

# Wiltshire Local Flood Risk Management Strategy



October 2014



# Wiltshire Local Flood Risk Management Strategy

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### **Acronyms used in this document**

- CIL – Community Infrastructure Levy
- EA – Environment Agency
- FDGIA – Flood Defence Grant Aid
- LFRMS – Local Flood Risk Management Strategy
- LLFA - Lead Local Flood Authority
- LRF – Local Resilience Forum
- SAB – Sustainable Drainage Approval Body
- SuD – Sustainable Drainage Systems

# Wiltshire Local Flood Risk Management Strategy

## Executive Summary

Flooding is a serious issue in Wiltshire, with extensive flooding in the north of the county taking place in 2007 and 2008, and more recently across the whole county in 2014, when over 500 properties were affected.

Wiltshire Council is the Lead Local Flood Authority for the county and has prepared a Local Flood Risk Management Strategy to describe its approach to flooding and how it will work with other organisations.

Flood risk within Wiltshire is often a complex interaction between river, surface, ground water and sewer flooding, and the local geology is a significant factor. The northern part of the county is predominately underlain by clay, with flooding generally caused by river or excessive surface water runoff. The south of the county is characterised by underlying chalk deposits, with potential risk of ground water flooding in many areas.

Wiltshire Council's Local Flood Risk Strategy seeks to

- Improve knowledge regarding flood risk
- Improve protection from flooding
- Improve resilience to flooding
- Improve the environment
- Improve communications about flooding issues

Wiltshire Council cannot deliver the objectives of the local strategy without the assistance of others. The Council works with other risk management authorities, especially the Environment Agency and water companies, local town and parish councils, community groups, other local authorities and the public.

The Council's Strategic Flood Risk Management Group is chaired by a Cabinet member portfolio holder, Councillor Seed, who works closely with the Chairs of the three Operational Flood Working Groups, currently chaired by Councillors Hewitt and Jacobs.

The Operational Flood Working Groups cover the north and south of the county, based broadly on river catchment areas, with a separate group for Salisbury, and usually meet every two months. The meetings are generally attended by representatives from the Environment Agency, Wessex Water, Thames Water, Highways Agency, Wiltshire Fire and Rescue, Canal and Waterways Trust and other organisations having an interest in flooding and drainage matters, including town and parish councils.

The Council has a significant budget for drainage improvement and flood alleviation of works, which is £1,000,000 in 2014/15, and bids for additional funding as opportunities arise to help in implementing its strategy.

**Vision**

Working together to manage local flood risk in Wiltshire

**Aims**

To work with stakeholders, local communities and organisations responsible for flood risk management

To enable a better understanding of flood risk

To reduce the risk of flooding where it is technically, environmentally and socially cost effective to do so

**Objectives**

Improve knowledge regarding flood risk

Improve protection from flooding

Improve resilience to flooding

Improve the environment

Improve communications about flooding issues

**Strategy Measures**

Studies  
Collecting data  
Working with others  
Analysing incidents  
Surveying assets  
Sharing knowledge

Structural and non-structural measures  
Assess full benefits of schemes  
Explore joint funding with others  
Develop Medium Term Plan  
Develop longer term proposals

Work with LRF  
Prepare Flood Plan  
Operational Flood Plans  
Work with others to develop Flood Wardens  
Encourage use of flood warning service

Maintain drainage assets  
Enhancement measures in schemes  
Planning Conditions  
Drainage consents  
Development SuDs  
SuDs Approval Body

Area Boards  
Operational Flood Working Groups  
Flood awareness events  
Press website and social media  
Encourage self help

## Introduction

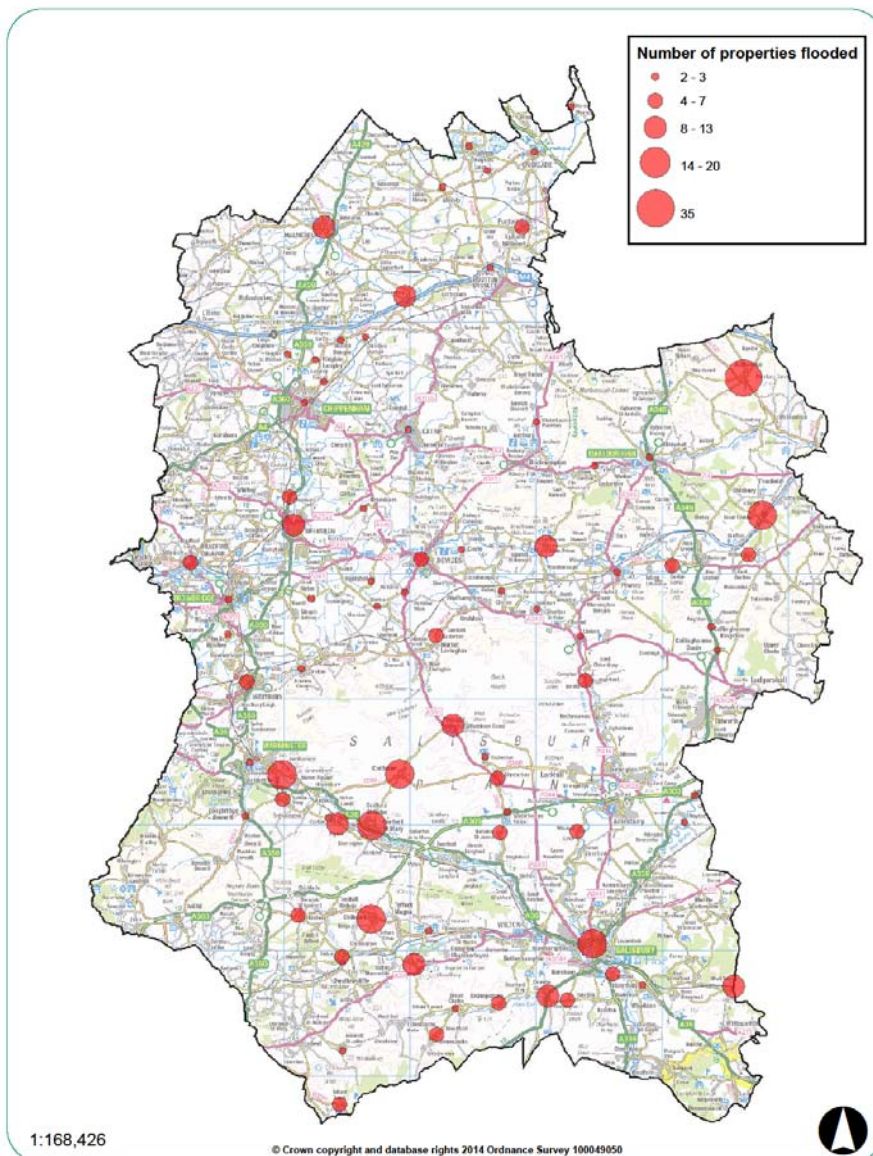
The Flood and Water Management Act 2010 requires Wiltshire Council to develop a Local Flood Risk Management Strategy (LFRMS). The Council is responsible for maintaining, applying and monitoring the strategy, and ensuring that it is consistent with the National Flood and Coastal Risk Management Strategy.

The risk of flooding is increasing due to pressures in urban environments, and with climate change more severe rainfall events are predicted. These will create additional challenges for communities and have implications for new developments.

Wiltshire experienced severe flooding between December 2013 and March 2014, with over 500 properties flooded and a number of roads having to be closed to traffic. Many communities in Wiltshire were also affected by the flooding in 2007 and in 2008. Many communities in Wiltshire have experienced at first hand the damage and disruption that flooding can cause.



Properties Flooded December 2013 - March 2014



*There was widespread flooding across Wiltshire between December 2013 and March 2014 with over 500 properties affected*

As the Lead Local Flood Authority (LLFA) Wiltshire Council is required under the legislation to:-

- Develop a Local Flood Risk Management Strategy
- Manage the risk of flooding from surface water, groundwater and smaller watercourses.
- Investigate significant flood incidents
- Maintain a register of significant drainage assets
- Act as the approving body for adopting and maintaining Sustainable Drainage Systems (SuDs) on new developments when the legislation is introduced.

As lead LLFA the Council has the responsibility to coordinate the management of flood risk. The production of the LFRMS will enable the council to put in place the appropriate framework to ensure that the potential type and scale of flooding in the county and the associated risks are understood. The LFRMS will set out appropriate objectives, and include proposals on how they will be achieved.

The LFRMS explains:-

- The roles and responsibilities of Wiltshire Council as a Risk Management Authority and its management functions.
- How the council works with neighbouring authorities and others
- The objectives for managing local flood risk
- The measures proposed to meet these objectives
- How technically and financially and when these measures will be implemented.
- How we will develop, maintain, apply and monitor our LFRMS



*Flooding caused significant damage and disruption in Wiltshire in 2014, including here at Pitton where ground water flooding lasted several weeks.*

### **Key Principles of Local Flood Risk Management Strategy**

Wiltshire Council works closely with other Risk Management Authorities, stakeholders and local town and parish councils to better understand the flood risk and the actions that can be taken to reduce the risk to themselves and their communities.

The LFRMS has been developed in partnership with the other Risk Management Authorities as working together is essential if an effective local flood risk strategy is to be developed for the county.

### **Prioritising investment in reducing flood risk**

One of the principles of the LFRMS is to prioritise investment to ensure that where possible priority is given to those areas at greatest risk. However, consideration needs to be given to the cost to benefit ratio of schemes to ensure that investment is appropriate. It may be that



some areas of greatest risk are not or cannot be protected against flooding, whilst other areas at less risk have a more economically viable solution.



*At Marlborough a flood alleviation scheme was jointly funded by the Environment Agency, Wiltshire Council and Marlborough Town Council.*

The Council will work with Defra, the Environment Agency (EA), town and parish councils and others to enable the less cost effective schemes to go ahead where possible.

