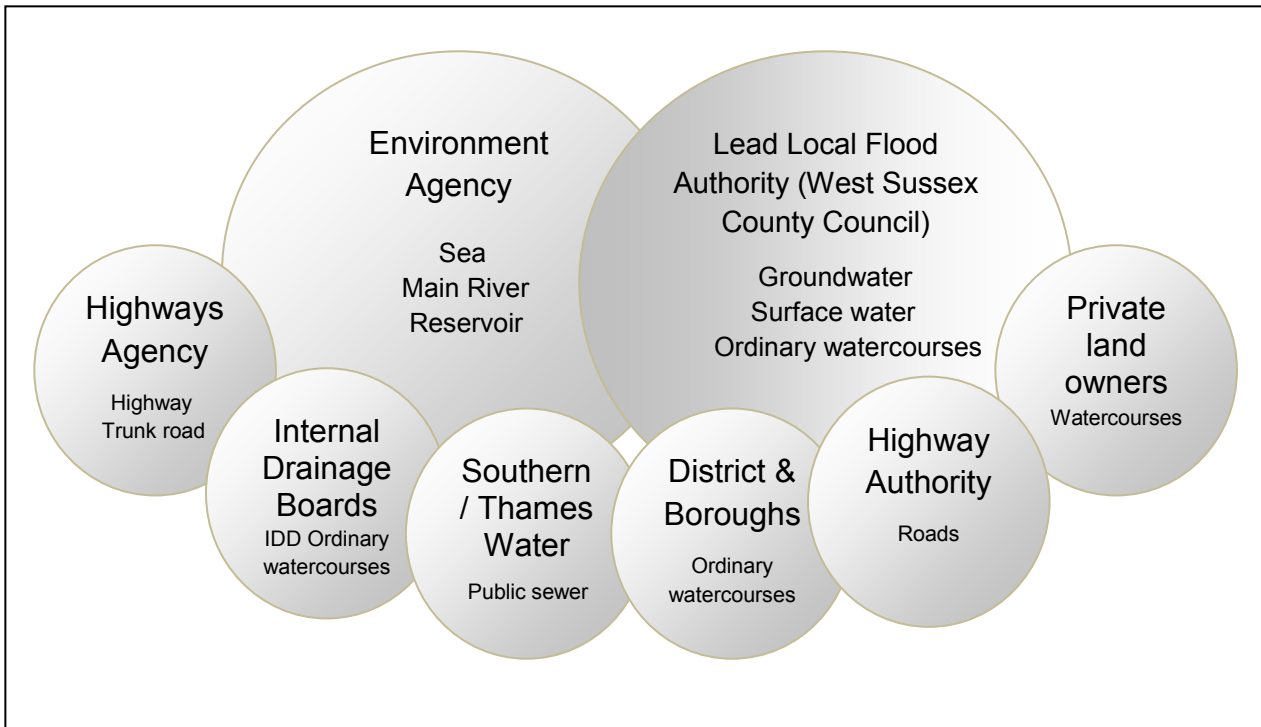
**Figure 8: Who manages what?**

### **Local Context**

Under the Flood and Water Management Act 2010 West Sussex County Council has the responsibility for developing, maintaining and applying a local flood risk strategy within the county. It is intended that local authorities should reflect the content, guiding principles, aims and objectives of the national strategy in the development of their local flood risk management strategies.

West Sussex County Council will not be working in isolation. A range of partner authorities known as risk management authorities also have flood and coastal erosion management duties, powers and responsibility. The development of the strategy will require input from the designated 'flood management authorities' who have a duty to act consistently with the local flood risk strategy. In West Sussex the other flood risk management authorities are the Environment Agency, the four Internal Drainage Boards (Upper Medway, Arun, Adur and South West Sussex), the Highways Agency, Southern Water Services Ltd, Thames Water Utilities Ltd and the District and Borough Council's.

In West Sussex, Southern Water Services Ltd and Thames Water Utilities Ltd are responsible managing public sewers, and responsible for resolving flooding issues where there is no significant interaction with other types of flooding. The seven District and Borough Councils in the county are an important part of flood risk management as they take an active role in assisting the Lead Local Flood Authority in performing some Flood and Water Management Act duties.



**Figure 9: Who manages what within West Sussex?**

The Internal Drainage Boards (IDBs) carry out maintenance works within the Internal Drainage District (IDD) to a programme. Three of the four IDBs are operated by the Environment Agency (the Arun, Adur and South West Sussex). The fourth IDB (Upper Medway) covers a small area within the county near East Grinstead. At the time of writing in 2013 an Environment Agency review into the management of Internal Drainage Districts was underway which may change the current set up.

This strategy will clarify roles and responsibilities for local flood risk, and the duties and permissive powers that flood risk management authorities have. It will also build on the existing partnerships developed in West Sussex. The strategy will also provide a framework for local communities to develop local partnerships and solutions.

Under the provisions of the Flood and Water Management Act the following duties are common to all risk management authorities:

- Duty to cooperate with other risk management authorities
- Duty to act consistently with the national and local strategies
- Powers to take on flood risk functions from another risk management authority
- Duty to contribute towards the achievement of sustainable development

- Duty to be subject to scrutiny from the lead local flood authority's democratic process.

## **Flood risk management responsibilities**

### **West Sussex County Council**

The responsibilities of the county council as lead local flood authority and as a risk management authority are to:

- Provide leadership of local flood risk management authorities;
- Develop, maintain, apply and monitor a strategy for local flood risk;
- Power to do works to manage flood risk from surface water runoff or groundwater;
- Power to request information from any person in connection with the authorities flood risk management functions;
- Power to exercise the Land Drainage Act 1991;
- Perform as a Category 1 responder to flood incident under the Civil Contingencies Act, including dealing with recovery and resulting homelessness;
- A duty to investigate and publish reports on flood incidents in West Sussex (where appropriate and necessary) to identify which authorities have relevant flood risk management functions, and what they have done or intend to do;
- A duty to maintain a register of structures or features that have a significant effect on flood risk;
- Power to designate structures and features that effect flood risk;
- Responsibility for the sustainable drainage systems approving body with responsibility for approval, adoption, inspection and maintenance of new sustainable drainage systems;
- Decision making responsibility for whether third party works on ordinary watercourses by third parties, that may affect water flow, can take place;
- A duty to contribute towards the achievement of sustainable development in the exercise of flood risk management functions and to have regard to any ministerial guidance on this topic.

