

Local Flood Risk Management Strategy 2013-2016





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Foreword

Flooding can have a significant detrimental impact on the lives of residents and others. Homes can be ruined along with valuable possessions - potentially resulting in residents feeling constantly vulnerable in their own homes wondering when the next incident might take place. Traffic can be badly affected, bringing great inconvenience to road users and potential damage to vehicles and roads. Important recreational sites may be inaccessible to residents for long periods of time perhaps resulting in the disruption of normal family life.

Bracknell Forest Council (BFC) recognises that flooding is an important matter for residents, businesses and road users. Therefore, it fully intends to respond positively to recent government legislation which has provided local authorities with a number of new responsibilities in relation to flood risk management.

This strategy explains what is being done to manage 'local flood risk'. It provides information about the forms of flooding and the organisations involved. It explains the roles and responsibilities of the major organisations involved in flood risk. It also highlights and summarises the information available on flooding in the Borough so that it is more easily accessible and therefore can be used more effectively.

The primary focus of this strategy is local flooding. To members of the public suffering from flooding its cause is irrelevant, but each source of flooding may have a number of different organisations responsible for it. This strategy seeks to clarify how organisations will work together and establish objectives set for the next three years. These objectives will be achieved dependant upon information that is available, where the risk is greatest and in relation to what funding can be attained.

Assessing levels of risk from flooding is a difficult task. We propose to take a pragmatic approach to flood risk and ensure we do nothing to make it worse and where possible take steps to reduce the impact in the future. In working with others, the council will also utilise its own assets such as highways, parks and countryside and amenity land to optimise their use in reducing the impact of flooding. Our sustainable planning policies and highway network management and design will also ensure new developments take full account of flooding risks.

Extreme weather events which cause flooding are clearly not something that can be controlled and the objectives identified in this strategy seek to manage flood risk, since it cannot be removed entirely.

This strategy is a statement of intent as to what the council as a whole is working towards to manage flood risk within the Borough, and its implementation is intended to be of tangible benefit to local residents and businesses and to those passing through our borough.

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1 Introduction and objectives

1.1 The purpose of this strategy

The Government has recently given Local Authorities new powers to help manage flood risk in a more coordinated way. The new responsibilities relate to local flood risk, namely from surface water, groundwater and ordinary watercourses (smaller rivers, streams and ditches). Flood risk from all other rivers (known as main rivers) remains the responsibility of the Environment Agency.

The Local Flood Risk Management Strategy (LRMS) for Bracknell Forest aims to increase awareness of local flood risk issues. It sets out how partners are working together to reduce flood risk.

Bracknell Forest Borough is assessed as being at a low risk of flooding. Where flooding has been experienced it has been of a short duration in relation to intense rainfall. However communities do not always distinguish between different types of flood risk, as the impact is their key concern. We cannot stop flooding. Extreme weather events are on the increase and our intention is that the impact of flood incidents is as minimal as possible.

This strategy starts with an overview of the legislation that underpins flood risk management. It is followed by Chapter 2 which provides clarification on roles and responsibilities of the organisations involved in flood risk management. Chapter 3 provides a summary of flood risk within the Borough, including a review of information that already exists. Chapter 4 provides information on options and funding mechanisms and details our objectives and measures for managing flood risk. The strategy is supported by a number of annexes which detail how we will manage our duties under the legislation. These are held separately in annexes so they can be updated independently of the strategy should the need arise.

1.2 How the Local Flood Risk Management Strategy (LRMS) has been produced

The process for developing the Local Strategy has been produced in a number of stages which are identified below.

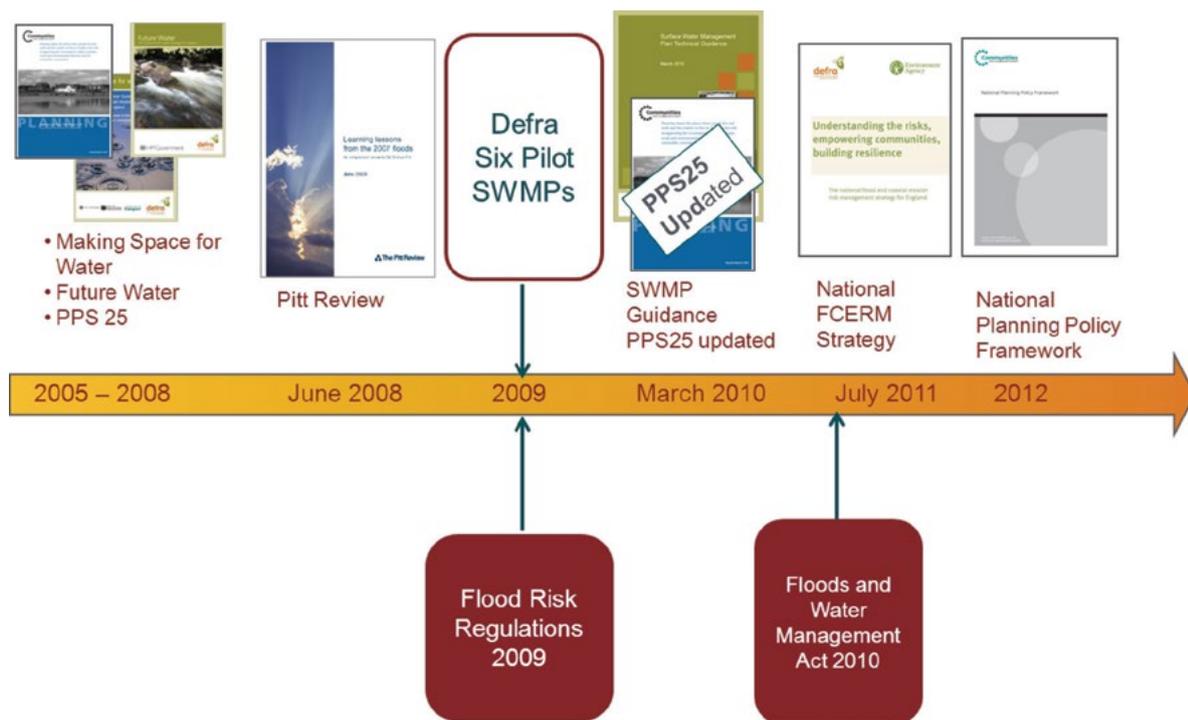


1.3 Background to the Flood and Water Management Act (FWMA) (2010)

Within the last 30 years the responsibility for flood risk management within England has changed considerably. In terms of flood risk management the most relevant legislation was the Land Drainage Act 1991 which outlined the duties and powers to manage land drainage for a number of bodies including Local Authorities, and the Water Resources Act 1991, which outlined the role and responsibility of the National Rivers Authority (later to become the Environment Agency).

Flood risk management policy changes were accelerated within England and Wales due to the major flooding events that occurred in 1998 and 2000. This led to the release of Planning Policy Guidance 25 (PPG25): Development and Flood Risk, the aim of which was to strengthen development planning with regard to flood risk. This was subsequently superseded by Planning Policy Statement 25 in 2006 which reinforced the requirement within PPG25 for sustainable surface water management in new developments in England and Wales. This has now been replaced by the National Planning Policy Framework (NPPF) which looks to rationalise the amount of planning legislation.

Figure 1.0: Flood risk legislation/policy



In 2009 the Flood Risk Regulations came into force which transposed the EU Flood Directive into UK legislation for England and Wales. The EU Flood Directive was implemented between 1998 and 2009.