Wiltshire is the 14<sup>th</sup> largest county in England and it is not possible to provide detailed information on all future investment needs at this stage. In order to ensure the local strategy is effective the Council will work with its partners, stakeholders, town and parish councils and residents to ensure that the plan is updated on a regular basis, and that objectives and achievements are monitored.

The types of flood risk in Wiltshire are described in Section 4 of this strategy. The modelling of potential surface water flooding indicates that the communities in Wiltshire with the most properties at risk of flooding are Salisbury, Trowbridge, Warminster and Calne.

The flooding in Wiltshire between December 2013 and March 2014 affected a wide geographical area, but the villages of Aldbourne and Great Bedwyn were particularly badly affected, and the A360 near Tilshead was a particular concern.

Future development in the county is likely to focus on Trowbridge, Chippenham and Salisbury and Surface Water Management Plans have been developed for these towns.

The Council's Strategic Flood Risk Management Group meets every six months to review the progress on flood alleviation and the work of the Operational Flood Working Groups. As the understanding of flood risk in Wiltshire develops, the group will review the LFRMS, which will be amended to take account of additional information and changed circumstances. This Group will also review the Medium Term Plan to set priorities for future investment in flood risk management.

### **Individual responsibility**

Residents in Wiltshire have a vital part to play in this strategy. Property owners have responsibility with regard to protecting their property. Although Risk Management Authorities have legal powers and duties to manage flood risk within the county, individuals, communities and businesses all have a part to play.

Householders can assist by not putting inappropriate items or substances in drains, ditches and watercourses. They can protect their own homes by investing in property protection measures, especially if they are known to be at risk or have previously flooded. Landowners need to manage and maintain their ditches and watercourses appropriately in order to reduce the flood risk for local communities.

Local communities, Councils, businesses and landowners need to work together and take actions to help manage the flood risk. As the lead local flood risk authority, Wiltshire Council will need to secure funding for flood defence schemes, but communities, individuals and businesses need to be aware that local contributions may be increasingly needed to ensure the implementation of specific schemes.

## **Policies, Legislation and Regulations**

The LFRMS has strong links with other plans, policies and legislation such as those for the emergency, spatial and planning services. The strategy may need to be reviewed and amended in the light of any changing legislation, policies or circumstances.

### **Spatial planning**

Wiltshire's spatial planning service is required by national planning policy to ensure that development is safe from flooding and does not increase flood risk elsewhere. This strategy will support the work of the Council's spatial planning team in ensuring that flood risk is given adequate consideration in the development and review of planning policy; the consideration of planning applications; and the negotiation of suitable development contributions are obtained to reduce the future impacts of flooding.

### **Emergency Planning**

The Local Resilience Forum (LRF) was established in response to the Civil Contingencies Act 2004 and is aligned to the local police district. The aim of the forum is to ensure that relevant agencies and organisations plan and work together to ensure a co-ordinated response to emergencies that could have a significant impact. The LRF is made up of local Authorities, Environment Agency and health authorities, emergency services and others, and is responsible for planning and responding to emergencies, including flooding incidents.

The Council's Emergency Planning service does not duplicate the work of the LRF, but concentrates instead on ensuring that they have the best available data and information on flood risk and how they will deal with an emergency. The Council's Weather and Emergency Team and the Drainage Team work with the Council's consultants and contractors to respond to emergency events as required, which includes responding to flooding events.

### **Environmental Considerations**

A number of the rivers and watercourses in Wiltshire have a high ecological value, with many designated for their internationally recognised significance as Special Areas of Conservation, and national importance as Sites of Special Scientific Interest. In many cases water quality is an important aspect determining their ecological value.

In addition a large proportion of the county (over 60% of the area) is within Areas of Outstanding Natural Beauty, and many of the bridges are listed buildings or scheduled Ancient Monuments, which can make it difficult to address flood risk because of the level of protection applied to the structures. Water quality is also an issue with regard to the aquifers and water supply, and many of the watercourses have an amenity value to the local community.



*Drainage schemes in Wiltshire have provided the opportunity to establish and renew ponds, and improve the local environment.*

The LFRMS needs to be sustainable and ensure that any investment has benefits for both communities and the environment. This could be by ensuring that we work with nature where possible, especially when considering hard engineering solutions. The environmental benefits and impacts will be considered for each scheme during the development of options and proposals.

In recent flooding the vulnerability of sewage systems to groundwater flooding has been a particular issue, especially where high groundwater levels have persisted for some time. The potential surcharging of combined sewers in some urban areas is concern.

A summary of the main environmental factors considered in the development of the strategy are included in Appendix 1.

## 2. Aims and Objectives

### Strategy Aim

The aim of the strategy is to work with stakeholders, local communities and organisations responsible for managing flood risk to enable a better understanding of flood risk and thereby reduce the risk of flooding within the county where it is technically, environmentally, socially and cost effective to do so.

### Strategy Objectives

Wiltshire Council has adopted the following objectives to:-

- Improve knowledge regarding flood risk
- Improve protection from flooding
- Improve resilience to flooding
- Improve the environment
- Improve communications about flooding issues

Wiltshire Council will seek to

- Improve the level of understanding of local flood risk amongst partners and stakeholders,
- Ensure that local communities, residents and businesses understand their responsibilities with regard to local flood risk management,
- Maximise the partnership working with flood risk partners and stakeholders,
- Actively manage flood risk associated with new development proposals
- Ensure the approach to Flood Risk Management is sustainable and balance the economic, environmental and social benefits from policies and programmes,
- Improve or maintain the capacity of existing drainage systems by targeted maintenance where appropriate,
- Encourage responsible maintenance of privately owned flood defence and drainage assets,
- Establish a policy on water management, and use available information on flood risk to assess the suitability of the allocation of sites for different land uses through the local development framework,
- Maximise opportunities to reduce surface water runoff from catchments,
- Identify projects and programmes which are affordable and maximise capital funding from external sources,
- Ensure environmental consequences are considered in the design, construction and implementation of proposed flood risk management measures.

Wiltshire Council cannot deliver the objectives of the strategy on its own, and will continue to work with other stakeholders. Key stakeholders include:

- Flood Risk Management Authorities as defined by the Flood and Water Management Act 2010, which includes the Environment Agency, Water Companies and other local authorities,
- Other flood risk management stakeholders who have a responsibility for drainage and flood risk management, or may be affected by the local strategy, including Network Rail, Highways Agency, English Heritage, Canal and Waterways Trust, Natural England,

- Town and parish councils, local flood action groups, communities, businesses and individuals.

On specific projects, such as flood alleviation schemes, the Council often establishes local project teams to establish strong links with local communities, and works in partnership with other flood risk management authorities, including the Environment Agency, water companies and town and parish councils.

Wiltshire Council has already established good links with many flood risk management stakeholders and the public, and works with them through the Strategic Flood Risk Management Group and the Operational Flood Working Groups.

### **3. Responsibilities and Functions of the Council and other Risk Management Authorities**

#### **Wiltshire Council**

The Flood and Water Management Act gives Wiltshire Council the responsibility of the Lead Local Flood Authority for the county, and with this comes several responsibilities and functions:-

- To develop, maintain, apply and monitor a strategy for local flood risk management, which is guided by the national strategy.
- Strategic leadership of local flood risk management authorities
- The powers to request information from people in connection with their authority as Lead flood risk management authority.
- A duty to investigate and publish report on flood risk incidents in Wiltshire, where appropriate and necessary, and to identify which authorities have the 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 significant effect on flood risk.
- Power to undertake work to manage flood risk from surface water runoff or groundwater
- To act as the Sustainable Drainage Systems (SuDs) approving body when the legislation is enacted, with responsibility for approval, inspection, adoption and maintenance of new sustainable drainage systems.
- Responsibility for determining whether a third party can undertake works on ordinary watercourses that may affect water flow can take place.
- To contribute to the achievement of sustainable development in the exercise of flood risk management functions and to have regard to relevant guidance.

#### **Regional Flood and Coastal Committee**

The Regional Flood and Coastal Committees are responsible for guiding flood and coastal risk management activities within catchments and along coasts, advising on and approving programmes of work for their areas as well as raising local levies to fund local priority projects and works in partnership with others. All lead local flood authorities in the region have representation on the committee, which is proportionate to the number of properties in their area.

Wiltshire is part of the Wessex and Thames Regional Flood and Coastal Committees, and has one member on the Wessex Committee and is represented by the Oxfordshire County Council representative on the Thames Committee. The committees are responsible for administering the local levy, which is a fund paid into by each authority in the region.

#### **Environment Agency**

The Environment Agency has specific responsibilities in relation to flood risk management and these include:-

- Strategic overview of flood and coastal erosion risk, including flooding from the sea, rivers, surface and ground water,
- Development of the national strategy to cover all forms of flood risk,

- Responsible for managing the risk of flooding from main rivers, the sea and reservoirs. This includes operating, maintaining and replacing flood risk management installations such as sluices, pumping stations, flood barriers and gates,
- Powers to request information from any person in connection with the Environment Agency's flood and coastal erosion risk management functions,
- A duty to report to Ministers on flood risk management including implementation of strategies,
- A statutory consultee to the SuD's approving body on sustainable drainage,
- The ability to issue levies to lead local flood authorities.

The county of Wiltshire is covered by two regional EA offices which are based on the catchments areas within the county. Three small areas in the north, east and south of the county are in the South East Region. The majority of the county is in the Wessex area, and the primary link with Wiltshire is the Blandford Forum office.

### **Water Companies**

Wiltshire is in the area of four water companies, Wessex, Thames, Southern and Sempcorp Bournemouth and Veolia. The two main companies are Wessex Water and Thames Water. Wessex Water covers the largest part of Wiltshire, with Thames Water mainly concentrated in the north of the county.