### **West Sussex Highways Authority**

As the highway authority, West Sussex County Council advise on the road and transport issues associated with proposed development. We make sure that any impact on the road network is taken into account. We consider access to local facilities, such as shops and

schools, and the possible effects of a development on road safety and congestion. We then decide whether improvements to the transport network are needed.

## **Environment Agency**

The Environment Agency has the following roles and responsibilities as a risk management authority:

- A strategic overview of all types of flooding;
- Responsible for flood risk management on main rivers and the coast;
- Responsible for Environment Agency reservoirs, and, to regulate and enforce the Reservoirs Act 1975 on other reservoirs with capacity over 10000m<sup>3</sup>;
- Duty to be subject to scrutiny from Lead Local Flood Authorities;
- Carrying out flood risk management functions in a consistent manner with the national and local strategies, reporting to ministers on flood risk management and implementation of strategies;
- Powers to request information for any person in relation to flood risk management concerning Environment Agency functions;
- Power to designate structure and features with flood risk significance;
- To be a statutory consultee to the Sustainable Drainage Systems Approving Body;
- To be a statutory consultee to local planning authorities on flood risk matters;
- Perform as a Category 1 responder to flood incident under the Civil Contingencies Act;
- Consent and enforce applications for works on main river;
- A duty to contribute to sustainable development through flood risk management functions.

## **Internal Drainage Boards**

Internal Drainage Boards have the following roles and responsibilities as a risk management authority :

- Carry out maintenance work to a schedule to maintain drainage;
- Use statutory powers to ensure those responsible maintain the flow of water in a watercourse and to modify or remove inappropriate structures within channels. Take the appropriate action against those who inappropriately modify the watercourse;

- Responsible for reservoirs over 10000m<sup>3</sup> within their boundary;
- Power to exercise the Land Drainage Act 1991;
- A duty to contribute towards sustainable development;
- Powers to undertake flood risk management works;
- Undertake consenting on ordinary watercourse within their boundary;
- Be a statutory consultee on the Sustainable Drainage Systems Approving Body;
- Work alongside and together with neighbouring Internal Drainage Districts;
- Duty to be scrutinised from Lead Local Flood Authority democratic processes;
- Duty to act consistently with the Local and National Strategy;
- Power to designate structures and features that affect flooding.

### **Southern Water and Thames Water**

Southern Water and Thames Water have the following roles and responsibilities as a risk management authority:

- Duty to adopt new build sewers;
- Manage public sewer flooding;
- Duty to subject to scrutiny from Lead Local Flood Authority democratic process;
- Duty to have regard for the National and Local Strategies;
- Perform as a Category 2 responder to flood incidents under the Civil Contingencies Act.

### **Second Tier Authorities**

The Districts and Boroughs have the following roles and responsibilities as a risk management authority:

- Power to designate structures and features that affect flooding;
- Duty to act consistently with the Local and National Strategy;
- Duty to subject to scrutiny from Lead Local Flood Authority democratic process;
- Power to exercise the Land Drainage Act 1991;

- Powers to maintain watercourses that are not the responsibility of the riparian owners, as prescribed by the Enclosures Act;
- Perform as a Category 1 responder to flood incidents under the Civil Contingencies Act, including dealing with recovery and resulting homelessness;
- Perform as the local planning authority and a duty to encourage the appropriate development and promote sustainable development;
- Use statutory powers to ensure those responsible maintain the flow of water in a watercourse and to modify or remove inappropriate structures within channels. Take the appropriate action against those who inappropriately modify the watercourse.

### **Highway Authority**

The Highway Authority has the following roles and responsibilities as a risk management authority:

- Duty to have regard for the National and Local Strategies;
- Responsibility to maintain the highway under the Highways Act;
- Duty to regularly inspect and maintain highways structures;
- Powers to deliver works to protect the highway from flooding;
- Carry out maintenance and improvement works to maintain existing standards of protection for highways;
- A duty to contribute towards sustainable development.

### **Stakeholders**

While not designated flood risk authorities, stakeholders such as infrastructure providers, riparian owners, parishes and residents have a key part to play in flood risk management.

### **Utility and infrastructure providers**

While not risk management authorities, utility companies play an important role in flood risk management. Many assets of utility companies are in areas prone to flood and investment in flood protection is planned and carried out to a programme. Ensuring that the service the company provides is resilient to flooding can save the company money in the long term, so flooding is an important factor in investment and planning. Companies can achieve savings if they contribute to partnership schemes. This approach will provide mutual benefit for those involved.

## Riparian Owners

Home owners or business who live close to a river or ditch are likely to be riparian owners with maintenance responsibilities. If the watercourse borders the property it is common for the boundary of responsibility to extend to half way across the channel. Maintenance responsibilities include keeping the channel clear of blockages, and maintaining flow from obstruction. More details can be found on the West Sussex County Council and Environment Agency website by searching for riparian ownership. This local strategy supports the education of landowners in terms of their riparian responsibilities and the importance of undertaking regular maintenance.

## Parish and Town Council

Town and Parish Councils can make a significant contribution before and during a flood event. Coordinated assistance can be critical in supporting local residents and in providing the shelter for neighbours who have experienced flooding.

## Property owners and residents

It is home owners and business owner's responsibility to protect their property from risks, including flood water protection. More details can be found on the Environment Agency website by searching for property level protection.



## Objectives

To reflect the Governments strategic objectives in the local context, West Sussex County Council propose, in partnership with the districts and boroughs, the following objectives to guide local focus and progress. These are to:

- 1 • Understand the areas that flood
- 2 • Manage the flood risk in West Sussex
- 3 • Enable people, communities, business and public bodies to work together more effectively
- 4 • Put communities at the heart of what we do and help West Sussex residents during flood events, and recover as quickly as possible after incidents

All work undertaken by all flood risk management authorities in West Sussex will need to make progress under one or more of these objectives. Each of the items of work in the work programme (Appendix D) are referenced against these four objectives.