The Pitt Review

Sir Michael Pitt carried out an independent review of national flood risk management practices after the widespread floods during the summer of 2007 in which over 50,000 households were affected and damages exceeded £4 billion. The Pitt Review was published in June 2008 and called for urgent and fundamental changes to the way flood risk was being managed. The report contained 92 recommendations for the Government, Local Authorities, Local Resilience Forums and other stakeholders which were based around the concept of local authorities playing a major role in the management of local flood risk, through coordination with all relevant authorities.

Many of the recommendations within the Pitt review have now been implemented through the FWMA (2010), which places a great deal of responsibility on the upper tier local authorities which includes unitary authorities such as Bracknell Forest, especially under their role as LLFA. The role of the Environment Agency remains largely unchanged; however they now have the role of overseeing all sources of flooding.

The EU Floods Directive

The EU Flood Directive (2007/60/EC) for the assessment and management of flood risks came into force on 26 November 2007. This Directive requires Member States to assess if all watercourses and coast lines are at risk from flooding, to map the flood extent and assets at risk in these areas and to take adequate and coordinated measures to reduce this flood risk.

All Lead Local Flood Authorities have had to produce a Preliminary Flood Risk Assessment (PFRA) which involved collecting information on past and predicted future floods from surface water, groundwater and ordinary watercourses. Bracknell Forest Council (BFC) does not have areas of significant flood risk identified as part of this process.

The Flood & Water Management Act (2010)

Many of the recommendations contained within the Pitt Review were implemented within the Flood & Water Management Act (2010), which gained royal assent on the 8th April 2010 and provides legislation for the management of risks associated with flooding.

The Act reinforces the need to manage flooding holistically and in a sustainable manner. It also places a number of new roles and responsibilities on councils which are designated as LLFAs. The preparation of this Flood Risk Management Strategy is just one of the duties placed upon LLFAs.

The Act defines various bodies as 'risk management authorities' and lists them as the following:

- A Lead Local Flood Authority;
- The Environment Agency;
- A district council for an area for which there is no unitary authority;
- An internal drainage board;
- A water company; and
- A highway authority.

1.4 Relationship to other documents

There are a number of other documents of relevance and that may have bearing on the Local Strategy and these are identified below:

Table 1.0: How other plans and strategies fit into the Local Flooded Risk Management Strategy

Document	Description	What has the document been used for within the production of the Local Strategy?
National Planning Policy Framework (NPPF)	This is National Planning Policy in relation to the requirements for development and flood risk. The NPPF provides clearer guidance on how flood risk should be considered within the planning process.	The Strategy has been informed by the general principles of the NPPF.
Technical Note NPPF	This is the technical guidance in implementing the NPPF	The Strategy has used the technical guidance and information in the preparation of potential options for managing flood risk.
Bracknell Forest Core Strategy	The Local Authorities policy document in relation to planning and Bracknell's vision for development in the future. The Core Strategy for Bracknell was adopted in February 2008; this sets out the planning framework for Bracknell up to 2026. The Core Strategy makes up part of the Local Development Framework and sets up a number of Planning Policies to help guide development within the Borough.	The policies and information on regeneration and development proposals have been reviewed to ensure that there is no conflicts between the Local FRM Strategy and the Core Strategy
Bracknell Forest SFRA (Strategic Flood Risk Assessment)	An evidence base used to inform the Spatial Planning process. Bracknell SFRA was completed in August 2010 and is used as an evidence base to assess flood risk for spatial planning purposes and for individual flood risk assessments.	This document has been reviewed to understand the existing flood risk information for Bracknell.
Bracknell Forest PFRA (Preliminary Flood Risk Assessment)	This is a high level document required under the EU Floods Directive. This document covers local sources of flood risk and makes an assessment of the risk from these sources within Bracknell.	The information collected as part of this process has been used to provide baseline information.
National Flood and Coastal Erosion Risk Management Plan (FCERM)	This is the Overarching guidelines for flood risk management within the UK	The Local Strategy has been aligned with the National Strategy.
Catchment Flood Management Plan	Provides a catchment approach to managing Flood risk and provides key policies and actions on the catchment scale.	Used to provide background information and to ensure the policies within the Local Strategy align with the catchment policies identified for the catchment Bracknell sits within.
Thames River Basin Management Plan	Provides information on water quality and quantity within the borough and measures to improve them in line with the Water Framework Directive.	Used to understand the existing baseline and links to the requirements of the Sustainable Drainage Systems.

Catchment Flood Management Plan (CFMP)

CFMPs provide an overview of flood risk across a river catchment. They consider all types of flooding and consider the impacts of climate change. CFMPs have been produced by the Environment Agency and are to be used as a tool that informs the management of flood risk on a river catchment basis.

Bracknell Forest falls within the Thames CFMP Region Sub-area 7: Expanding town in floodplain locations for areas around the Upper and Middle Blackwater. It also falls within Sub-area 1: Towns and villages in open floodplain (north and west). This means there are two policy options for the two distinct types of areas within Bracknell Forest.

Policy option 4: Areas of low, moderate or high flood risk where we are already managing the flood risk effectively but where we may need to take further actions to keep pace with climate change.

Policy option 6: Areas of low to moderate flood risk where we will take action with others to store water or manage run-off in locations that provide overall flood risk reduction or environmental benefits.

National Flood and Coastal Erosion Risk Management Strategy for England and Wales

The FWMA 2010 requires the Environment Agency to develop, maintain, apply and monitor a strategy for flood and coastal erosion risk management in England.

The overall aim of the Strategy is to ensure the risk of flooding is properly managed by using the full range of options in a coordinated way. The government will work with individuals, communities and organisations to reduce the threat of flooding by:

- Understanding the risks of flooding, working together to put in place long-term plans to manage these risks and making sure that other plans take account of them;
- Avoiding inappropriate development in areas of flood risk and being careful to manage land elsewhere to avoid increasing risks;
- Building, maintaining and improving flood management infrastructure and systems to reduce the likelihood of harm to people and damage to the economy, environment and society;
- Increasing public awareness of the risk that remains and engaging with people at risk to make their property more resilient; and
- Improving the detection, forecasting and issue warnings of flooding, planning for and co-ordinating a rapid response to flood emergencies and promoting faster recovery from flooding.

The FWMA states that Local Strategies must be consistent with the National Strategy. Being consistent with the National Strategy means acting in accordance with the overall aims and objectives, and in particular with the following six 'guiding principles':

- Community focus and partnership working;
- A catchment 'cell' approach;
- Sustainability;
- Proportionate, risk-based approached;
- Multiple benefits; and

- Beneficiaries should be allowed and encouraged to invest in local risk management.

There is an aspiration that public authorities cooperate to manage flood risks.

River Basin Management Plan

Bracknell lies within the Thames River Basin. The Thames River Basin Management Plan is about the pressures facing the water environment in this river basin district, and the actions that will address them.

It has been prepared in consultation with a wide range of organisations and individuals and is the first of a series of six-year planning cycles. There are a number of main river watercourses that are within the borough (as seen in Annex A, figure A.1). The European Water Framework Directive came into force in December 2000. It gives an opportunity to plan for and deliver a better water environment, focussing on ecology and protecting and enhancing water quality.

The table below provides a summary of the quality information for these watercourses. The information below is taken from survey reports completed by the Environment Agency which provide information on water quality and measures to improve it in line with the Water Framework Directive.