The water companies are responsible for maintaining and operating the condition of the sewage systems, comprising of foul water, surface and combined sewage systems. Their responsibilities include the adoption of private sewers, and they will be statutory consultees to the SuDs approving process.

The flood risk management responsibilities of sewage companies include:-

- Responding to flooding incidents,
- Producing a DG5 register which lists those properties that have experienced a sewer flood,
- Working to alleviate sewer flooding problems.

### **Other Flood Risk Management Stakeholders.**

Other organisations have a role to play in local flood risk management, and have a responsibility for drainage of flood risk management, or may be affected by the strategy. They may require engagement for support in flood alleviation projects, dealing with flooding issues or to provide information. Other stakeholders include landowners, Ministry of Defence (MoD), Network Rail, Highways Agency, and public utilities. The Council works with these stakeholders individually or through the Operational Flood Working Groups.

The Highways Agency are responsible for the motorway and trunk road network, and manage extensive drainage systems, including bridges and culverts carrying the roads across rivers and watercourses. Wiltshire Council is the local highway authority responsible for most of the other roads in the county.

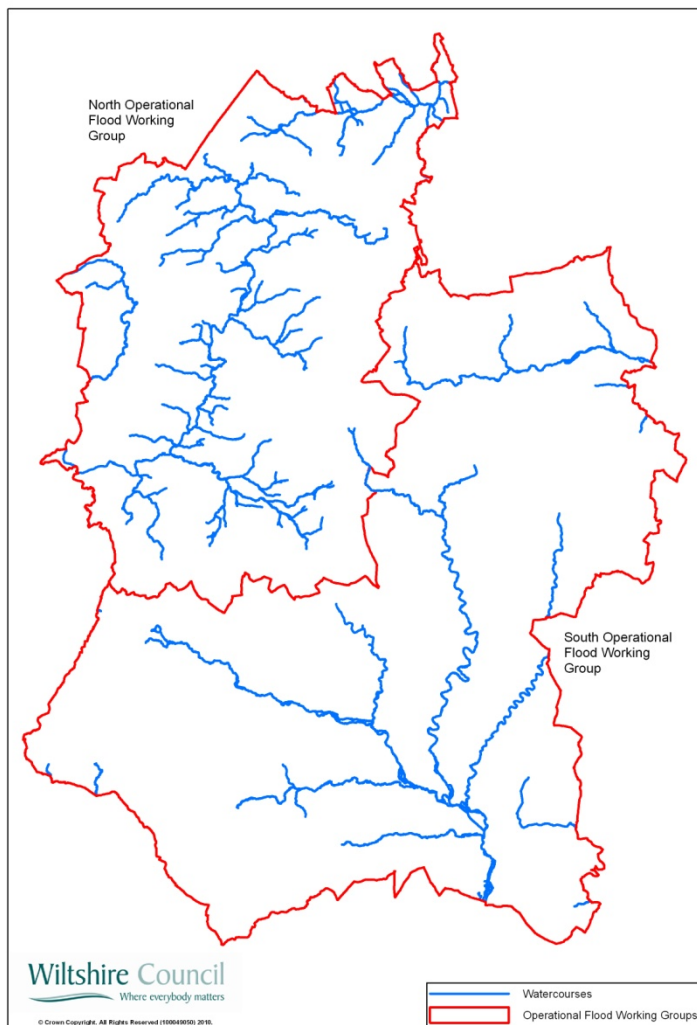
A list of the main stakeholders in Wiltshire with regard to flood risk management is included in Appendix 2.

## 4. Understanding Flood Risk in Wiltshire

### Types of flood risk

Flood risk within Wiltshire is often a complex interaction between river, surface, ground water and sewer flooding, and the local geology can be a significant factor.

The type of flood risk that occurs in different parts of Wiltshire is influenced by the two main geological areas within the county, each covering almost half the county. The northern area is predominately underlain by clay deposits, and the southern area is mainly underlain by chalk. Each of these areas has different characteristics, and different flooding mechanisms.



*The northern part of the county is predominantly on clay with surface water flooding being a significant cause of flooding. In the south there is chalk with more ground water flooding issues*

The geological characteristics in the northern half of the county often leads to potentially high runoff rates because of the impermeable nature of the clay deposits and associated soil structure, which can often have effects similar to those experienced with large paved areas during periods of heavy rain. This can give rise to rapid flooding and property inundation in some circumstances.

The southern area is predominately underlain by chalk aquifers. The aquifers act as underground reservoirs storing water. When these reservoirs reach a state of saturation due to capacity constraints, groundwater flooding can occur. Overland flow can also occur, thereby compounding the issue and leading to the filling up of local watercourses and



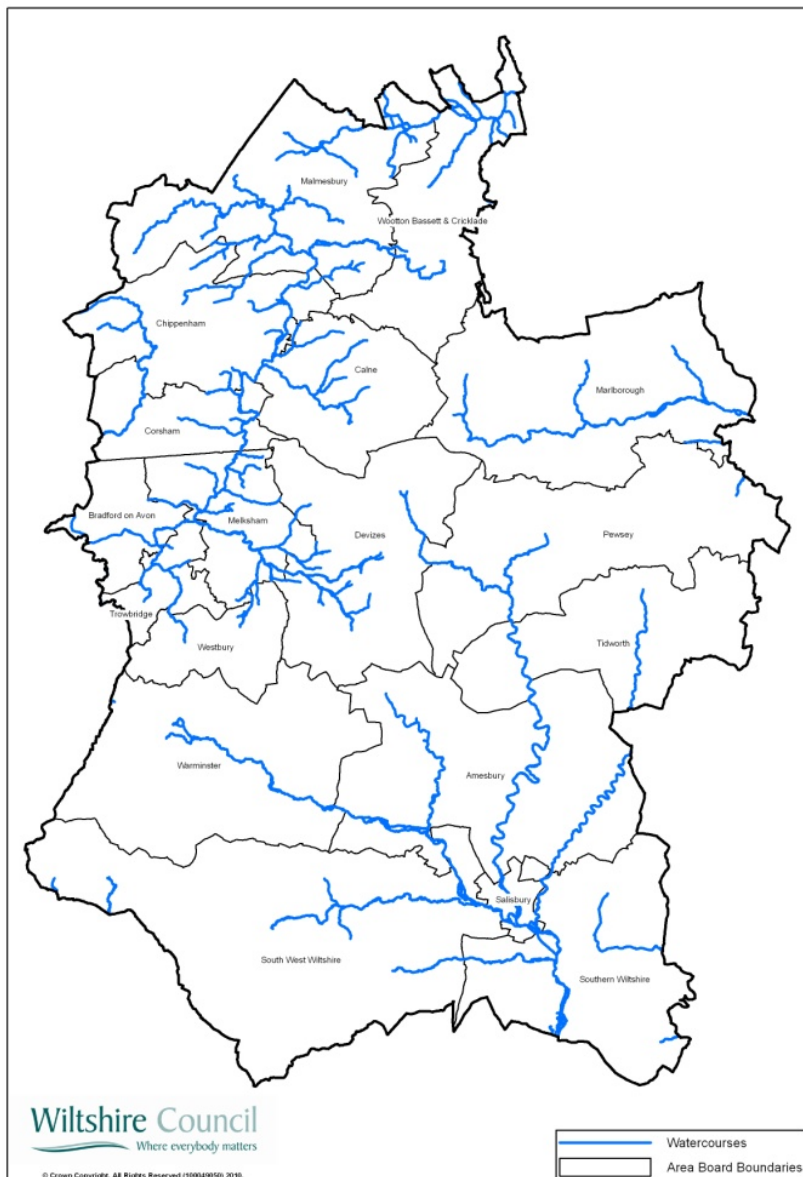
agricultural drainage ditches. Properties can be affected by groundwater flooding through water rising upwards from below ground, as well as by surface water flooding. When the aquifer's reach or exceed their natural storage capacity, further prolonged rainfall will lead to surface water runoff, often causing further flooding.

Substantial work has been carried out by the EA in connection with flooding from main rivers in recent years, and the understanding of the mechanisms of how individual rivers operate has improved significantly. However, knowledge regarding flooding from other sources such as groundwater, surface water runoff and ordinary watercourses is less developed.

In Wiltshire there can be combinations of surface water runoff, groundwater flooding and flooding from main rivers occurring at the same time.

## River flooding

There are five main river systems within Wiltshire. The EA is responsible for rivers and some watercourses designated as being of strategic importance. These include the Thames, Bristol and Hampshire Avon, Dunn and Stour, and the main tributaries of these rivers.



*There are five main river systems within Wiltshire: the Thames, Bristol and Hampshire Avon, Dunn and Stour*

Wiltshire's Strategic Flood Risk Assessment (SFRA) and Catchment Flood Management Plans (CFMP) identify flooding from rivers as a risk in the urban areas of Bradford on Avon, Chippenham, Malmesbury, Marlborough, Melksham and Warminster and Salisbury.

The **Hampshire Avon**, including the Nadder, Wylye, Till, Bourne, Ebbles and Nine Mile River have tributaries within Wiltshire. This catchment is 96km long and includes most of the south of the county. Much of this system has a typical chalk stream character, with winterbournes in the upper reaches. The Nadder and some of the upper reaches of the Avon are fed from clay catchments and can rise and fall quickly in response to rainfall. Communities in Wiltshire alongside the river include Upavon, Durrington, Amesbury and Salisbury, all of which have previously been affected by flooding.



*In early 2014 high river levels on the Hampshire Avon at Salisbury were a concern. There was a risk of serious flooding in the city through a combination of river, surface water and ground water flooding.*

The **Bristol Avon**, includes the Biss, By, Semington and Brinkworth Brooks and River Marden in Wiltshire. This catchment is 2,308 km<sup>2</sup> and covers the north west of the county. It is fed by calcareous water from its tributaries, flows through impervious clays, and rises quickly after rainfall. Communities within Wiltshire affected by flooding from the Bristol Avon include Malmesbury, Chippenham, Melksham and Bradford on Avon.