## Responsibilities under the Flood and Water Management Act

### **Strategic leadership**

West Sussex County Council chair the strategic leadership group that was formed in response to the new flood responsibilities commenced by the Flood and Water Management Act 2010. The group is comprised of the risk management authorities within West Sussex County, and meets quarterly with elected members to ensure that joint management cooperates and is unified.

To provide a framework for the strategic leadership role West Sussex County Council are required to produce a local strategy to direct flood risk management and ways of working in accordance with legislation. The work programme identified by this strategy will schedule future projects that will investigate flooding solutions or reduce the risk of flooding to residents in West Sussex. The work programme will be monitored to enable the foresight necessary for forward planning, and ensure future projects are ready in time for the following year's programme.

### **Power to reduce surface and groundwater flooding**

West Sussex County Council has powers to carry out flood risk improvement works within the county. It has powers but not a legal obligation to manage flood risk from surface water, groundwater and ordinary watercourses. There is no right to flood or erosion protection, except in very limited circumstances. West Sussex County Council, similarly to the Environment Agency and the District and Borough Councils, have permissive powers to construct works to protect people and property where these are economically justified.

The term 'permissive powers' relates to certain powers of Permitted Development (i.e. development not requiring planning permission) set out in the General Permitted Development Order, 1995. A risk management authority may choose to intervene in the public interest, where they believe works would be beneficial and / or economically viable, but we have no legal duty to do so. This recognises that we have finite resources and must prioritise how we use them.

Provided the local flood risk management strategy document is published, the council can carry out flood and coastal risk management works. In a similar way the Environment Agency has powers but not a legal obligation to manage main rivers and the coast. West Sussex County Council powers end where Environment Agency powers begin.

## **Request of information**

This partnership of risk management authorities ensures that data and information is shared across organisations. The Flood and Water Management Act 2010 gives West Sussex County Council powers to request information related to its flooding responsibilities. It is expected that the risk management authorities within West Sussex County Council boundary share data on request.

## **Duty to investigate flooding**

From April 2011 onwards West Sussex County Council has had a duty to undertake flood investigations after an incident occurs. The investigation must set out which risk management authority should lead the review, establish the reasons for the flood, and whether the response was appropriate. If flooding has occurred to more than ten properties in one incident, then a full investigation will be triggered. Depending on the circumstances of smaller flooding events, an initial investigation may still be required for flooding of less than ten properties.

West Sussex County Council has already commenced an investigation into the flooding that occurred in June 2012. The Council formed a multi agency group comprising the Environment Agency, Southern Water, Arun District Council, Chichester District Council, and Worthing Borough Council to investigate the flooding. The process highlighted various weaknesses in the drainage management and drainage infrastructure itself, some of which are in the process of being resolved, others will require further detailed work. This investigation has been published on the West Sussex County Council website.

## **West Sussex flood asset register**

The duty to produce and maintain a flood asset register commenced in April 2011. Assets are defined as structures that in the opinion of the lead local flood authority are likely to have a significant effect on flood risk. West Sussex County Council have used Defra guidance and local expertise in District and Borough Councils to collate this data.

The information will be added to the Environment Agency's online Asset Information Management System (AIMS) program from 2016 to which West Sussex County Council will have access. AIMS will map these drainage assets (over and underground), and include a record of their ownership and condition.

## **Power to designate structures**

West Sussex County Council as Lead Local Flood Authority, the districts and boroughs, and the Environment Agency now have powers to designate artificial or natural features that are important for flood or erosion risk management. Designation means that a feature may not be altered, replaced or removed without consent. Designated features will be added to the asset register that is maintained by West Sussex County Council.

## **Sustainable drainage systems approving body (SAB)**

Increasing urbanisation has caused problems with increased flash flooding after sudden rain. As areas of vegetation are replaced by impermeable concrete, tarmac or roofed areas the area loses its ability to absorb rainwater. This rain is instead directed into surface water and highway drainage systems, often overloading them and causing floods. The idea behind sustainable drainage systems (SuDS) is to try to replicate natural systems that use cost effective solutions with low environmental impact to drain away dirty and surface water run-off through collection, storage, and cleaning before allowing it to be released slowly back into the environment, such as into watercourses or the ground.

At the time of writing (2013) the commencement date for an approving body to oversee installation of SuDS has not yet been confirmed by Defra. The intention is to oversee the design and installation of SuDS into all housing developments so that surface water flooding is managed by design. The introduction of this body will help move the industry closer toward the goal of water-sensitive urban design (WSUD). WSUD is a land planning and engineering design approach which integrates the urban water cycle, including stormwater, groundwater and wastewater management and water supply, into urban design to minimise environmental degradation and improve aesthetic and recreational appeal.

West Sussex County Council as part of the South East Seven Group is developing the new role, including a master plan as to how the SuDS Approving Bodies may operate. I summary:

- The process will need to work together with the planning permission process;
- A developer will require SuDS consent before building;
- The approval, adoption and future maintenance of the SuDS will be undertaken by West Sussex as Lead Local Flood Authority;
- The district and boroughs will continue to perform as the local planning authorities;

## **Ordinary watercourse consents**

Consenting of works by third parties on ordinary watercourses under Section 23 of the Land Drainage Act 1991 were transferred from the Environment Agency to the Lead Local Flood Authorities. The consenting role for West Sussex County Council commenced in April 2012. Consent is refused if the works (a dam, weir, culvert, mill, other obstruction) would result in an increase in flood risk or affect nature conservation. An application can be made using a form that is available on the West Sussex County Council website.

The consenting role is being undertaken by the seven District and Borough Councils in West Sussex, following delegation from West Sussex County Council. The district and boroughs or West Sussex County Council can undertake works on ordinary watercourses.

## Enforcement

The planning process is supported by enforcement that ensures development is built in accordance to approved plans. The county council and second tier authorities are each responsible for the enforcement of their responsibilities. At county level this includes ordinary watercourse enforcement, and at the second tier this includes planning enforcement. The new sustainable drainage approval will also require enforcement in cases where there is a failure to build a developments drainage design in accordance with approve plans. In these cases officers will need to find a solution or enforcement action would be required to put right any unauthorised works.