Table 1.1: Water body existing status

Water body	Chemical quality	Ecological quality	Hydromorphological status	Overall Risk
Bull Brook	Does not require assessment	Moderate Potential	Heavily Modified	At risk
Cut (Ascot to Bull Brook confluence at Warfield)	Does not require assessment	Moderate Potential	Heavily Modified	At risk
Cut at west Bracknell	Does not require assessment	Moderate Potential	Heavily Modified	At risk
Cut (Binfield to River Thames confluence) and Maidenhead Ditch	Good	Poor Potential	Heavily Modified	At risk

Within the River Basin Management Plan (RBMP) there are a number of measures that are currently now in place that can improve the status of the watercourse. The Cut and Bull Brook are classified as a heavily modified water bodies and the mitigation measures are focused around:

- Attenuate flows to limit detrimental effects of the features within the water body (drainage);
- Improvements and retention of marginal aquatic vegetation;
- Removal of obsolete structures and;
- Improve the in-channel morphology.

1.5 What is flooding and flood risk?

What is a Flood? The FWMA identifies a flood as:

'including any case where land not normally covered by water becomes covered by water.'
It does not matter whether the flood is caused by:

- heavy rainfall
- a river overflowing its banks being breached
- a dam overflowing or being breached
- tidal waters
- groundwater

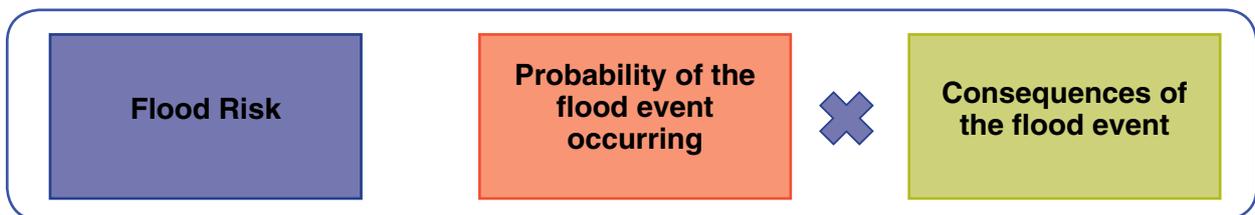
a flood does not include:

- A flood from any part of a sewerage system, unless wholly or partly caused by an increase in the volume of rainwater entering or otherwise affecting the system or
- A flood caused by a burst water main

The European Union (EU) Floods Directive defines a flood as a covering by water of land not normally covered by water. Flooding can occur relatively quickly and these are often referred to as flash floods, others can develop over a longer period of time. Floods can also recede at different rates and can be limited to local areas or be spread over whole river valleys. Although flooding can occur in unwanted areas, some areas such as balancing ponds that can be wet or dry are designed to flood in times of high flows.

Flood risk is the combination of flooding probability and the potential adverse consequences of the flood event (in relation to human health, the environment, cultural heritage and economy). The probability or likelihood of flooding is described as the chance that a location will flood in any one year. If a location has a 1.3% chance of flooding each year, this can also be expressed as having a 1 in 75 chance of flooding in that location in any year.

This does not mean that if a location floods one year, it will definitely not flood again for the next 74 years.



Flooding is a natural phenomenon, the effects of which can be made worse by poor management of the environment and landscape. The effects of flooding in the future may also be made more severe due to the impact of climate change, especially if nothing is done in relation to the risks.

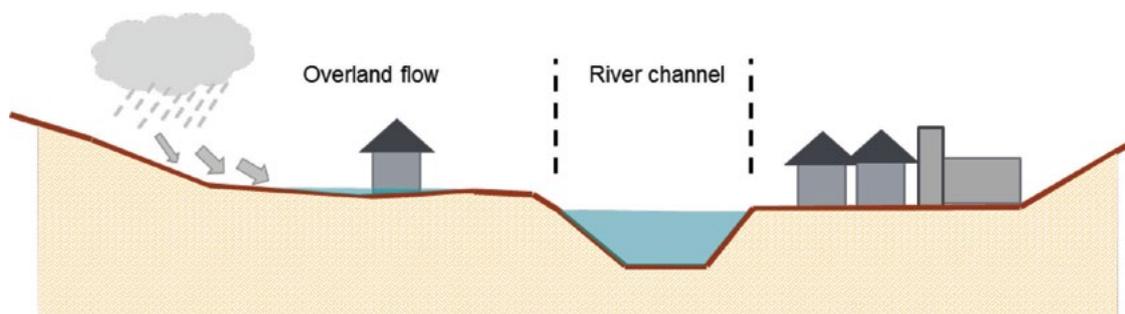
Factors that contribute to flooding can be meteorological in nature such as rainfall, hydrological such as groundwater level or human factors including occupation of the floodplain, changes in land use activities and structural flood control measures.

Rainfall and the consequential flooding are largely unpredictable in location and severity, and dealing with these uncertainties will be challenging. This is the type of flooding that Bracknell is most familiar with.

Surface water flooding

Surface water flooding is a form of local flood risk, and is also known as pluvial flooding or flash flooding. This type of flooding occurs when rainfall generates runoff which flows over the surface of the ground and accumulates in low lying areas. It is usually associated with high intensity rainfall events and can be exacerbated when the ground is saturated or when the drainage network has insufficient capacity to cope with the additional flow.

It is very difficult to predict this type of flooding. It may affect a widespread area and the extent of the flooding is relevant to the duration and intensity of rainfall, most of it is short-lived hence the description of flash flooding.



Sewer flooding

Sewer flooding occurs when the sewer network cannot cope with the volume of water that is entering it. It is often experienced during times of heavy rainfall when large amounts of surface water overwhelm the sewer network causing flooding.

Surface water flooding is normally caused when the capacity is exceeded and the system surcharges causing water to flow out of the manhole and drain covers. A surface water sewer can also fail as a result of a blockage, siltation, collapse and equipment or operational failure.

Highway flooding

Highway flooding can be defined as flooding caused by heavy rainfall resulting in overflows from drains, gullies and manholes leading to ponding in low spots on the highway network. Overflows could also be due to localised blockages, siltation, collapse and equipment or operational failure.

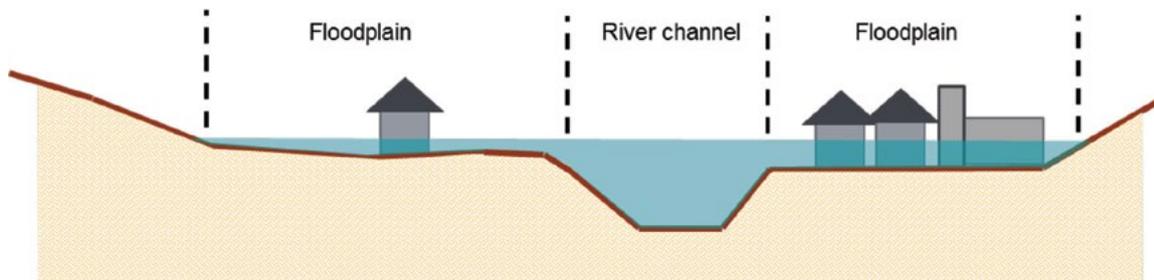
Groundwater flooding

Groundwater flooding occurs when water levels in the ground rise above the ground surface. Flooding of this type tends to occur after long periods of sustained heavy rainfall and can last for weeks or even months. The areas at most risk are often low-lying areas where the water table is more likely to be at a shallow depth and flooding can be experienced through water rising up from the underlying aquifer or from water flowing from springs. Ground water flooding occurs in areas which have highly permeable geology such as chalk.