*In 2014 Wiltshire Council worked with the Environment Agency to install temporary flood barriers to help protect Bradford on Avon from flooding from the Bristol Avon.*

The **Thames**, which includes the Upper River Kennet, and the Ray, Cole, Key, Churn, Bydemill Brook, Swill Brook and Thames within Wiltshire. This catchment is 9,948 km<sup>2</sup>, and part of which covers the north-east part of the county. The Kennet within Wiltshire has a typical chalk stream character. The remaining rivers are spring-fed from the Cotswold limestone and are lowland clay rivers influenced by calcareous clays. Only a small part of the Thames flows through Wiltshire, but Cricklade has been affected by flooding from this river in recent years.

The **River Dun**, a very small part of the upper catchment of the Test and lies in the south-east corner of the county. The river has a chalk stream character in Wiltshire. The major settlement affected by flooding from the Dun within Wiltshire is the market town of Marlborough.

The headwaters of the **Dorset Stour**, the Shreen and Ashfield waters, rise in the south-west of the county. The source of the River Stour lies within the Stourhead Estate, where it forms part of a series of artificial lakes and reservoirs before flowing south into Dorset.

The EA carries out mapping and modelling of main rivers and uses this information to prepare flood maps of those areas at risk. The maps are derived from modelling, and data collected from past events. They show the potential extent of flooding, and help predict the likely impact of future flood events. The information is published, and has proved helpful in increasing awareness of flood risk.

The Environment Agency has produced catchment flood management plans for every catchment in England and Wales, and Wiltshire is covered by three catchment management plans:-

- The Bristol Avon Catchment Management plan covers the areas around Malmesbury, Chippenham, Calne, Devizes and Westbury
- The Hampshire Avon Catchment Management plan covers the areas of Pewsey, Warminster, Amesbury, Salisbury and Downton
- The Thames Catchment Management Plan covers the areas around Cricklade

These plans aim to identify the flood risks and factors that contribute to flooding incidents and how these risks should be managed over the medium to long term. A range of policy options are outlined in the plans and options of how the flood risk should be managed in each area according to the type of flooding.

## **Surface Water**

Surface water flooding, also known as pluvial flooding, occurs when prolonged periods of rain falls on saturated ground. As the water cannot percolate into the ground it tends to generate run off which flows over the surface and ponds in low lying areas. This type of flooding is also often associated with high intensity rain storms which can be of short duration. The circumstances that lead to surface water flooding from storm events are generally linked to saturated ground conditions, or rain water falling on hard impervious land.

Drainage systems can be quickly overrun by sudden increases in surface water, causing water to flow or pond on the surface. This type of flooding can be very difficult to predict, and until recently comparatively little was known about the mechanisms of surface water flooding.



*Surface water flooding can occur with little warning as a result of intense rainfall as at Bradford on Avon on Christmas Eve in 2013.*

Surface water flooding is much better understood as a result of recent national and local modelling and mapping. The Preliminary Flood Risk Assessment (PFRA) 2010 required that all the available data was analysed from the Environment Agency and local information was drawn together and is known as the “agreed surface water information”. This is being reviewed and updated. The Flood Map for Surface Water represents the best information available on areas which are most likely to flood, and is a key source of information on the risk of surface water flooding.

Surface Water Management Plans (SWMP) have been prepared for the larger towns of Chippenham, Trowbridge and Salisbury. Further studies are being considered for other towns, including Melksham and Malmesbury. From the work carried out so far indications of the numbers of properties at risk in some specific areas have been identified.

<b>Community</b>	<b>Area of Potential Problem</b>	<b>Approximate number of Properties at risk for a flood with a 1 in 30 chance in any given year.</b>
Trowbridge	Bramley Lane Area	150
	Timbrell Street Area	165
	Drynham Road Area	300
Chippenham	Langley Park	230
	Eastern Avenue	320
	High Street	125
Salisbury	Hardenhuish Brook	500
	Central	1100
	Churchill Way area	690
	Bemerton	490
	Laverstock	670

In 2012/13 the villages of Great Bedwyn and Whitley experienced high intensity storms, which deposited large volumes of water over the area in a short space of time resulting in drainage systems being overwhelmed and properties flooding as a result of surface water runoff. The extensive flooding in Wiltshire in 2013/14 included significant problems with surface water runoff as well as flooding from groundwater.



*At Tollard Royal surface water flooding damage to a building required the road to be closed to traffic in 2014.*

It is estimated from surface water modelling carried out for Defra that over 16,000 properties in Wiltshire are at risk of surface water flooding in an extreme event. Over half of the properties at risk are located in ten settlements:

<b>Community</b>	<b>Number of Properties at risk</b>
Salisbury	2100
Trowbridge	1600
Warminster	1200
Calne	1100
Melksham	790
Westbury	690
Chippenham	690
Pewsey	610
Aldbourn	600
Marlborough	570

The assessment gives an indication of the scale of possible risk, but does not provide sufficient information to enable individual properties to be identified. Flooding from surface water is a potentially serious issue for many communities in Wiltshire.

### **Groundwater Flooding**

Groundwater flooding occurs as a result of water rising to the surface from the underlying rock strata, known as aquifers. Groundwater flooding within Wiltshire mainly occurs in the south of the county, due to the nature of the underlying chalk deposits, when the water tables are high, and additional rainfall causes the aquifers to fill and the water to rise out of the ground. This type of flooding can continue for weeks, even months, as until the groundwater levels start to drop the water remains on the surface. Often there is little that can be done to prevent groundwater flooding, and protecting properties at risk of this type of flooding can be both difficult and expensive.



*Ground water flooding affected the A360 for a number of weeks in 2014, requiring temporary traffic management measures to be introduced.*

Current understanding of groundwater flooding is limited because of the technical complexities of understanding the flow and emergence of groundwater. The current approach focuses on areas that are known to be susceptible to groundwater flooding.

The EA have produced maps detailing Areas Susceptible to Groundwater Flooding, but the level of confidence in the accuracy of the information means the maps should only be used to identify broad areas at risk rather than individual properties. The areas most susceptible to groundwater flooding in Wiltshire are in the south and south-east of the county, which are on the chalk aquifer, but there are areas in the north of the county that are also susceptible to groundwater, particularly those areas underlain by sand and gravel deposits.

In 2012 groundwater levels rose significantly in the Salisbury area, and there were concerns about the possibility of flooding in the south west of the county, but fortunately levels reduced in the spring. However, in 2013/14 the ground water levels rose to their highest levels recorded and there was flooding at many locations, especially in the south of the county.

### **Sewer Flooding**

In times of high intensity or prolonged rainfall events the capacity of sewer systems can be exceeded, with consequent problems. They can also be affected by groundwater entering the systems. Wessex Water and Thames Water manage many of the water sewers within the county, and the Council works with the water companies regarding sewer related flooding incidents.

There have been sewer related flooding incidents in recent years with both Wessex Water and Thames Water systems. The incidents are often related to local surface water or groundwater flooding.



*Groundwater caused serious sewer flooding in the village of Aldbourne in 2014*

In recent flood events both Thames and Wessex Water have used road tankers in rural communities to help reduce the risk of flooding and contamination from the high levels of groundwater affecting their systems. There are significant costs associated with the use of tankers during prolonged flooding events as experienced in 2014.

### **Breach or failure of reservoir, dam or canals**

The inspection and maintenance of reservoirs is strictly governed by legislation as a flood incident could involve a significant amount of water and debris, and the management of flood risk from dams and reservoirs is vital. Reservoirs are categorised according to size, risk and location. Information about reservoirs within Wiltshire is held by the EA and Local Resilience Forum.

There is a potential risk of flooding from other sources such as canals, which are the responsibility of the Canal and Waterways Trust. Work is being undertaken by volunteers to reinstate a number of the disused canals in Wiltshire, with some sections of disused canal having already been restored. This work has the potential to assist in reducing flood risk, but in some cases there may be flood risk implications, and consequently the Council has established a close working relationship with those promoting schemes and with the Canal and Waterways Trust.

### **Highway Flooding**

Wiltshire Council is the authority responsible for the provision and management of most of the highways within the county, and for the provision, maintenance and management of most highway drainage. The Highways Agency is responsible for the motorway and Trunk Road network (M4, A303, A36, and A419), and there are a number of private roads, including roads owned by the MoD.

Historic information on flooding of highways is very limited and has been mainly used to inform maintenance procedures. The annual maintenance programme for highway drainage takes into account areas of known flood risk, and there is a regular programme of gully emptying and cleansing. As part of most major carriageway maintenance schemes, the existing highway drainage is inspected, repaired or replaced as needed.

The Council's local highways engineers report flooding incidents to the drainage team for investigation and the development of schemes. Information on incidents is also received from members of the public, town and parish councils and also from the operational team who respond to incidents on the highway. This information is recorded in order to add to the understanding of flooding within the county, and to assist in developing future schemes to improve drainage.



*A number of roads in Wiltshire had to be closed or traffic movements restricted because of flooding in 2014.*

The priority with regard to highway drainage is to ensure that high speed roads are kept clear of standing water as far as possible for safety reasons, but in extreme flood events the highway network can be disrupted as a result wide spread flooding. In recent flood events it became necessary to temporarily close some roads until flood levels reduced.

The Highways Agency is responsible for motorways and trunk roads, including maintaining the structures and drainage infrastructure. The Council works with the Highways Agency to reduce the flood risk associated with these roads.

### **Historic Records of Flood Risk**

Information about past flooding is often difficult to obtain and any records held do not necessarily contain complete information, such as depth, speed and direction of flow or size of area affected. It can be difficult to obtain the information required to improve our knowledge of flood risk.