## Sustainable development

Defras guidance on sustainable development in relation to flood and coastal erosion risk management functions defines some of the ways in which West Sussex County Council will contribute. The key topics supported in this Local Strategy are:

- Tackling climate change and to use techniques that enhance the natural environment
- Promote fairness in improving the wellbeing of communities
- Use green economic and operations decisions
- Use sound science to develop solutions
- To be transparent and be accountable to the public



## Responsibilities outside of the Flood and Water Management Act 2012

## Actions as a result of the June 2012 flooding in West Sussex

The local flood risk strategy supports all findings and recommendations from the West Sussex County Council Flood Report. The flood report recommends actions for each risk management authority and further investigations where more information is needed. Actions from the flood report form part of the works programme of this strategy. The work programme will be implemented by West Sussex County on a priority basis when funding is available.

## Requirements under the EU Flood Directive: Flood Risk Regulations 2009

The Flood and Water Management Act must be considered alongside the EU Flood Directive that was transposed into UK law as the Flood Risk Regulations on the 10<sup>th</sup> of December 2009. The Flood Risk Regulations require three types of assessment to be carried out in England; the Preliminary Flood Risk Assessment, Flood Hazard and Flood Risk Maps, and, Flood Risk Management Plans. The West Sussex County Council wet spot

analysis and works programme in this strategy will form the basis of the Flood Risk Management Plan.

## **Planning control**

The District and Borough Councils are the responsible authorities for managing planning control and making decisions on what will or will not be granted planning permission. West Sussex County Council is responsible for planning control of libraries, waste sites, mineral sites and schools. Current planning laws direct development away from flood risk areas, however there remains an emphasis on development and the economy. This challenge of permitting safe housing is a constant challenge for developers and planners.

With regard to development in flood risk areas, site allocations and planning applications are informed and assessed by the planning process in a number of ways. The planning process, in accordance with the National Planning Policy Framework (NPPF), applies a principle called the Sequential Test that seeks to direct development towards areas with the lowest risk of flooding. Where this is not possible, the Exception Test is undertaken whereby it must be demonstrated that any development in an area at risk of flooding will provide wider sustainability benefits to the community that outweigh flood risk, and that such development will be safe for its lifetime. Flood risk should not be increased elsewhere as a result of development.

The NPPF classifies flood risk into four different zones of probability (flood zone 1 (low probability), flood zone 2 (medium probability), flood zone 3a (high probability) and flood zone 3b (functional floodplain)). These zones are set out in Strategic Flood Risk Assessments which are used to inform decisions regarding development and flood risk.

## **Response, rescue and recovery**

West Sussex Multi-Agency Flood Plan contains the Sussex Resilience Forum procedures for response, rescue and recovery. The plan sets out when a response is triggered and when adverse weather arrangements begin. This plan was activated and used during the June 2012 flooding. These plans are in place across the country to ensure good management and coordination in an emergency situation. All emergency response organisations including the police, fire and rescue, ambulance services, West Sussex County Council, the districts and boroughs and the Environment Agency are signed up to the plan and have a role to play before and during an event.

The plan is in two sections, a generic overview and a more detailed plan for each urban centre within the county. The plan considers all types of flooding; coastal, river, surface, ground, sewer flooding. The triggers for multi-agency response are Environment Agency Flood Alerts and Warnings, Met Office Weather Warnings, and reports of flooding. Considerations involve pre agreed communication between risk management authorities to identify the level of risk and decide on the action. Depending on the size of the event this could be to do nothing, activate Part 1 of the Multi-Agency Flood Plan, or activate both parts.

If a response is activated, adverse weather arrangements are supported by the Sussex Emergency Response and Recovery Document and Multi-Agency Strategic Co-ordinating Group Guidance. The multi agency response will either be an Adverse Weather Teleconference (chaired by the Environment Agency), a Adverse Weather Office (chaired by the Police), or, to set up Strategic Co-ordinating Group (chaired by the Police).

With regard to rescue procedures the detailed plans for each urban centre contain the processes involved to evacuate, and also include shelter arrangements. Procedures and the response to flooding can vary depending on the type of flood event, the area and the time of year. Membership of the recovery group will vary depending on the event, but will usually include all risk management authorities. A Recovery Co-ordinating Group lead by West Sussex County Council will manage the recovery process.

### **The Water Framework Directive**

The Water Framework Directive seeks to improve the management, protection and enhancement of the water environment. In 2009 the Environment Agency produced eleven River Basin Management Plans for the basin districts across England and Wales. These plans are available online at the Environment Agency website. The work programme in this strategy is eligible to receive contributions from the Water Framework Directive to impellent improvement projects.

The West Sussex local strategy supports the actions identified in the South East River Basin Management Plan. All projects on the work programme are required to have regard to the ecological and chemical status of water bodies. The council will help deliver the objectives of these plans where possible. West Sussex County Council will conduct ordinary watercourse consenting and future sustainable drainage management so that the functions contribute to the Water Framework Directive objectives.

There are 148 water bodies within West Sussex boundary. These water bodies consist of 121 river catchments, 14 groundwater bodies, 8 lake water bodies, and 5 coastal water bodies. Investigations into the quality of these water bodies have identified work that needs to be done to improve their status and the water environment as a whole. This process of investigation and identification is supported by West Sussex by the inclusion of WFD projects on the work programme.

The watercourses within the county are extensively used for water abstraction, agriculture, navigation and flood protection. Locks, weirs, dams and other structures are a significant problem for plants and animals and so where redundant structures exist that are no longer required West Sussex will support future works on the work programme to make improvements. Cost may restrict what work can be undertaken.

Pollution from agricultural land, treated waste water discharges and urban drainage are the major pressures to chemical and ecological status of water quality in West Sussex. To manage these pressures the strategy:

- supports catchment sensitive farming initiatives that seek to change agricultural practices;
- encourage planned waste water projects so that water companies can contribute to reducing the concentration of pollutants;
- Adopt water sensitive urban drainage through the planning process and prioritise on key areas.

A collaboration of interested parties including, Sussex Wildlife Trust, Arun and Rother Rivers Trust, Adur and Ouse Rivers Trust, Natural England, Environment Agency, Water Companies and many others, have founded two catchment groups, the Adur and Ouse Partnership and the Arun and Western Streams steering group, which cover West Sussex County. These groups are sharing the collective knowledge of the area and integrating their activities on the ground to deliver more for the environment. West Sussex County Council will continue to engage with the Adur and Ouse Partnership and the Arun and Western Streams steering group to further our understanding of the local water environment and help prioritise and implement work.