River flooding

River flooding is known as fluvial flooding. Flooding from a river occurs when the capacity of the channel is exceeded and the water spills onto the floodplain.

The main rivers within Bracknell are The Cut located along the northern boundary of the Borough and the Blackwater along the southern boundary.



Ordinary watercourse flooding

Ordinary watercourse flooding concerns flooding from any watercourse which is not designated as a main river. All smaller watercourses, ditches and streams are classified as ordinary watercourses. Flooding from an ordinary watercourse occurs when the channel cannot accommodate the volume of water that is flowing in it, or when there is significant impedance to the passage of flow within the channel of the watercourse to the extent that it causes flow to come out of banks. Ordinary watercourses not designated as main rivers are the Bull Brook running from Martins Heron to The Cut.

Reservoir flooding

Reservoir flooding occurs when there is a complete or partial failure of the reservoir structure. It may be caused by erosion due to seepage, overtopping of the dam beyond its design level or through accidental damage.

There are three reservoirs located within Bracknell; Mill Pond, Fish Place (Ascot) and Sandhurst Lower Lake.

Interaction between different sources of flooding

Whilst the primary focus of this strategy is local flooding (surface, small watercourses) flooding in the Borough can arise from a number of combined sources. To members of the public suffering from flooding the source of water may seem irrelevant however each flooding source may have a number of different organisations responsible for dealing with it.

1.6 Bracknell Forest Borough Council objectives

This section sets out the primary principles and objectives which will be taken forward in order to ensure that local flood risk is considered, taken forward and managed effectively. The objectives need to be locally relevant and have been considered following a number of internal workshops including external stakeholders. Recognising the resources we have available and other priorities.

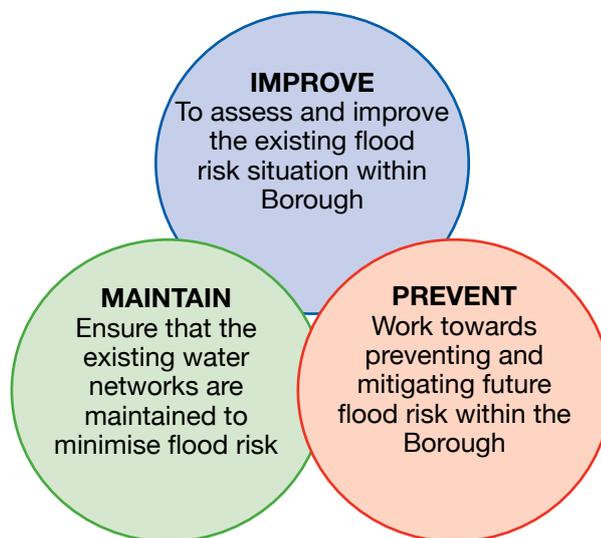
We propose to take a pragmatic approach to reduce the current flood risk and ensure that we do nothing to make this worse in the future. In formulating these objectives and measures we considered three options for flood risk management:

Maintain – Ensure existing water networks are maintained to minimise flood risk. Maintain so as not to worsen the situation.

Improve – Assess and improve the existing flood risk situation within the Borough. Seek to better understand the flood risk and drainage characteristics of the Borough.

Prevent – Work towards preventing and mitigating future flood risk within the Borough. Ensure there is no net increase in flood risk by considering the impact of new development, land use changes and climate change.

Figure 1.2: Overarching principles



The measures are those that we will seek to implement in order to meet the objectives of the Local Strategy. Each of the objectives has been considered in turn with measures identified to meet these objectives. These measures are explained within Table 4.2

Table 1.2: Local Flood Risk Management Strategy (LRMS) objectives

Objective		Contributes to overarching principle
1	Seek to reduce the current flood risk and ensure that as the LLFA we do not increase this in the future.	IMPROVE MAINTAIN PREVENT
2	Deliver a Local Flood Risk Management Strategy (LRMS) in line with the national flood risk management guidance.	IMPROVE MAINTAIN PREVENT
3	Deliver the LLFA duties and responsibilities under the FWMA	IMPROVE MAINTAIN PREVENT
4	Understand and capture flooding and drainage data of the Borough.	IMPROVE
5	Improve the level of understanding of flood risk, within the community as well as with key agencies. Ensure understanding of roles and responsibilities and adopt partnership working to deliver realistic outcomes.	IMPROVE
6	Ensure that due consideration is given to the wider environmental, social benefits and climate change requirements in both the strategy and delivery of objectives and measures.	MAINTAIN
7	Seek to avoid an increase in flood risk as a result of new development by controlling how any additional water enters existing drainage systems.	PREVENT
8	Currently Bracknell Forest Council (BFC) has not identified any schemes, however as opportunities arise for grant funding consider whether any potential schemes may be able to benefit.	IMPROVE MAINTAIN PREVENT
9	Identify and deliver appropriate opportunities for training and education in flood risk management.	IMPROVE MAINTAIN PREVENT



2 Roles and responsibilities

2.1 Why define roles and responsibilities?

One of the direct actions resulting from the Pitt Review of the summer 2007 flooding was that the role of the local authorities should be enhanced so that they take on responsibility for leading the coordination of flood risk management in their areas. Bracknell Forest Council (BFC) has been designated as the Lead Local Flood Authority (LLFA) and is responsible for leading local flood risk management across the Borough.

2.2 Risk Management Authorities within Bracknell Forest

The Flood and Water Management Act (FWMA) defines risk management as the following:

What is Risk Management?

Means anything done for the purpose of -

- 1) analysing a risk;
- 2) assessing a risk;
- 3) reducing a risk;
- 4) reducing a component in the assessment of a risk;
- 5) altering the balance of factors combined in assessing a risk, or
- 6) otherwise taking action in respect of a risk or a factor relevant to the assessment of a risk (including action for the purpose of flood defence).

The following organisations are identified as being 'Risk Management Authorities (RMAs) within Bracknell.

Lead Local Flood Authority	- Bracknell Forest Council (BFC)
Environment Agency	
District Council	- Not relevant as Bracknell is a Unitary
Internal drainage board	- there are no internal Drainage Boards within Bracknell
Water Company	- Thames Water
Highway Authority	- Bracknell Forest Council (BFC) are the Highway Authority

Figure 2.0: Flood risk partners



Under the provisions of the FWMA, the following duties are common to all risk management authorities:

- A duty to cooperate with other risk management authorities;
- A duty to act consistently in accordance to the national and local strategies;
- Powers to take on flood risk functions from another risk management authority, and
- A duty to contribute towards the achievement of sustainable development.

More detailed information on the specific roles and responsibilities of each organisation is also included in this chapter.

Lead Local Flood Authority (LLFA)

Bracknell Forest Borough Council is the Lead Local Flood Authority. In conjunction with leading and co-ordinating flood risk management activities, the FWMA also places a number of key duties on the LLFA. These duties are identified within the table below, more detailed information on implementation is provided within the relevant annexes.