Wiltshire council have been responsible for land drainage since it became a unitary authority in 2009. The information held by the former district councils is mainly in paper format and can be difficult to review and analyse. The town and parish council records are stored in paper format and considerable resources are necessary to access them, and many do not record all incidents. Information is also often anecdotal as there are few records and insufficient data is available to provide definitive conclusions regarding the consequences of historic flooding. An initial screening exercise was carried out for the Preliminary Flood Risk Assessment (PFRA) which indicated that the information generally lacks the necessary details to be a valuable contribution to our knowledge of flood risk.

Following a request from Wiltshire Council for community flooding information in 2009/10 some historical information was gathered directly from the town and parish councils which gives an indication of the number of properties affected by previous flooding events:-

<b>Community</b>	<b>Approximate number of properties reported as having flooded</b>
Dauntsey	46
Purton	41
Teffont Evias	37
Leigh	35
Minety	31
Crudwell	31
Shalbourne	22
Easterton	20





*Wiltshire Council's staff and contractors responded to many requests for assistance during the flooding in 2014.*

During the flooding in 2013/14 the communities with the most residential properties reported as having experienced flooding were:

<b>Community</b>	<b>Approximate number of properties reported as having flooded</b>
Aldbourn	35
Great Bedwyn	20
Bishopstrow	20
Salisbury	15
Chilmark	14
Codford	15
Dauntsey	13
Coombe Bissett	13
Tilshead	11
Bradford on Avon	10
Malmesbury	9
The Altons	9
Boynton and Corton	8
Fovant	8
Melksham Without	8
Beanacre	7
Britford	7

It is apparent that there are often more properties flooded than are reported to the Council, but the information collected during these events does help identify some of the areas at potential risk. The establishment of Flood Wardens and closer working with the parish and town councils is helping to obtain more accurate information. There can be a reluctance to report property flooding because of concerns about effects on insurance premiums and property values. The Council is working with those communities most at risk of flooding to help develop Flood Plans and establish Flood Wardens

**Climate Change**

The projections for future climate change are that it is likely that winters will become significantly wetter and extreme winter precipitation will increase. In summer there is likely to be less overall rainfall but intense heavy downpours are anticipated. As the main cause of surface water flooding is this storm rainfall, there is likely to be an increased risk of river and surface water flooding, but there is also likely to be an increase in groundwater flooding.

Climate UK anticipates that without action to address climate change we could see increases in the frequency of flooding affecting people's homes and wellbeing, especially for vulnerable groups and the operation of businesses and critical infrastructure systems. Data

within the UK Climate Change Risk Assessment suggests that 1 in 100 year flood events in the UK are projected, on average, to become approximately twice as frequent by the 2050s, and three to five times more frequent by the 2080s.

Surface water management plans and strategic flood risk assessments take account of the potential impacts of climate change, which is limited by our current knowledge. Climate change has significant implications for flood risk and needs to be considered when assessing potential risk and developing new proposals.

## 5. Managing local flood risk

Wiltshire Council's Local Flood Risk Strategy will seek to

- Improve knowledge regarding flood risk
- Improve protection from flooding
- Improve resilience to flooding
- Improve the environment
- Improve communications about flooding issues

### Improving Knowledge

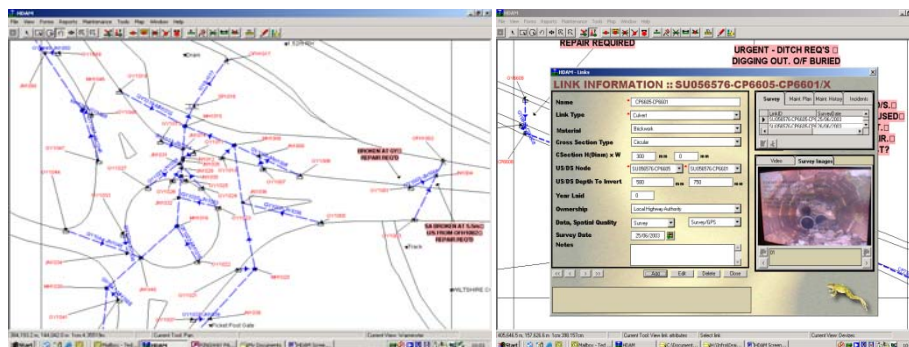
In order to understand the county's flood risk better a number of studies have been completed or will be undertaken.

Study	Description
Preliminary Flood Risk Assessment (PFRA)	This document provides a summary of historic and predicted flood risk across Wiltshire and was completed in 2011. No areas of significant flood risk in accordance with the legislation were identified. This assessment will be updated every 6 years.
Strategic Flood Risk Assessment (SFRA)	The National Planning Policy Framework requires that local planning authorities address the risk of flooding by directing development away from areas at risk of flooding. In order to achieve this aim, local planning authorities are advised to prepare and maintain a Strategic Flood Risk Assessment (SFRA) utilising data provided by the Environment Agency. The SFRA is used as a tool for the purposes of preparing local plans and assisting with the process of determining planning applications. In terms of content, the SFRA presents a series of maps detailing the areal extent of critical flood risk zones associated with main watercourses across Wiltshire. In addition, it provides practical policy advice on the application of the 'sequential' and 'exception' tests.
EA updated Map for Surface Water Flooding	The map for surface water provides information on areas within Wiltshire susceptible to surface water flooding.
Surface Water Management Plans	SWMPs have been prepared by Wiltshire Council for Trowbridge, Chippenham and Salisbury. Further studies are being actively considered for Warminster, Malmesbury, Melksham and Bradford on Avon. Further studies will be undertaken as resources permit.
Local Catchment studies	Studies are currently being carried out by Wiltshire Council regarding flood risk in the local communities affected by the 2013/14 flooding, including Tilshead, Chilmark, Chitterne and others. A study in Castle Combe is being undertaken by the EA with assistance from Wiltshire Council. Consideration will be given to further local studies in response to particular events.
Other Studies	Site specific studies will be undertaken at locations of particular risk of flooding as identified by the Council's Operational Flood Working Groups. These will often involve partner organisations.

The Council will work with other organisations in order to get a better understanding of flood risk in Wiltshire. The Council will support the EA with regard to collecting information, studies and surveys where there is a common interest in understanding the causes of flooding. The Council will work with other organisations to develop a standard method of recording flood events in order to ensure consistency and accuracy of reporting.

The Council will work with other organisations with responsibility for infrastructure that may have flood risk implications, including Network Rail, Highways Agency, the Canal and Waterways Trust, MoD, landowners, town and parish councils. The Council will share information with other organisations as required, especially in connection with partnership and project working, and will establish early in the development of projects what can be shared and how.

The Council will record and analyse flooding incidents in order to get a better understanding of the causes and potential means of mitigation and flood protection, including working with the LRF, emergency services, local Councils and others holding relevant information.



*Wiltshire Council has a programme of CCTV drainage surveys to record and maintain its drainage assets.*

The Council as LLFA will investigate flood incidents and determine which authority has the relevant flood risk management functions. The outcome of the investigation will be reported to the relevant flood risk management authority. The criteria for investigation will be as has been agreed by the South West Flood Risk Managers Forum, which would be where five or more residential properties are flooded, or one or more non-residential, or where critical services or infrastructure are flooded. Other incidents may be investigated subject to resources.

The Council will establish and maintain a register of structures and features, which in the opinion of the authority are likely to have a significant effect on flood risk in its area and record information about each of them which includes the state of repair and ownership. This is a requirement of Section 21 of the Flood and Water Management Act 2010.

The coordination of joint working and sharing of knowledge with others at a local level will be managed through the Operational Flood Working Groups.

## Improving Protection

The council will consider a wide range of approaches from an early stage to focus on the places with greatest flood risk. Specific measures to reduce the flood risk at particular locations will be developed following studies, surveys and modelling as required to identify appropriate proposals. The measures will generally be consistent with the following principals:

- Studies may be undertaken to identify suitable mitigation measures to reduce flooding at specific locations,
- Structural, non-structural or adaptation measures may be proposed,
- Measures proposed should generally provide a wide range of protection,
- The benefits and costs associated with proposals will be considered,
- Funding from others should be encouraged in order to identify opportunities for joint funding of proposals,
- Measures which are not feasible should be discarded at an early stage,
- A preliminary assessment should be carried out of potential funding sources and how to access them.
- The cost and benefit of the proposals should include social, heritage, ecological considerations,
- Engagement with stakeholders, local Councils, members and the public should be undertaken to encourage involvement,
- The preferred measures should have benefits which justify the costs,
- The preferred measures should have a reasonable chance of being funded, and consideration should be given to the beneficiaries providing a degree of funding.
- The preferred measures should contribute towards sustainable development,

In view of the high cost of large scale flood protection measures and the limited budgets available, it is unlikely that the Council will be able to fund large scale schemes. Where there is a realistic chance of success and appropriate measures are identified the Council will explore joint funding of schemes with others.

The Council has a Medium Term Programme which is included as Appendix 4. The list of schemes will be regularly reviewed and agreed by the Council's Strategic Flood Risk Management Group in conjunction with the Operational Flood Working Groups. The programme may be reviewed and adjusted to reflect circumstances, improved knowledge or changed conditions.





*Wiltshire Council has an extensive programme of flood alleviation and drainage improvement works, with an annual budget of currently £1,000,000*



In the longer term the Council will work with other organisations, including the EA to identify options for reducing flood risk in the largest communities and those most at risk. This will include proposals for Salisbury, Trowbridge, Warminster and those towns and villages with the most properties at risk.

Individual property protection measures may be a realistic option in many places, and where appropriate property owners will be encouraged to install such protection. Funding from the Council or other sources for individual properties is unlikely to be available in most cases, and property owners need to be aware of their responsibility to protect their own property.

Where physical flood protection is not feasible consideration will be given to measures to increase resilience and recovery.

## Improving Resilience

Wiltshire Council will continue to be a member of the Local Resilience Forum (LRF), and will work closely with other organisations, including the EA, health and emergency services to improve the response to emergencies, including flooding. Wiltshire Council will usually take the lead in dealing with recovery from any flooding incident.