### **Partnership working and South East Seven**

Partnership working between authorities is essential to the effective delivery of flood risk management actions. Partnerships need to link authorities at director and officer level so each organisation has the best chance of working effectively. While the Flood and Water Management Act 2010 has streamlined flood risk responsibilities duties are distributed across different organisations.

Partnership working is therefore extremely important to flood risk management because if people are regularly communicating delivery and progress is more likely to be effective. By working together we can avoid duplication, maximise available resources and funding opportunities, and share best practice, skills and expertise.

A number of partnerships at a local, national and regional level provide a forum for discussion on key issues and the delivery of projects. The key partnerships in the West Sussex are listed below.

- **South East Seven**

A partnership of seven upper tier authorities (East Sussex, West Sussex, Kent, Medway, Hampshire and Surrey) created with the purpose of identifying savings through working together, using shared services, increasing efficiencies and generally working better.

- **West Sussex Flood Risk Management Board**

The board is a strategic level partnership of the flood risk management authorities in West Sussex which meet on a quarterly basis to provide a strategic overview of flood risk management work within the county.

- West Sussex Management Group

The Group are an officer level working team that meet quarterly to progress actions.

- Flood Action Groups
- Water Framework Directive: Adur and Ouse Partnership
- Water Framework Directive: Arun and Western Streams Partnership

CONSULTATION VERSION

## Chapter 3

### Funding and the local programme

West Sussex County Council along with all other county and unitary authorities are funded by a Formula Grant provided by the Department for Communities and Local Government (CLG). Together with locally collected council tax, the two resources fund the entire range of services administered by the council. Flood risk management is one of these services alongside health and social care commissioning, communities commissioning, strategic development, public health, finance and assurance, service operations, adult services and child services. West Sussex County Council have to decide how much to allocate to each service, and consider flood risk management priorities against other investment needs.

This section describes how flood risk management investment in West Sussex is funded. Budgets are limited so it is important to identify exactly what can be done, what will require additional contributions, and what can be programmed to happen at a later date. There are various funding streams available to fund projects, some of which are new.

The Pitt Review 2007 recommended that a new funding scheme should be implemented to allow community and third party groups to invest in flood risk management. The new funding mechanism is now active and grants money based on what benefits will be delivered by the project (a payment based on outcomes). This payment is made from the main pot of annual funding which is called 'Flood Defence Grant in Aid'. The key benefits considered in the payment are the reduced risk to householder property, infrastructure, to vulnerable communities, environmental benefits, and benefit to businesses and agriculture.

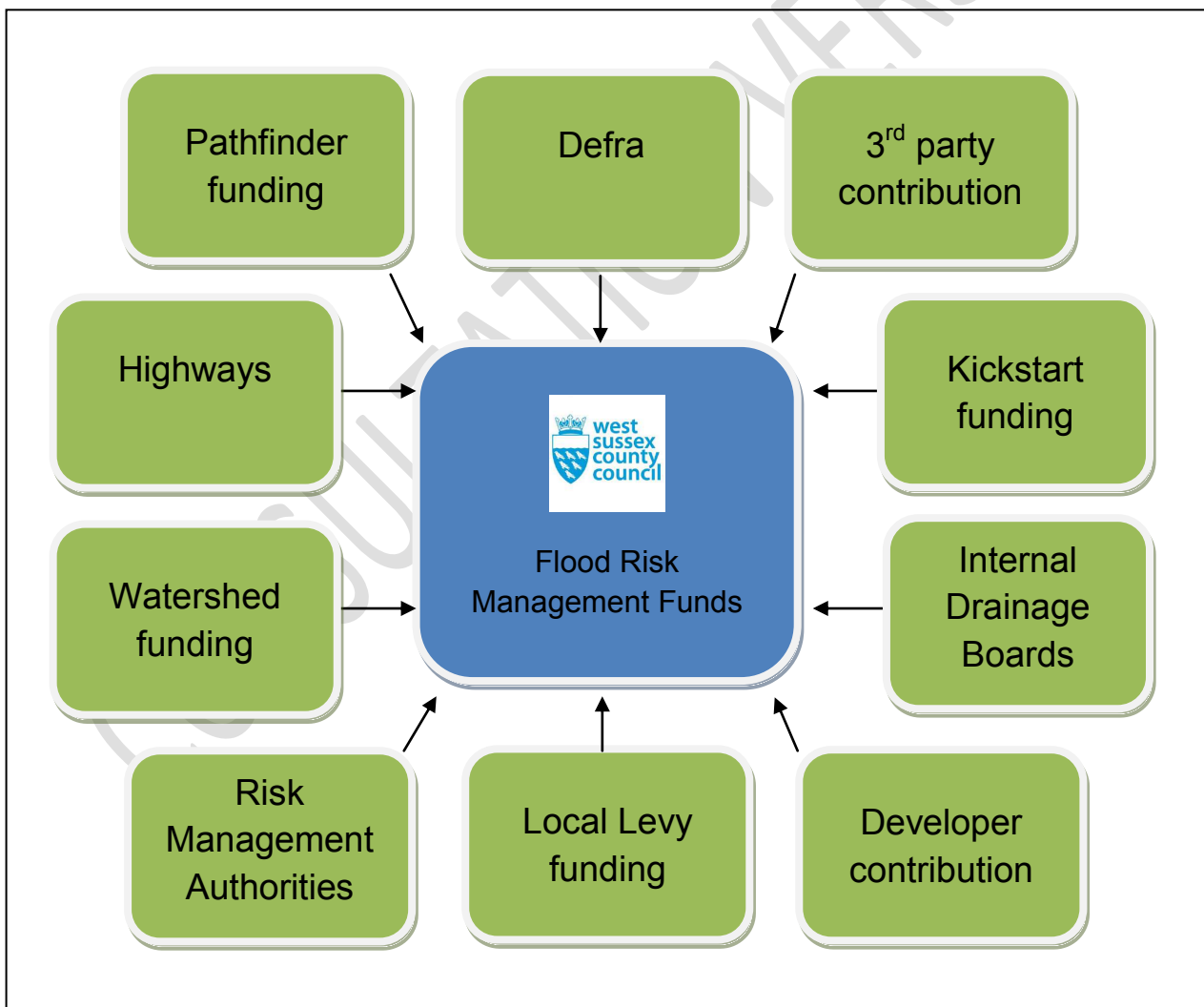
The funding process aims to encourage those that will benefit from the flood improvement works to contribute financially. This mechanism was put in place to draw in funds and bolster the Flood Defence Grant in Aid pot of money. Defra has set new principles for the new national funding systems. These include:

- Increase the total amount of available resources for flood risk management;
- Enable more cost effective options to be chosen;
- Enable more projects to be funded;
- Funds will be prioritised and available to those most at risk and who need it most;
- All risk management authorities will have equal access to bid for money for projects;
- The general tax payer should not pay towards protecting new developments, now or in the future;

- Greater local decision making should not compromise the future programme of projects waiting for funding;
- Catchment Flood Management Plan policies and findings should be adhered to when bidding for projects and investing in flood risk management;
- Maintain the wide spread take up of flood risk insurance by maintaining flood risk effectively.

Using this funding process, some project will fully funded, some will achieve partial funding. The balance is decided on the amount of benefit that the project would deliver. If partial funding is achieved, the shortfall in the total project cost is expected to be met by a contribution or by revising the proposal.

Funding can be applied for by any risk management authority and can be made via the Lead Local Flood Authority.



**Figure 10: The funding avenues available to West Sussex County Council**

It is the intention of West Sussex County Council to undertake or support other risk management authorities in undertaking these actions to a schedule. The schedule is agreed each year by the Environment Agency and is signed off by the elected members who form the Southern Regional Flood and Coastal Committee.

The work programme (Appendix D) is compiled of actions from existing plans, strategies and from the current list of work that is scheduled for 2013/14. The programme will be compiled of projects from these sources:

- Existing works scheduled agreed from previous years (works already on the Medium term Plan)
- Shoreline Management Plan
- Catchment Flood Management Plan
- Surface Water Management Plans
- West Sussex County Council Report on June 2012 Flood Event
- Flood Resilience Community Pathfinder Scheme
- Flood Risk Regulations 2009
- Flood and Water Management Act 2010
- The Water Framework Directive
- The Highways Authority (West Sussex Country Council)
- Southern Water infrastructure work

These actions will help work towards achieving the Local Flood Risk Management Strategy's objectives. The managing and supporting partners who will deliver each action are detailed as well as the timescales over which the actions will be achieved. The Delivery Plan will be reviewed on an annual basis.

A number of fluvial and coastal schemes are currently being progressed across the county by the Environment Agency, district and boroughs. The schemes include strategy development, flood alleviation works, and ongoing management of key assets including beach management, outfall and tidal walls. They have all achieved funding through the partnership funding approach. Due to their priority some projects have secured 100% funding because of the significance level of protection they provide a community. In other cases a contribution has been required in order to unlock the funding.

### **What is being done in my area?**

To easily identify major flooding schemes being undertaken in your area visit [environment-agency.gov.uk/homeandleisure/](http://environment-agency.gov.uk/homeandleisure/) and utilise the postcode search function. The map shows flooding and coastal erosion schemes that have received funding this financial year and which may receive government funding in the next.

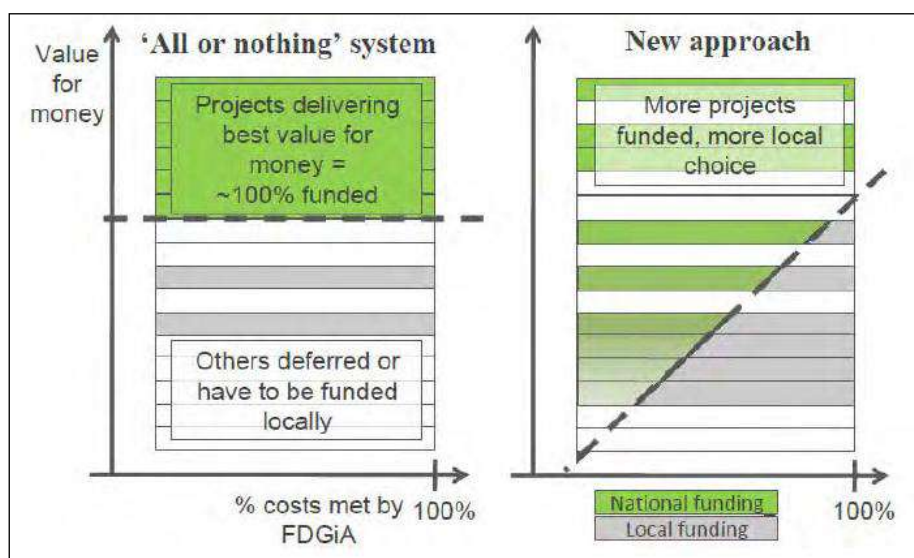
## How will projects make it onto the work programme?

Defra has changed the way in which risk management authorities can access funding for flood risk management activities. Under the new scheme funding can be gained based on the benefits delivered (payment for outcomes). Benefits are calculated by assessing indicators' such as the number of households protected, the damages being prevented, the impact on vulnerable communities, environmental benefits, and benefits to businesses and agriculture amongst others. The Government developed the methodology in line with the Pitt Review recommendations.

The funding scheme aims to encourage those that will benefit from the flood alleviation scheme, such as community businesses and developers, to contribute financially. It is anticipated that this process will enable Defra to spread its finite resources more widely to fund more projects. This aspiration is explained further in Defra's funding model that compares the old all or nothing funding regime to the new approach. Defra has devised a set of principles to support the new national funding system:

- Encourage an increase in total investment in flood risk management by operating authorities, beyond levels provided by central Government alone;
- Enable more local choice within the system and encourage innovative and cost-effective options to be promoted;
- Rather than some projects being fully funded and others not at all, now some funding will be available to all potential projects;
- Funds from central government should prioritise protecting those most at risk and least able to help themselves;
- All flood and coastal erosion projects, regardless of which risk management authority is leading it, should be treated equally based on the benefits delivered and damages avoided.
- The general taxpayer should not pay to protect new development in areas at risk of flooding, now or in the future;
- Greater local input and decision making should not come at the expense of creating a stable pipeline of projects;
- All investment should be made within a nationally consistent framework to take account of policies and findings within Catchment Flood Management Plans;
- Maintain the widespread take-up of flood insurance by helping to keep insurance affordable through risks being managed properly.