Responsibility	Details
Local Strategy	To develop, maintain and monitoring of a Local Strategy in line with the National Strategy.
Duty to Investigate Flood Incidents	<p>To build an accurate image of the flood risk issues across Bracknell will require the collation of useful records from actual flood incidents when they occur.</p> <p>The investigations will examine which authorities have an involvement in a flood incident, and a report should outline their responsibilities or actions, if any. Investigations will involve consultation with the relevant risk management authorities, landowners and private organisations involved.</p> <p>The aim is for the Flood Investigation Reports to provide an understanding of the situations, outlining possible causes of flooding and potential long-term solutions. Further recommendations will also be made to highlight potential flood risk management actions. Reports will provide a clear and thorough understanding of the flooding situations, but BFC's duty to investigate does not guarantee that problems will be resolved and cannot force other authorities into action.</p>
Preparation of an Asset Register	<p>The LLFA have a duty to maintain a register of structures or features which are considered to have an effect on flood risk, including details on ownership and condition as a minimum.</p> <p>BFC is required to ensure there are records of all significant assets available for use by risk management authorities and for inspection by the public at all reasonable times. It is anticipated that this will take many years before this register is sufficiently comprehensive to be of real value in terms of flood risk management. Steps are underway to undertake and develop this register within the unitary authority and to link up existing registers held by other authorities.</p> <p>Unlike major assets associated with fluvial or tidal flooding or coastal erosion, there has often been much confusion over the ownership and maintenance responsibility of local flood risk assets. This is likely to be due to local drainage infrastructure commonly being hidden underground or along land boundaries, where landowners either do not realise or acknowledge that they have any responsibility. The Asset Register is a way to address this problem and ensure that residents are aware of assets in their area and have information to enable them to contact the assets' owners when there are issues.</p> <p>There are currently no set criteria for what defines an asset as significant but the most important consideration is its location. Future flood risk mapping and the flood history at a site will be used to analyse the 'significance' of each flood risk asset. The vulnerability of the asset's surroundings will also be used to determine the consequences of its failure.</p> <p>New Sustainable Drainage Assets will be recorded via the SuDS approval process and asset data may also be captured through local studies, such as Surface Water Management Plans and Flood Investigation Reports.</p>

<p>Designation of Features</p>	<p>BFC and the Environment Agency are both designating authorities' which means that these authorities may 'designate' features or structures where the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The designating authority has established that the existence or location of the structure or feature effects flood risk. • The designated authority has flood or risk management functions in respect of the risk which is affected. • The structure or feature is not designated by another authority. • The owner of the structure or feature is not a designating authority. <p>An example of such a structure or feature might be a privately owned balancing pond or river bank. If an asset becomes 'designated' its owner cannot alter or remove it without first consulting the designating risk management authority. The aim of designating flood risk assets is to safeguard them against unchecked works which could increase flood risk in the area. Designating of features or structures will be done only when there are concerns about the asset.</p>
<p>Consenting works to ordinary watercourses</p>	<p>The LLFA is responsible for consenting works, by third parties on ordinary watercourses within their boundary. Works are covered by the requirements of Section 23 of the Land Drainage Act 1991.</p>
<p>SuDS Approval Body</p>	<p>A duty to establish a Sustainable Drainage Systems (SuDS) Approving Body (SAB) with responsibility for approval of all drainage plans and the adoption and maintenance of SuDS that serve more than one property in new developments.</p> <p>In future all construction and development works which have a drainage implication must be approved by the SAB. Applications will be either submitted to the approving body as free-standing applications or combined with an application for planning permission (either outline or full). The SuDS approval process is designed to be separate from the current planning system; however, the two bodies will liaise and advise each other of their respective decisions.</p> <p>The SAB must review and assess the applications in line with the new National Standards (due to be published in October 2013) for sustainable drainage and either grant or refuse consent (this will be a delegated technical officer function similar to the application process undertaken by Building Control). A number of stakeholders will be consulted as part of the review process including the sewage undertaker, the Environment Agency, relevant Highway Authority, Canals and Rivers Trust and (where appropriate) any Internal drainage boards.</p> <p>The SAB will have a duty to adopt and maintain drainage systems that have been approved and constructed in accordance with the National Standards, with the exception of single property systems and publicly maintained roads.</p>

Environment Agency

The Environment Agency (EA) has both a national strategic role and local operational role in relation to flood risk management.

National Strategic Role

The Floods and Water Management Act requires the EA to publish the National Strategy. The National Strategy has guiding principles that need to be incorporated into the Local Strategy. The National Strategy aims to define and understand the roles and responsibilities of risk management authorities and to provide information to communities at risk.

The National Strategy identifies the following strategic actions for the EA:

- Use Strategic Plans such as the Catchment Flood Management Plan (CFMP) and the Shoreline Management Plan to set the direction of Flood risk management;
- Support the creation of Flood Risk Regulation by collating and reviewing the assessments, plans and maps that Lead Local Flood Authorities produce;
- Provide data, information and tools to inform government policy and aid risk management authorities in delivering their responsibilities;
- Support collaboration, knowledge-building and sharing of good practice including provision of capacity-building schemes;
- Manage the Regional Flood and Coastal Committees (RFCCs) and support their decisions in allocating funding for flood defence and flood resilience;
- Report and monitor on flood and coastal erosion risk management; and
- Provide grants to risk management authorities to support the implementation of their incidental flooding or environmental powers.

Local Operational Role

The EA's local operational role includes emergency planning, advising on planning applications in relation to flood risk and managing flooding from main rivers and reservoirs.

Emergency Planning

The EA, as part of their role in emergency planning, contributes to the development of multi-agency flood plans. These are developed by local resilience forums to help the organisations involved with responding to a flood work efficiently together.

To help provide better warning to organisations, the media and the public the EA also work with the Met Office jointly in the Flood Forecasting Centre.

Main Rivers

Main Rivers are watercourses shown on the Statutory Main River Map held by the EA and DEFRA. The EA has permissive powers to carry out works of maintenance and improvement on Main Rivers. This can include any structure or appliance for controlling or regulating flow of water into or out of the channel. The overall responsibility for maintenance of Main Rivers lies with the riparian owner.

The EA can bring flood defence schemes forward through the Regional Flood and Coastal Committees, and it will work with lead local flood authorities and local communities to shape schemes which respond to local priorities. The EA are also the regulating authority with regards to consenting works carried out by others, in, under, over or within 8 metres of a main river in accordance with the Local Bylaws.

Reservoirs

The EA enforce the Reservoirs Act 1975, (amended within the Floods and Waters Act 2012), which is the safety legislation for reservoirs in the United Kingdom. The EA is responsible as the Enforcement Authority in England and Wales for reservoirs that are greater than 25,000m³ (amended to 10,000m³ in Floods and Waters Act but is yet to be enacted). As enforcement Authority the EA must ensure flood plans are produced for specified reservoirs. However the responsibility for carrying out work to manage reservoir safety lies with the reservoir owner/operator who should produce the flood plans.

Highway Authority

As Highway Authority (HA), BFC has the same obligations to co-operate on flood risk issues. It also has the following responsibilities under other legislation:

Responsibility to maintain highways, including ensuring that highway drainage systems are clear and that blockages on the highway are cleared. This is a duty under the Highways Act and therefore strategic highways are inspected and maintained regularly.

As HA the Council also has powers to deliver works that they consider necessary to protect the highway from flooding. These works can either be on the highway itself or on land which has been acquired by the HA in the exercise of highway acquisition powers.

The HA may divert parts of watercourses or carry out any other works on any form of watercourse if it is necessary for the construction, improvement or alteration of the highway or provides a new means of access to any premises from the highway.