The Council has developed operational plans for the Severe Weather and Drainage team, which focus on those areas most at risk of flooding. Information on the extent of possible flooding and vulnerable highways and services will be available for use by operational staff in the event of flooding incidents. This information will be updated in the event of incidents or as further information become available.



*Wiltshire Council has an established network of Flood Wardens, and works with the Environment Agency on workshops and awareness events.*

The Council will encourage town and parish councils to prepare emergency plans, specifically if they have previously experienced or are at risk of flooding. Support will be provided for the use of Flood Wardens to help local communities to cope with flooding incidents, including the provision of equipment and training where appropriate.

The Council will encourage residents and communities to make use of the EA's free flood warning service to those who are at risk of flooding. However, it is appreciated that similar flood warnings do not currently exist for surface water flooding or groundwater flooding, and the Council will work with the EA in developing warnings for this type of flooding.

## Improving the Environment

Wiltshire Council will renew and maintain its drainage assets so that they function effectively and work correctly. In many cases there are currently limited records of drainage assets, and a programme of recording and reviewing their condition has been underway for a number of years. This process, including the use of CCTV surveys of the drainage systems will continue as funding allows.



*Wiltshire Council has an ongoing programme of CCTV surveys of drainage systems to identify where they are not working properly.*

When upgrading or improvement works are undertaken on watercourses the Council will have regard to the environmental and ecological considerations to reduce the impact of the scheme, and where practicable will improve environmental protection. The Council will work jointly with town and parish councils and other organisations, on enhancement works when appropriate opportunities arise.

The Council will carry out consenting and enforcement on ordinary watercourses to control activities that might have an adverse effect on flooding. The Council has the authority to attach reasonable conditions to any Consent issued under Section 23 of the Land Drainage Act. Landowners considering carrying out any works affecting a watercourse are encouraged to contact the Council's drainage team at an early stage.



The Council recognises that new development can affect the occurrence and significance of flood events. However, new development can also provide opportunities to reduce flood risk



through sustainable drainage systems and improved design codes to deliver increased resilience. The opening up of river corridors, and use of open spaces for temporary storage of water in times of flood, will be encouraged provided this does not lead to unacceptable impacts on the environment.

### **Sustainable Drainage Approval Body**

Once the relevant legislative provisions have been enacted the Council will become the Sustainable Drainage Approval Body (SAB) for Wiltshire, and this will ensure close links with the planning approval process associated with the management of new developments. It is intended that through the requirement for sustainable drainage systems, new development will not add to flood risk in Wiltshire.

The role of the SAB will be to determine whether proposed drainage systems for new developments, including the redevelopment of land and buildings, are acceptable and fit for purpose before construction begins, as well as ensure that proposed drainage systems meet national standards for design, construction, operation and maintenance.



*New developments and drainage schemes in Wiltshire have provided opportunities to introduce ponds and swales to improve water quality and habitat*

Adaptation to the potential effects of climate change on flood risk is likely to be a gradual process, and resilience to flooding is expected to progressively increase. The current modelled impacts of climate change on flood risk underline the need for effective surface water management. Detailed surface water management plans will continue to model the possible impact of climate change, and therefore enable consideration of the need to identify and prioritise mitigation actions.

The Council will use the SAB process to work with other organisations, including neighbouring authorities to reduce flood risk, and encourage appropriate development.

## Improving Communications

Wiltshire Council communications with town and parish councils and community groups regarding flooding issues will be mainly through the Area Boards, Operational Flood Working Groups, Parish Newsletters, or with individual communities on specific projects.

Communications will need to be effective to ensure that residents and businesses are fully informed about the work Wiltshire Council is doing to reduce the likelihood of future flooding. They also need to be informed of the flood risk they face, any actions they can take to mitigate that risk, how they can be actively involved in flood risk management mitigation work, and what precautions to take in the event of a flooding incident.

The Council, together with other risk management authorities, will continue to identify the risk of flooding across the county, and will encourage local communities to take actions to mitigate this risk. The key messages to be communicated are:

- How we are working with different organisations to deliver local flood risk management and the importance of their involvement.
- How individuals and communities should take responsibility to reduce the impact and their vulnerability to flooding.
- Recognising that we cannot prevent all flooding, but by working together we can try and manage the risk thereby mitigating and reducing the probability and consequences flooding

Where communities are at serious risk of flooding, stakeholders will be engaged in the development of proposals. This will include other risk management authorities, the public, town and parish councils and any local community groups as appropriate. As proposals are developed they should consider how stakeholders will be engaged in the plan at the right level, and at the appropriate stage, to ensure that as far as possible the proposed works are supported by the stakeholders and are appropriately funded.



*Wiltshire Council holds regular flood awareness events, including this one in June 2014 with the Environment Agency and Dorset County Council at Salisbury.*

The nature and consequences of flooding vary between locations and communities, as does the best means of engaging with them. A variety of methods may be used to engage with the local community, including assistance from the Area Board, town and parish councils, and the use of local radio, leaflets, adverts on community notice boards, or drop in sessions.

Wiltshire Council will use its website, press, radio, television and social media to create awareness of what it is doing to with regard to the management of flood risk, and to communicate important messages to the public. An open and transparent approach will help assure the public of the Council's ongoing commitment to flood risk management.

In times of widespread flooding when limited resources are stretched, and with the difficulty in moving resources during flood events, it would not be realistic to expect the Council to be able to attend every incident. Public expectations will need to become more focussed on self help rather than relying on the local authority or others to protect them from flooding. The

message from the Council will need to be consistent in reminding home owners and businesses of their responsibility to protect their own properties from flooding.

## **6. Funding**

Funding is a key element of managing flood risk, and can be a constraint on progress. Without funding schemes are unlikely to be progressed, and consideration must be given to how the Council funds flood alleviation, resistance, resilience and asset maintenance in order to full fill its role as the LFRM for the county both now and in the future.

Currently flood risk management in Wiltshire is comparatively well funded compared to many other local authorities, with funding of £1,000,000 for 2014/15. In addition the Council has been awarded £282,000 for emergency repairs following the 2013/14 flooding. The Council will continue to bid for funding as opportunities arise.

Funding can be sourced in various ways, and the following gives a brief outline of where the Council may consider raising money in order to fund actions and priorities. As a rural county Wiltshire can have difficulty in competing with the larger urban conurbations for grant aid towards flood alleviation schemes, and although that does not preclude the county from making applications as and when opportunities arise, consideration needs be given to other funding streams.

### **Flood Defence Grant Aid (FDGiA)**

Government funding is provided through Defra and is administered and managed by the EA, with approval from the Regional Flood & Coastal Committees (RFCC). The FDGiA has historically been the major source of funding for both flood risk management and coastal defence schemes.

To apply for funding for flood defence schemes strict criteria need to be met, particularly to demonstrate that the expected whole-life benefits exceed the whole life costs of the scheme. Additionally projects need a strong partnership base, and should investigate all possible benefits to help obtain contributions from other sources, which includes ensuring that outcomes of these measures do not just involve the capital construction outcomes but also touch on health, education and deprivation.

### **Local Levy**

This levy is made up of contributions from Local Authorities and is used to support flood risk management projects that do not attract FDGiA funding. This allows locally important projects to take place, and where schemes can demonstrate that the outcomes will help regional priorities it is more likely to attract this type of funding.

Schemes at Crudwell and Easterton were beneficiaries of local levy funding for Individual Property Protection Schemes, which were carried out in conjunction with the Environment Agency in 2011/12.

### **Local Authority Funding**

As well as funding specifically available to Wiltshire in their role as LLFA, the Council also has its own funding for capital projects and revenue programmes which may be used for flood risk management purposes. Currently an ongoing programme of flood alleviation and drainage schemes are co-ordinated through the Operational Flood Working Groups.



*Wiltshire Council funds drainage improvement and flood alleviation schemes to help reduce the flood risk for local communities.*

Some flood alleviation schemes could potentially deliver benefits across the Council's wide range of responsibilities. A combination of revenue, capital and additional funding could make it possible to develop schemes for flood risk management that could deliver a multiple range of benefits. An example of this would be SuDs, which not only perform a means of attenuating water flow, but can also enhance biodiversity for flora and fauna, and provide recreational facilities.

Funds accrued through the application of planning obligations and Community Infrastructure Levy (CIL) could provide a source of funding for drainage improvement and flood alleviation schemes.

### **Private Funding**

There is a potential for private funding of schemes where a private individual or company would benefit the most from a proposed measure, such as their land being better protected. Companies or individuals could contribute to flood risk management measures, but any funding they provide would probably have to be seen to be providing a clear commercial benefit to themselves. Sponsorship currently provides little funding support, but where there is a good business case this could be an effective method of securing financial support.

Private sector partnerships and initiatives could be formed to promote specific schemes, but are unlikely to be viable in most cases because of the potentially high start up costs, and because private companies generally want to see a return in their investment in the short to medium term. The timing and management of these schemes would need to be carefully considered.

Developer contributions, LEP and other funding associated with development has potential to provide funding for flood risk reduction works, especially in those areas where significant development is proposed.

### **Charitable Trusts & non Government Organisations**

Grants from charitable trusts and non government organisations are a potential source of funding particularly for schemes that are relatively small and localised. There are many trusts that exist to support wildlife, communities, poverty, education etc. and if a scheme can show benefits there is no reason why applications cannot be made to support new schemes in appropriate cases.

### **Community Fundraising**

Although it can be a time consuming way of raising small amounts of money, community fundraising is a good way of raising community engagement and spirit, and can assist in helping a scheme apply for additional funding. It may be a relevant way of raising funds for specific schemes in some cases.