Under this system some schemes will continue to receive complete funding, if the benefits significantly outweigh the costs, and for others partial funding would be available, and partnership contributions would be sought. Figure 11 illustrates the old 'all or nothing' system, and, the new approach. Funding can be applied for, on an annual basis, via the Government's Flood Defence Grant in Aid. Applications are assessed by the Environment Agency at a Project Approval Board and applicants receive an indicative allocation of funding pending approval by the Regional Flood and Coastal Committees.



**Figure 11: Contributions and full funding**

Applications are open to the Environment Agency, county councils, district and borough councils, and Internal Drainage Boards. Funding from the Regional Flood and Coastal Committee's local levy is also available for flood alleviation schemes, to tackle tidal, coastal, fluvial and surface water flood risk.

A full list of the current flood and coastal risk management schemes approved by the Southern Regional Flood and Coastal Committee can be found online at [environment-agency.gov.uk/research/planning/](http://environment-agency.gov.uk/research/planning/).

### Next Steps

This strategy represents the first step towards a co-ordinated local flood risk approach. The strategy sets out how the County Council, in partnership with the other risk management authorities and key stakeholders, will manage local flooding issues across West Sussex over the next five years.

The key focus for the first five years is to build in-house capacity, as well as a robust evidence base to support effective decision making through the undertaking of local studies and assessments. A number of schemes to address local flooding problems on the ground will be developed and delivered.

The work programme (Appendix D) will be reviewed by the West Sussex County Council drainage strategy team at agreed checkpoints so that progress can be measured, and the programme can be updated with new information and new projects that emerge.

After the public consultation period has ended on the 9<sup>th</sup> September the finalised strategy will be published on the West Sussex Website in Autumn 2013.

## Chapter 4

### **Strategic Environmental Assessment (SEA)**

A Strategic Environmental Assessment (SEA) is being undertaken to ensure that significant environmental effects arising from this strategy are identified, assessed and mitigated.

Strategic Environmental Assessment is a generic tool that was introduced by the European Union Directive 2001/42/EC. The objective of the Strategic Environmental Assessment Directive is to “to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development”(Article 1)”. This requires national, regional and local authorities in Member States to carry out strategic environmental assessment on certain plans and strategies that they promote, such as this strategy.

Monitoring of the significant environmental effects of implementing the strategy will be undertaken to comply with Strategic Environmental Assessment Directive - Article 10.1, to ensure that any unforeseen adverse effects of the strategy are recognised and dealt with.

The Strategic Environmental Assessment is being carried out as the Strategy develops. The assessment represents Stage A of the process, the scoping report. The scoping report sets the context and objectives of the environmental report, and sets the baseline information from which future environmental performance can be monitored. Both the Strategy and the SEA are available for consultation until the 9th September 2013. After this date the comments received will be incorporated into the subsequent environmental analysis that will make the final environmental report.

## Appendix A

### The West Sussex Flood Risk Management Strategy Project Team

Organisation
Adur District Council
Worthing Borough Council
Arun District Council
Crawley Borough Council
Horsham District Council
Mid Sussex Council
Chichester District Council
West Sussex County Council
Southern Water
Environment Agency

## Appendix B

### The West Sussex Wet Spots

Appendix B is available as a separate document

Aldingbourne, Westergate & Eastergate
Aldwick Bay
Angmering
Arundel
Barnham & Walberton
Billingshurst
Birdham
Bognor Regis & Felpham
Bosham
Bramber & Upper Beeding
Burgess Hill
Charlton
Chichester
Chidham
Copthorne
Crawley
Earnley & Bracklesham
East Dean
East Grinstead
East Preston
East Wittering
Ferring Coast & Rife
Fishbourne
Hassocks
Haywards Heath & Lindfield
Horsham
Hunston
Littlehampton
Littlehampton West & Climping
Loxwood
Middleton-on-Sea & Elmer
Midhurst
North Mundham & Runcton
Oving
Pagham & Nyetimber

Pulborough
Rustington
Sayers Common
Selsey (West)
Selsey East
Shoreham & Lancing
Sidlesham
Singleton
Sompting
Southbourne, Hermitage & Nutbourne
Southwater
Storrington
Tangmere & Boxgrove
Thorney
West Itchenor
West Wittering
Westbourne
Worthing

CONSULTATION VERSION

## Appendix C

### Legislation relevant to the West Sussex Local Flood Risk Management Strategy.

Flood Risk Regulations 2009

The Flood and Water Management Act 2010

Catchment Flood Management Plans

Shoreline Management Plans

Strategic Flood Risk Assessments

The Climate Change Act 2008

Conservation of Habitats and Species Regulations (2010)

Civil Contingencies Act (2004)

Strategic Environmental Assessment (SFRA) (2001)

Land Drainage Act 1991

Making Space for Water

The Natural Environment and Communities Act 2006

The Reservoirs Act 1975

The Water Industry Act 1991

The Water Resources Act 1991

The Building Act 1984

The Health Act 2009

The Highways Act 1980

The Environment Act 1995

# Appendix D

## The Work Programme

Appendix D is available as a separate document called the West Sussex Work Programme