The SuDS Approving Body has no obligation to adopt any part of a drainage system which is a publicly-maintained road. If it is on a Highways Agency road, the Highways Agency is expected to adopt and maintain the part of the drainage system on its property in accordance with the approved proposals and the National Standards for sustainable drainage.

Thames Water

The water industry is highly regulated and the quality of customer service and the prices they are able to charge their customers are regulated by the Water Services Regulation Authority (WSRA), commonly known as Ofwat. Thames Water is the principle sewer authority operating within Bracknell. Thames Water has the following responsibilities for flood risk management:

- Respond to flooding incidents involving their assets; including storm sewers draining and located under a public highway.
- Maintenance of a register of properties at risk of flooding due to hydraulic overload in the sewerage network (DG5 register)
- Provide, maintain and operate systems of public sewers and works for the purpose of draining an area;
- Have a duty to co-operate with other relevant authorities in the exercise of their flood risk management functions;
- Must have a regard to national and local flood risk management strategies; and
- Statutory consultee to the SAB when new drainage systems are proposed to connect to existing public sewer.

The DG5 Register

All water and sewerage companies maintain a register of properties at risk of flooding due to hydraulic overload in the sewerage network; this is known as the DG5 register and part of the set of Ofwat DG (Director General) Indicators.

The DG5 Register is a register of properties and areas that have suffered or are likely to suffer flooding from public foul, combined or surface water sewers, due to the system being overloaded. There are 3 at risk reporting categories:

- 1 in 20 year;
- 1 in 10 year; and
- 1 in 2 year.

This reporting category reflects the frequency of flooding incidents in properties/areas and the return period of the storm that causes the flooding. For a sewer to be classified as over-loaded the flow of a storm must be unable to pass through it due to a permanent problem not due to problems such as blockage, siltation or collapse. Flooding that occurs during more intense storm events (greater than 1 in 20 years) is also excluded. When a solution is in place to rectify the overloading a property or area is removed from the register.

Tackling sewer flooding

As part of the obligation to Ofwat, sewerage companies are required to undertake capacity improvements to alleviate sewer flooding problems on the DG5 register during the current Asset Management Period (2010 – 2015) with priority being given to more frequent internal flooding problems.

2.3 Other stakeholders

Local communities & householders

Communities have vital knowledge about the history of flooding in their area and can make important contributions to helping manage the levels of flood risk. This includes taking steps to reduce the impacts of flooding on their properties. BFC's policy on the distribution of sandbags is provided in the Annexes.

RMAs are unlikely to be able to record every incident of flooding that occurs in the Borough without the help of Parish Councils and Communities, especially those that do not directly flood properties. However, flooding incidents which affect roads or enter the curtilage of properties are important to record. They can indicate that there has been flooding in relatively regular rainfall events which would warn that the properties are at risk in more extreme rainfall events. This information is crucial in building up cases for flood defence and flood resilience schemes.

Communities affected by flooding should report the incidents to BFC, via Customer Services, who may or may not undertake a formal investigation. The decision on whether an incident will be investigated formally will be in accordance with the flood investigation policy within the Annexes to this document.

Residents may also wish to take a proactive approach to flood risk by signing up to Floodline Warnings Direct through the EA. The free flood warning service gives advance notice of when

flooding from rivers is likely to happen and gives time to prepare. Warnings can be received by a variety of means including text, phone, e-mail etc.

Many residents may be unaware of the flood risk to their property if there has not been a flooding incident while they lived there. The EA provide guidance and information on preparing for flood events through their website, including information on flood information in the form of flood risk maps.

It is the responsibility of householders and businesses to look after their property including protecting it from flooding. Whilst in some circumstances other organisations or property owners may be liable due to neglect of their own responsibilities, there will be many occasions when flooding occurs despite all parties meeting their responsibilities. It is also vitally important that householders whose homes are at risk of flooding, take the following steps to ensure the impact to their home reduced:

- Check whether their household is at risk from flooding from all sources;
- Ensure that preparations have been made in the event of a flood;
- Take measures to ensure that the impact of flooding to their household is reduced, either through permanent measures or temporary measures; and
- Where possible take out flood insurance.

Local Planning Authority

As well as being the LLFA BFC is also the Local Planning Authority. They are responsible for the production of strategic planning documents such as the Local Plan/Core Strategy that guide new development and regeneration within the Borough. They also determine planning applications in line with national and local policies.

Landowners

Landowners whose property is adjacent to a river, stream or ditch are likely to be riparian owners with responsibilities. If a property borders a river, stream or ditch then the property owner is likely to be a riparian owner, owning the land up to the centre of the watercourse. Land registry details should confirm this.

Riparian owners have a duty to protect their property from flooding but in most cases will need to discuss the methods of doing this with the EA or BFC. They also have the responsibility for maintaining the bed and banks of the watercourse and ensuring there is no obstruction, diversion or pollution to the flow of the watercourse. Any works to the watercourse will need consent from either the EA (if Main River) or the BFC (if an Ordinary Watercourse). The GA and BFC have enforcement and consenting powers under the FWMA and other legislation.

Businesses

Utility and infrastructure providers such as Network Rail, energy companies and telecommunication companies are not Risk Management Authorities as defined by the FWMA. However they have a crucial role to play in flood risk management as their assets can be important consideration in planning for flooding. They may have assets such as culverts and bridges that have the potential to restrict flood flows and increase the risk of flooding to the community, information about these assets needs to be shared with the risk management authorities. They may already maintain plans for the future development and maintenance of

the services they provide and it is important that they consider flood risk management issues during this planning process. This will help to ensure that their assets and systems are resilient to flood risk and that the required level of service can be maintained in the event of an incident.

2.4 Berkshire Five Strategic and Technical Groups

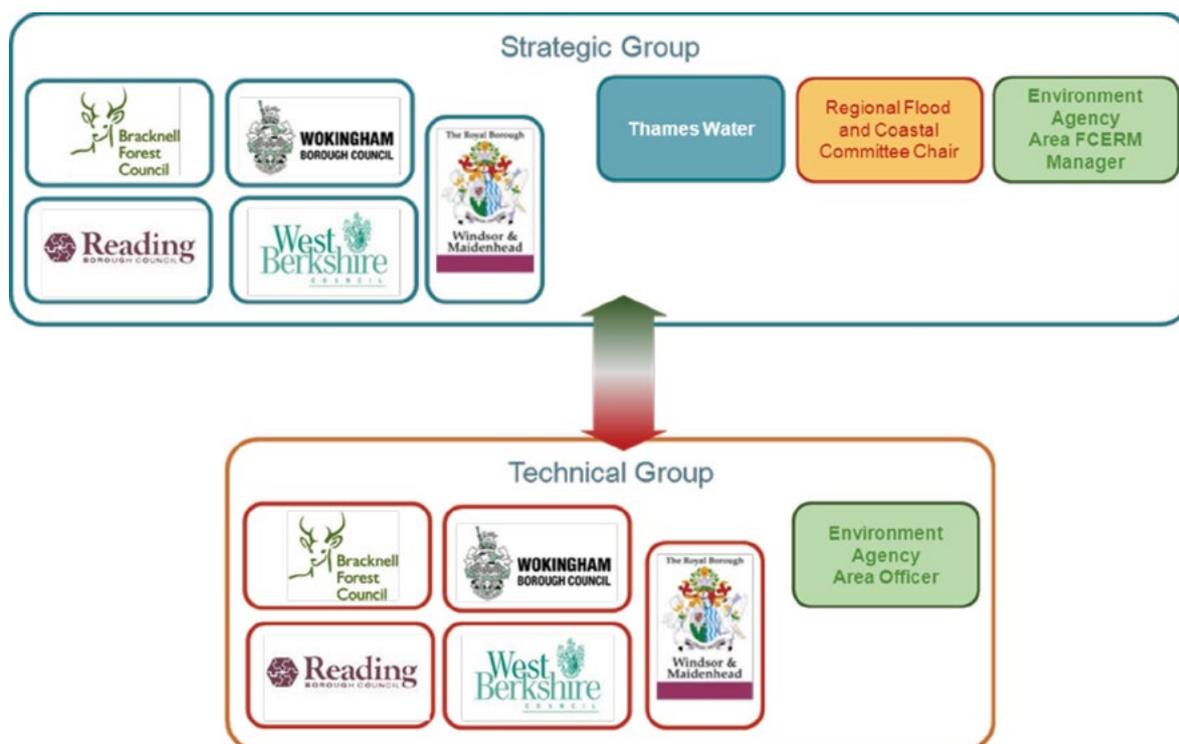
The FWMA encourages Risk Management Authorities to work together and cooperate on flood risk management. As part of this work BFC have played an active role in setting up and working with other LLFAs within the Berkshire and Hampshire area.