## City, Town and Parish Councils



*Working with local communities and landowners can reduce costs and help implement schemes as at Winterslow.*

Local funding may be available for particular schemes, where they have a wider community benefit. The emphasis is likely to be on community involvement and volunteering, and local voluntary groups should consider this option if they have a suitable scheme. However the Community Infrastructure Levy (CIL) could provide a funding source in the future.

Local community involvement can help in obtaining agreements from landowners, and help implement schemes, which has proved helpful in the past. City, town and parish councils are also able to raise funding through Council Tax parish precepts.

### **Other funding sources**

Public appeals, Lottery, European Union and Defra grants and pilots are other ways of accessing money, each of them requiring specific criteria for qualification and awareness of them should be taken into account when considering raising funds for a scheme. Before preparing bids it will be necessary to ensure there are sufficient resources to prepare the bid and a reasonable chance of success.

### **Non- Financial Contributions**

In some cases contributions can be made in other ways, for example by others providing land, material or even volunteer labour. This can be an effective way of getting work done at minimum cost, and has proved effective when landowners have been keen to see schemes implemented.

## **7. Governance**

### **Wiltshire Council**

Wiltshire Council as LLFA will continue to endeavour to make the best use of its resources and provide value for money with regard to flood risk management and the responsibilities and duties of the legislation are conducted openly, honestly and are accountable.

Wiltshire Council cannot deliver the objectives of the local strategy without the assistance of others. The Council needs to work with other Risk Management Authorities, Flood Risk Management Stakeholders, community groups and the public.

Wiltshire Council has an established Flood Risk Management Governance Structure, with the overall governance of flood risk management regularly reviewed by the Council's Environmental Select Committee.

### **Strategic Flood Risk Management Group**

The Council's Strategic Flood Risk Management Group is chaired by a Cabinet member portfolio holder, who works closely with the Chairs of the Operational Flood Working Groups.

Members of the Strategic Flood Risk Management Group include:-

- The Portfolio Holder for Flooding – Councillor Seed,
- Chairs of Operational Flood Working Groups – Councillors Jacobs and Hewitt,
- Wiltshire Council's Corporate Directors, Carlton Brand and Maggie Rae
- Wiltshire Council's Associate Directors for Economic Development and Planning, and Highways and Transport,
- Environment Agency,
- Wessex Water,
- Wiltshire Council's Emergency Planning and Drainage teams,
- Highways Agency and Network Rail,

The Strategic Group usually meets annually, and oversees the work of the Operational Flood Working Groups, which generally meet every two months. The Strategic Group sets and reviews the strategy with regard to flood risk managements, and monitors delivery of the Council's strategies and duties.

### **Operational Flood Working Groups**

There are three Operational Flood Working Groups, which cover the north and south of the county, based broadly on river catchment areas, with a separate group for Salisbury. The meetings usually take place every two months, and are attended by representatives from the EA, Wessex Water, Thames Water, Highways Agency, Wiltshire Fire and Rescue, Canal and Waterways Trust and other organisations having an interest in flooding and drainage matters. Town and parish councils are invited to contribute to the meetings in connection with issues in their areas.

Following consideration of specific flooding issues at the Operational Flood Working Groups, the Council has undertaken a number of joint schemes with the EA, Wessex Water and Thames Water, and town and parish councils. These have demonstrated the value of partnership working, which is needed to tackle these often complex issues. Project teams have been formed to deliver specific studies, flood alleviation schemes, or individual property protection projects.

There are other Council departments and services that have a role in aspects of local flood risk management, including spatial and emergency planning, and there is an open invitation for them and other stakeholders to attend the flood working groups as appropriate.

### **Delivery**

The delivery of the Council's flood risk management service depends to a large extent on the Council's Drainage Team, which forms part of the Highways Asset Management and Commissioning Team in Highways and Transport. The team with a staff of five, which is being increased to eight, works closely with other Council teams having an interest in drainage and flooding issues, and deals with the current and future proposed programme of drainage and flood alleviation works within the County.

The team works closely with the Operational Flood Working Groups and supports the operation of the groups. The drainage team is supported by Atkins, the Council's Highway Consultant, who can provide specialist technical advice on a wide range of drainage aspects, and Balfour Beatty Living Places, who are the Council's main contractor for drainage works. Performance of the contractors and their supply chains are monitored through the contract management processes set up to manage the Wiltshire Highways and Streetscene Contract, which are reported annually.

### **Monitoring and Reviewing**

The LFRMS will remain a live document and will be reviewed as required by the Strategic Flood Risk Management Group. Changes may need to be made to the strategy, which could be as a result of:-

- Significant flood events that affect the Council's prioritisation of works.
- Important changes to available information used to assess flood risk
- Policy changes affecting the roles and responsibilities of Wiltshire as a LLFA
- The monitoring identifying that the Local Strategy is not achieving its objectives

### **Resource to Deliver the Strategy**

Resources are needed for the management and activities of the LLFA. As a unitary authority Wiltshire Council has been able to integrate many of the functions and activities into the existing structure within the Highways Asset Management, Local, Spatial Planning and Emergency Planning teams.

The introduction of a SuDs Approval Body in accordance with the Flood and Water Management Act 2010 may require additional resources to meet these requirements when that part of the legislation is enacted. In the longer term the maintenance of the sustainable drainage installations will have a need for resources, and the funding for this is uncertain at present.

The resource requirements will continue to be reviewed by the Strategic Flood Risk Management Group, and taken into account in the Council's budget setting process.



## APPENDIX 1 – Environmental Considerations

Factor	Considerations
Population	The need to manage flood risk for the benefit of the increasing and ageing population in Wiltshire. The necessary residential development required to house the growing population needs to be delivered in locations, and using techniques, that are sustainable and protect and enhance the qualities that contribute to high levels of resident satisfaction.
Health	Protection from hazards associated with flooding. People's mental and physical health can be affected by the perceived risk of flooding and contaminated flood water. There is the potential to better manage risks to reduce these effects. There may be opportunities to improve public access to recreational features, goods and public services that could make a material difference to their health and quality of life.
Economy	There is a need to manage flood risk to critical infrastructure and material assets so that the infrastructure required for economic prosperity continues to function. There is the potential for flooding to disrupt critical transport infrastructure such as rail and road networks which could have considerable implications to the economy. Changes in the frequency and extent of flooding leading to consequent changes in the use of land, could affect its versatility or productivity.
Biodiversity	Changes in flood risk, frequency or changes in water levels that have the potential to adversely affect nature conservation, biodiversity and landscape features through habitat loss or fragmentation. Alternatively, such changes may present opportunities to improve the condition of existing habitats or create new biodiversity and landscape features.
Water Environment	Groundwater reserves are important for private and public water supplies. Construction, changes in flood risk to areas of potentially contaminated land and changes in flood frequency associated could lead to changes in overground and underground water bodies. Such changes may affect a water body's ability to achieve and maintain good chemical and ecological status.
Geology and Soils	The relationship between the geology of an area and overlying soils is a significant factor in determining flood risk. Flooding could result in changes in the use of land, affecting its versatility and productivity. However, Grade One agricultural land at risk of flooding is often no coincidence, as the flooding of land with nutrient-rich sediment creates fertile soil. It is important to maintain access to the best and most productive agricultural land for economic and social benefit. Aquifers are important sources of water supply, and can be adversely affected by development unless appropriate controls are implemented.

<b>Factor</b>	<b>Considerations</b>
Landscape and Townscape	Changes in water levels or land use have the potential to adversely affect landscape features. However, such changes may present opportunities to create new and interesting landscape features.
Historic Environment	Changes or alterations to flooding regimes that can adversely affect historic environment sites and their settings. Schemes may also manage the flood risk to heritage features or lead to improved access to historic environment sites.
Air Quality	The construction activity of physical flood risk alleviation schemes could increase emission levels of atmospheric pollutants locally, but these would be short duration effects. Flood risk alleviation schemes themselves are unlikely to have any effect on air quality.
Transport	Flooding has the potential to disrupt critical transport infrastructure (such as road or rail networks).The location of such infrastructure may influence the range of available flood risk management options.
Waste	Flooding has the potential to adversely affect waste treatment and related sites. The construction of physical flood risk alleviation schemes have the potential to produce waste which should be minimised through efficient design and management of waste products.

## Appendix 2 - Additional Flood Risk Management Stakeholders

Stakeholder	LRFM Role	Method of Engagement
Area Boards	Represent town and parish councils as a group to the county council	Area Board meetings, advice and information as required.
Association of British Insurers (ABI)	Represent the insurance industry and work with government, regulation & policy makers	Advice and comments where necessary.
Canal & River Trust	Ownership and maintenance of waterways in England & Wales as well as associated assets	Invitation to OFWG and consultation on schemes.
DEFRA	Department for Rural Affairs and responsible for setting policy for FRM	Consultation and enquiry
English Heritage	Government advisor on historic places and heritage	Consultation and enquiry as required
Highways Agency	Responsible for M4/A303 & A419 through Wiltshire	Invite to OFWG and consultation where necessary
Housing Associations	Social housing accommodation providers	Providing and sharing information on vulnerable properties and advice
Land owners/estates	Maintenance of flow of water as riparian owners	Consultation with regard to flow or access to land for schemes
Local Government Association (LGA)	Lobbying and support of local authorities	Sharing best practice
Met Office	Provision of weather alerts and flood guidance statements	Liaison through LRF and Emergency response team
National Farmers Union	Represents farmers at local and national level	Consultation as required
Natural England	Advisor the government on safeguarding England's natural environment	Consultation as required
National Flood Forum	Support and advice to communities and individuals	Consultation as required, attendance at flood seminars
Neighbouring authorities	LRFM authorities and sharing on information on river catchments	Consultation as required
Network Rail	Responsible for rail network which includes assets such as culverts and bridges	Standing invite to OFWG meetings. Consult on schemes as required
Regional Flood & Coastal Committee's	Bring together LRFM authorities, administer local levy for flood defence schemes	Applications for funding, consult as necessary
Town and Parish Councils	Source of local knowledge and consultees in planning process	Standing invite to OFWG meetings. Consultation as required
Universities	Develop and assist with knowledge and projects	As required
Utility companies	Other than water companies, assist in flood alleviation work to protect assets	Consultation as required.