WET SPOT	DISTRICT	ACTION	OBJECTIVE	PROPERTY BENEFITTING FROM REDUCTION IN FLOOD RISK	LEAD	IMMEDIATE PRIORITY	SOURCE	COST	C/B	Joint funded?	WSDC OBJECTIVE	Completed ?
ALDINGBOURNE, VESTERGATE & BASTERGATE, BARNHAM & VALBERTON	CHICHESTER / ARUN	Remove obsolete structures, Structures or other mechanisms in place and managed to enable fish to access waters upstream and downstream, operational and structural changes to locks, sluice, weir, beach control etc.	To improve regulated flows, Appropriate management of impoundment, Modify structures	0	ENVIRONMENT AGENCY	5-10 YRS	WFD	£100k	-	No	1	<input type="checkbox"/>
ALDINGBOURNE, VESTERGATE & BASTERGATE, BARNHAM & VALBERTON, TANGMEFE & BOVINGE	CHICHESTER	A29/50 Skripney Flood	Provision of new ditches on private lane from Sack Lane southward.	50	WSDC	0-2 YRS	AMPFM	£110K	-	No	2	<input type="checkbox"/>
ALDVICK BAY	ARUN	Complete the drainage repair works in the area of Hook Lane and Hook Lane Close	Improvements to existing highway drainage in the area	12	WSDC	0-2 YRS	WSDC FLOOD REPORT	£45k	-	No	2	<input checked="" type="checkbox"/>
ALDVICK BAY	ARUN	Work together with Adur District Council to investigate further causes of the flooding in Elizabeth Close	Understand the flood risk at Elizabeth Close, Aldvick Bay	0	WSDC ADD	2-5 YRS	WSDC FLOOD REPORT	£5k	-	Yes	1	<input type="checkbox"/>
ANGMERING	ARUN	Fluvial and surface water flood alleviation scheme	Address flood risk in Angmering	317	ENVIRONMENT AGENCY	2-5 YRS	MTP	£750k	-	Yes	2	<input type="checkbox"/>
ARUNDEL	ARUN	Arundel flood defence improvements	Demolition and replacement of walls, localise raising of low spots	116	ENVIRONMENT AGENCY	2-5 YRS	MTP	£3.6K	-	No	2	<input type="checkbox"/>
ARUNDEL	ARUN	Arundel town defence improvements	Address flood risk in Arundel (note: significant contributions still required)	129	ENVIRONMENT AGENCY	5-10 YRS	MTP	£9.2 million	-	Yes	2	<input type="checkbox"/>
ARUNDEL, LITTLEHAMPTON	ARUN	Lower Tidal River Arun Strategy	Recommend options for flood risk management at the River Arun	0	ENVIRONMENT AGENCY	0-2 YRS	MTP	£78K	-	No	1	<input type="checkbox"/>

The work programme is listed alphabetically by wet spot. Some significant completed projects are included on the list. Dark blue lines show projects that have secured funding, and light blue lines show future projects.

The West Sussex County Council objectives 1-4 are referenced against each project.

This work programme will be monitored and updated by the West Sussex Drainage Strategy Team as appropriate over the lifetime of the strategy.

# Appendix E

## Funding

Central Government has committed funds to Lead Local Flood Authorities through the revenue support grant so that Flood and Water management related responsibilities can be implemented. At the time of writing Defra is providing £36 million a year to county and unitary councils to deliver their flood risk management functions. The amount of money provided to each unitary or county council depends on the level of risk in the area. West Sussex County Council were allocated £177k for 2011/12, £414k for 2012/13, and £414k for 2013/14. The Districts and Boroughs are responsible for managing some of the flood risk responsibilities that have been outlined and receive some of the allocated amount via West Sussex County Council.

From 2013 the £6 million provided by Defra, £15 million will continue to be distributed by Defra, and the remaining £21 million will transfer into the general funding of the county council or unitary authority. The grant and revenue sources describe can be boosted by small incomes generated from Ordinary Watercourse Consenting and in the future, applications for Sustainable Drainage.

Within the West Sussex total budget there are other funding streams that can be spent on flood risk. Kickstart is a £15 million allocation for community projects. £1.5 million has been allocated to fund community flood risk projects. Operation Watershed is the money allocated by Defra to West Sussex County Council to carry out some of the recommendations in the West Sussex Flood Report on the June 2012 flooding. This is an £8.25 million pot to fund improvement works in key areas that flooded. Another Defra initiative is the £5 million Pathfinder Project. West Sussex County have successfully bid for £298,000 of the Pathfinder funding for a flooding awareness and property level protection scheme.

West Sussex also contributes via the Local Levy to the Southern Regional Flood and Coastal Committees fund for flood alleviation schemes.

### Community Infrastructure Levy

The community infrastructure levy came into force in April 2010 and allows Lead Local Flood Authorities to raise funds for flood risk management from new development. The Planning Act 2008 covers the Infrastructure Levy that states the levy can contribute toward a variety of infrastructure including transport, schools, hospitals, parks and schools and food defences.

## **Town and Parish Councils**

The Localism Act enables Town and Parish Councils to spend money on flood risk management. This means that local members could contribute to a local scheme to unlock 'Flood Defence Grant in Aid' funding if partial funding has been achieved.

## **Internal Drainage Boards**

An Internal Drainage Board (IDB) is a local public authority that manages water levels. They are an integral part of managing flood risk and land drainage within areas of special drainage need in England and Wales. Internal Drainage Boards obtain income from rural land owners who pay agricultural drainage rates. The Internal Drainage Boards spend their income on maintaining the watercourses, capital asset renewal and refurbishment, pumping station running costs and precepts payable to the Environment Agency. At the time of writing an IDB review was assessing the operation of IDB with a view to restructuring how these authorities conduct their work. The review is likely to affect the responsibility as it stands.

Together the three IDB in West Sussex raise approximately £400k per year.

## **Southern Water**

Southern Water's income and expenditure on flood risk is regulated by Ofwat the Water Services Regulation Authority. Funding is not allocated by county but an amount is allocated to tackle sewer flooding and infrastructure improvements per 5 year period. From 2010 – 2015 £2 billion was allocated for improving assets, improving services and environmental improvements. Southern Water will be able to contribute to combined sewer flood risk projects and unlock 'Flood Defence Grant in Aid' funding.

## **Environment Agency**

The key streams of funding for flood risk management are managed in West Sussex by the Southern Regional Flood and Coastal Committee. These streams are the 'Flood Defence Grant in Aid' (from central Government), local levies (raises by the LLFA), precepts (collected from Internal Drainage Boards and landowner general drainage charges). Investment from this funding represents the backing for flood alleviation schemes for river, sea and local flooding.

## **Section 106 funding – developer contributions**

Section 106 of the Town and Country Planning Act 1990 facilitates the provision of funds to support services or infrastructure. The agreement is made at the planning application stage between the developer or land owner, and the local authority. The funds can be used for flood risk management should a proposal increase flood risk. Community Infrastructure Levy (CIL) was introduced in April 2010 as a mechanism for the developer contributions.

NOTES

CONSULTATION VERSION

NOTES

CONSULTATION VERSION

[www.westsussex.gov.uk/floodconsultation](http://www.westsussex.gov.uk/floodconsultation)