The Berkshire Group was set up to facilitate discussions on the implementation of the FWMA and to share best practice. The Berkshire Five Group consist of five of the Berkshire Unitary Authorities, these are:

- Bracknell Forest Council (BFC);
- Reading Borough Council (RBC);
- Royal Borough of Windsor and Maidenhead (RBWM);
- West Berkshire Council (WBC); and
- Wokingham Borough Council (WBC).

N.B. Slough Borough Council have aligned themselves with South Buckinghamshire Council due to the local drainage catchments.

Figure 2.1: Berkshire Strategic and Technical Group Structure



There are two separate groups. The Strategic Group comprises heads of department within the LLFA, the Environment Agency and the Chair whom is a representative of the Thames Regional Flood and Coastal Committee. The Strategic Group set the direction and guide the work of the Technical Group.

The Technical Group is comprised of officers within the LLFA which aim to discuss the technical aspects of how the Floods and Water Management Act will be implemented. The Technical Group provide information and suggest approaches to the implementation of the FWMA for decisions at the Strategic Group.



3 Nature of Flood Risk within Bracknell

3.1 Overview of Bracknell Forest Borough

Bracknell Forest Borough covers an area of approximately 109 square kilometres and contains three main towns. The largest is Bracknell which lies in the centre of the Borough. To the south of the Borough are the towns of Crowthorne and Sandhurst.

Outside the town, the south of the Borough is forested, the majority of which is owned by The Crown and Forestry Commission. The north of the Borough is mainly rural, agricultural land. The Borough is made up of six parishes, these being Binfield, Bracknell, Crowthorne, Sandhurst, Warfield and Winkfield.

The main rivers in the Borough are The Cut and the River Blackwater. The Cut flows from North Ascot in a northern direction along the eastern boundary of the Borough, before turning west and flowing past the northern boundary of Bracknell, where it is joined by a tributary from within the town. It then turns north again, exiting the Borough at Westley Mill. The River Blackwater flows along the southern boundary of Bracknell and is flanked by a series of ponds and lakes, i.e. Yateley Lakes, Trilakes Fisheries and the Country Park. Both rivers form part of the Thames River Basin and are the responsibility of the Environment Agency Thames Region. Multiple tributaries and drainage ditches flow into these Rivers; these are not classified as main rivers.

The bedrock geology of the Borough generally consists of Bagshot, Windlesham and Camberley Sand Formations (beds of sand, silt and clay) to the south and London Clay to the north of Bracknell.

3.2 Flood risk within Bracknell Forest

Historical flood incidents recorded by BFC have been captured as four main event years, 2000, 2002, 2006 and 2007. These flood events were mainly caused by surface water flooding, which can be directly attributed to rainfall storm events which occurred over all or some parts of the Borough. In the last two flood incidents, surface water flooding was experienced as drainage systems and the underlying soils became overloaded and unable to cope with the volume and intensity of rainfall.

Historical flooding within the Borough is based on information gathered by BFC, Thames Water and the Environment Agency. This historical information is summarised within this chapter.

Table 3.0: Historical Flood events

Date	Brief Description	Source
7th – 8th May 2000	Localised flooding across the Borough, number of properties unknown.	Surface Water
8th August 2002	Localised flooding across the Borough, number of properties unknown.	Surface Water
17th November 2006	Localised flooding across the Borough, number of properties unknown.	Surface Water
20th July 2007	Localised flooding across the Borough. Estimated no. of properties < 10	Surface Water

Table 3.0 above does not intend to provide an exhaustive list of all flood events or areas affected by flooding, but rather an indication of the types of flood events which have occurred in the past.

This information does not indicate locations that may be susceptible to future flooding due to local changes such as improvements to drainage systems.

The Environment Agency (EA) have produced fluvial flood maps and Flood Maps for surface water, these are based on mathematical modelling. See figures in Annex A. The surface water mapping is due to be updated within 2013.

3.3 Types of flooding

Surface water flooding

The Preliminary Flood Risk Assessment (PFRA) was undertaken by BFC to satisfy their obligations under the EU Floods Directive. This work identified key areas within Bracknell Forest where the potential risk of flooding is thought to be greatest.

As part of the PFRA, it had been identified from the historical flood records, that the most recent and significant surface water flooding to affect the Borough was recorded on the 20th July 2007 with a 1 in 33 chance of occurring (Bracknell Forest PFRA). Heavy rainfall over the previous weeks had caused a degree of saturation to soils, resulting in less infiltration through the underlying geology, leading to high surface water runoff rates in a short amount of time.

The Historical Flood Records also indicated similar issues, albeit to a lesser extent, during storm events in 2002 and 2006.

The EA has also published surface water mapping, this is based on mathematical modelling these provide flooding extents from surface water for two storm events (30 year and 200 year annual probability of occurrence). Refer to Annex A for the Flood Maps for Surface Water Flooding for both the 30 year and the 200 year return period.

The EA Flood Map for Surface Water within Bracknell identifies surface water flooding within the Borough as relatively sporadic, with discrete patches of surface water flooding across the whole catchment.

Sewer flooding

Records of flooding from the surface and foul water sewers have already been provided for the PFRA and the SFRA from Thames Water.

Groundwater flooding

Groundwater flooding in Bracknell Forest is unlikely due to the underlying geology. An exception to this is along the watercourses where the presence of river gravels or alluvium can act as local aquifers and potentially cause groundwater flooding. Refer to Annex A which includes a map to show the areas susceptible to groundwater flooding and indicates a low probability of risk within the Borough.

The EA have generated maps showing the percentage of an area being susceptible to groundwater flooding. These show the Borough divided into squares and the percentage of this square being susceptible to groundwater emergence. Much of the Borough is covered by squares less than 25% susceptible. It should be noted that the assessment has been undertaken on a broad scale.