## Appendix 3 – Resources to Deliver Strategy

Activity	Resource/Team
Develop, deliver, apply and monitor the local strategy	Strategic Management Group/Highways Asset Management Team
Management and partnership working	Operational Flood Working Groups/Highways Asset Management Team
Commenting on planning applications and interaction with spatial planning	Operational Flood Working Groups/Drainage Engineers/Spatial Planning teams
Studies and management of studies to understand flood risk and deliver schemes	Drainage Team/Atkins and other consultants for Wiltshire Council as required
Community awareness and engagement with the public	Drainage Team/ Local Highways and Streetscene Team
Investigating flooding incidents	Drainage Team/ Operational Flood Working Groups
Developing a maintenance programme and schedule for assets	Highways Asset Management Team, Local Highways Team
Designating features or structures	Drainage and Structures Teams in Highways Asset Management
Consenting and enforcing works for Ordinary Watercourses	Drainage Team
SUDS Approval Body	To be confirmed when legislation introduced.

## Appendix 4

### Wiltshire Medium Term Plan

Scheme	Background	Proposal	Financial Information
Aldbourne	The community of Aldbourne has experienced flooding from groundwater and the sewerage system a number of times in the last 20-years. Surface water flooding of the highways is also a frequent occurrence. 10 residential properties have been reported as being affected by the flooding, of which approximately 5 experienced internal flooding. As a result of these flood events the local community have formed a Drainage Improvement Group (DIG) to establish the causes of the sewer and groundwater flooding in the village, and identify and implement the range of solutions which could address it. The EA flood maps indicate that 172 residential properties are at risk from surface water flooding (30-year deep), and 33 residential properties from fluvial flooding (Flood Zone 3).	This project has been developed in consultation with the Environment Agency and has received funding for a desk top study and works with Lottage Road and Goddards Lane to upgrade the culvert. Thames Water has a program of sewer lining and sealing of their apparatus, this is ongoing. Thames Water are currently proposing a scheme to separate the surface water and groundwater flows from the sewer network, thus reducing sewer flooding. This scheme will improve surface water drainage to help reduce the risk of property and sewer flooding. Funding is in place to enable the scheme to be implemented in 2014.	Scheme Cost £180,000 Estimated Discounted Benefits £600,000
Great Bedwyn	The village of Great Bedwyn suffers from frequent surface water flooding of residential property. Flood maps show 69 residential properties are at risk of surface water flooding during a 1 in 30 year rainfall event. Community assets are also at risk including a Doctors Surgery, Electricity Sub Station and Community Centre. Historical records show several instances of internal property flooding (notably in 2000, 2003, 2008 and 2012) in addition to flooding of gardens and recreational areas.	The works include a combination of attenuation features and drainage ditches to attenuate and divert surface water away from properties. The scheme will be designed to provide a 1 in 30 year standard of protection for 69 residential properties across the 3 areas at very significant risk of surface water flooding. The proposed works will seek to provide a sustainable solution providing environmental and community benefits in addition to reducing flood risk. A bid has been submitted for funding in 2015. Thames Water has a program of sewer lining and sealing of their apparatus as sewers become inundated and cause flooding to homes. We are working with Network Rail and Thames Water to minimise flooding risk.	Scheme Cost £475,000 Estimated Discounted Benefits £1,278,000
Tilshead	Tilshead has suffered flooding from the river Til. Surface water is conveyed downstream to the village of Tilshead through a combination of open valley bed, culverts and open channel. The extreme rainfall events in combination with very high ground water levels experienced in December 2013, January and February 2014 meant flows in the Til exceeded the capacity of the culverts and surface water sewer system causing public highway and property flooding. Based on surface water flood maps 55 properties are at risk of flooding in a 3.3% AEP event.	Construction of an upstream flood storage area to attenuate flow in order for the existing drainage system downstream to operate within the limitations of its capacity. This attenuation will aim to reduce risk flooding of infrastructure and properties. This lost cost, innovative scheme based solution will seek to reduce the risk of groundwater flooding but PLP may still be required to mitigate against groundwater flood risk. Assumed standards of protection (current and proposed) and construction costs are best estimates based on available data.	Scheme Cost £195,000 Estimated Discounted Benefits £1,856,417
Winterslow	The village of Middle Winterslow is susceptible to frequent surface water flooding. 13 residential properties suffer persistent flooding of front and back gardens preventing safe access and egress from properties; for many properties this flooding occurs several times a year and is on the threshold of causing internal flooding. Flood maps show properties are at risk of deep surface water flooding during a 1 in 30 year rainfall event, based on historic records and anecdotal evidence it is considered that the standard of protection (SoP) against internal flooding is currently 1 in 5 year. In 2008 the Environment	The proposed works for Stage 2 of this scheme include new overflow pipework within the highway to manage excess flow from the soakaways installed during Stage 1. The pipework will divert flows away from properties, taking flow under the highway with an outfall into a new infiltration trench behind 1 Witt Lane. It is considered that Stage 2 will increase the standard of protection to 1 in 50 years for 13 properties. Scheme implementation will be programmed when funding source is confirmed.	Scheme Cost £80,000 Estimated Discounted Benefits £1,856,417

Scheme	Background	Proposal	Financial Information
	Agency commissioned a study to investigate and propose a solution to the flooding problems in Middle Winterslow. Using the information provided by the 2008 study, Wiltshire Council have carried out £50,000 of Capital Works constructing Stage 1 of a scheme to manage surface water in the village.		
Orcheston	Orcheston has been flooded by the large volume of floodwater conveyed downstream from Tilshead. Surface water flooding occurs at the northern edge of the village from a tributary upstream of Rockery Farm. This is due to the low capacity of the shallow channel and the flat valley. Flooding in this part of the village mainly affects an access road to residences and gardens. Based on surface water flood maps 28 properties are at risk of flooding in a 3.3% AEP event. The village is also susceptible to groundwater flooding.	Construction of an upstream flood storage area to attenuate flow in order for the existing drainage system downstream to operate within the limitations of its capacity. This attenuation will aim to reduce risk flooding of infrastructure and properties. This lost cost, innovative scheme based solution will seek to reduce the risk of ground and surface water flooding but PLP may still be required to mitigate against groundwater flood risk. Scheme details are being developed to confirm standards of protection (current and proposed) and construction costs.	Scheme Cost £75,000 Estimated Discounted Benefits £945,085
Dilton Marsh	During severe downpours and after periods of persistent heavy rain, flooding affected properties between Petticoat Lane and Lansdowne Close at the village of Dilton Marsh. This is due to the culvert network capacity being exceeded and surcharged flow emanating from manhole chambers. Surface water collects in the rear gardens of no. 10 and 11 Lansdowne Close due to inadequate capacity of the surface water gulley's in the gardens and driveways at these properties. Surface water flood maps show 16 properties are at risk of flooding in a 3.3% AEP event.	Replacement part of the existing surface water drainage network is proposed. The preferred option is being discussed with landowners to enable the early implementation of this scheme, which will be funded by Wiltshire Council. Implementation is anticipated in 2014.	Scheme Cost £123,000 Estimated Discounted Benefits £269,174
Chitterne	Chitterne has been subject to flooding from the Chitterne Brook, a winterbourne. During recent storm events (December 2013 - February 2014) runoff from the upland catchment exceeded the capacity of the Chitterne Brook and structures inundating roads and causing property flooding. Surface water flood maps show 40 properties are at risk of flooding in a 3.3% AEP event. Flooding from groundwater sources is also an issue in Chitterne.	Construction of an upstream flood storage area to attenuate flow so the existing drainage system operates within the limitations of its capacity. This attenuation will aim to reduce risk flooding of infrastructure and properties. This lost cost, innovative scheme based solution will seek to reduce the risk of groundwater flooding but PLP may still be required to mitigate against groundwater flood risk. Scheme details are being developed to confirm standards of protection (current and proposed) and construction costs. Additional works to be carried out in water meadows to improve conveyance	Scheme Cost £135,000 Estimated Discounted Benefits £1,350,122
Forest Road, Melksham	Residential properties and the main access route along Forest Road have been subject to regular surface water flooding due to the insufficient capacity of the drainage network; as a result over 20 residential properties are at risk of flooding in the Forest Road area. Drainage investigation and repairs have been undertaken in 2007 and 2012; these confirmed that one of the key issues is the reduction in pipe diameter from 375mm to 300mm, which limits the flow capacity of the network, resulting in flooding. In addition, during the last investigation in 2012 it was evident that the entire pipe length had deteriorated in condition since 2007, thus increasing the risk of collapse or blockage in the near future.	The proposed works are to construct a new 1250mm diameter pipe within the highway, upgrading the existing 375/300mm pipes and thus providing a significant increase in the piped networks capacity. The works include diverting the existing undersized network away from properties, garages and private gardens, instead routing the pipes along the highway. All lateral pipes will be constructed of porous piping to allow the ingress of groundwater into the system to limit flooding from this source. Scheme implementation will be programmed when funding source is confirmed.	Scheme Cost £153,000 Estimated Discounted Benefits £1,477,000

Scheme	Background	Proposal	Financial Information
Other schemes	Following the extensive flooding between December 2013 and March 2014 a number of communities in Wiltshire experienced flooding. Investigations are underway to establish the causes and extent of flooding, working with the local communities and Flood Wardens.	The Council has been working with the communities to encourage take up of flood support grants, and to identify maintenance and flood protection measures that the community can assist with. As investigations into previous flooding continue it is anticipated that further schemes will be identified for inclusion in the Medium Term Plan.	To be confirmed

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by textphone 01225 712500,  
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