River (Fluvial) flooding

The EA modelled floodplains in the north of the Borough tend to be along relatively narrow floodplains associated with The Cut, typically covering approximately 100m to 200m in width. This mapping indicates that the downstream floodplain of The Cut could reach a width of approximately 500m. This area is mainly countryside, but identified within the EA Flood Maps (refer to Annex A) there are existing isolated areas at risk. The EA historical flood mapping indicates that some of these properties may have experienced flooding in the past. Whilst the EA flood maps shows past flooding, no historical records of river flooding have been found along the tributaries, the Environment Agency's historical flood map indicates that the incidents of flooding mainly occur along The Cut in several locations.

Flooding in the south of the Borough associated with the River Blackwater remains within the fields and lakes situated along the River's borders, particularly on the western side. On the eastern side flood risk is generally more extensive with the flood zones extending far into the town. The EA historical flood map extent corresponds well with the flood zones along the meadows and lakes area.

The EA flood map (refer to Annex A) indicates that there is a level of past flood risk from the river, but it is not possible to verify quantities or flood levels. In some locations along the watercourse water will naturally spill out onto the floodplain.

Ordinary watercourse flooding

There are no specific flooding records related to ordinary watercourses, however some historical flooding could be attributed to watercourses of this type combining with others during a flood event.

Flooding from impounded water bodies

There are three reservoirs (those that hold 10,000m³ of water above ground); these are Mill Pond, Fish Pond in Ascot and Sandhurst Lower Lake. As yet the extent is of flooding from the reservoir inundation maps from potential breaches is not available to the public.

Mill Pond, near Wildridings Road, has a spillway which diverts flows through a pedestrian subway nearby and via paths through an industrial estate to The Cut. Mill pond was created as an attenuation pond to ease the burden of increased runoff on the sewer and river network from new developments in the area.

There are approximately 25 other attenuation ponds in the Borough which are not classified as reservoirs. Whilst the other attenuation ponds have also overtopped on occasion, there are no known incidents of flooding affecting properties.



Key Points on Local Flood Risk within Bracknell:

Generally river (fluvial) flooding is not an issue within the Borough.

Historical surface water flood events have been sporadic.

The risk of groundwater flooding is low due to the nature of the geology

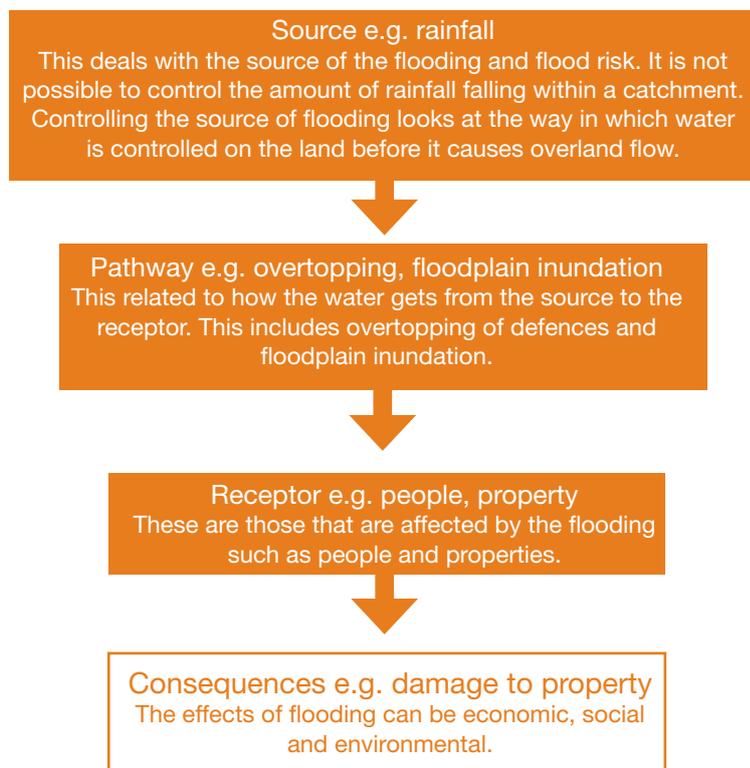


4 Options and funding

4.1 Options for managing local flood risk

When considering flood risk management there are many different options that can be utilised to reduce the risk of flooding to individuals. However the options cannot remove the risk completely as there can always be an extreme event that may exceed the design standard of the measure put in place. It is also important when considering methods to consider the Source, Pathway, Receptor and Consequences model.

Figure 4.0: Source - pathway- receptor- consequence



When deciding what combination of flood risk management measures or strategies to adopt it is important that the same general performance features are considered for each and every option. These should be considered together with the specific characteristics that affect the performance of that option.

4.2 Options suitable for Bracknell Forest Council (BFC)

There are a number of options for managing flood risk within the Borough.

Options to control the source – reducing runoff from the catchment
<p>These methods help reduce or delay the runoff entering the system of drainage systems; and reduce or increase the speed at which water is conveyed downstream.</p> <p>Land Use The generation of surface water runoff can be reduced through the implementation of certain agricultural practices. For example, land can be ploughed across the slope of the land thereby, reducing the effect of channelling of water over the land when it rains. Measures can include incorporating buffer strips on farm with tree planting to delay the flow of water through a catchment.</p> <p>Sustainable Drainage Systems (SuDS) The implementation of sustainable drainage measures as part of any development is a necessity to ensure future flood risk is not increased due to an increase in impermeable area. There is also potential to reduce the existing flood risk. This can include, for example, permeable paving with sub-base storage, swales, attenuation basins and ponds. These methods will act as source control method to reduce the amount of run off entering the drainage network, and therefore reduce the risk of flooding downstream from a severe rainfall event. There are also environmental benefits with the installation of these systems such as a reduction in diffuse pollution entering the watercourses. Within the borough there are watercourses which are known to have issues with regard to capacity during periods of intense rainfall. Any applications received by the Council, whether for planning or drainage permission, relating to development which would connect to these particular watercourses and their upstream catchments, may result in the imposition of stricter standards with regard to discharge rates, volumes and storage, than those recommended by the Environment Agency, National SuDS Standards and BS 8582.</p> <p>Storage These structures, providing storage can take up a large land area, but with careful design can take different forms to incorporate them into the existing landscape. These aim to control the rate in which run off is discharged into the watercourse and if ground conditions are suitable allows water to infiltrate.</p>
Options to control the Pathway
<p>Storage Where land area allows it may be possible to construct offline and online storage areas, to attenuate the flood water and discharge it from the area at a manageable rate. May require a large area, but can be multifunctional space. If it is designed to attenuate over 10,000m³ of water it may be designated as a reservoir (under the Reservoirs Act 1975, as amended by the Floods and Water Management Act 2010).</p> <p>Channel Design</p> <ul style="list-style-type: none">• reduce or increase the conveyance capacity of the watercourses (for example, by construction of bypass channels or multistage channels, by widening or deepening, or by changing the roughness of the existing channel);• Removal of constrictions to the flow within the channel or floodplain.• Flood Farming <p>Flood Farming is about getting farmers or landowners to agree to allow their land to be designed to flood more frequently through the construction of measures around an area to contain the water as it flows in. Clearly landowners would require compensation for the use of their land.</p>

Options to affect the receptor - preventing water from affecting assets

Walls and Embankments

Hard engineering techniques may be the only viable option in some areas, these methods would involve the construction of embankments and flood walls; these can be costly and have higher environmental implication on the area when compared to other methods.

Property Level

A general approach to improving community resilience should be adopted throughout the Borough, including increasing the general awareness and preparedness for a flood event in areas that are at high risk areas. There are options for home and business owners to take action in relation to resistance and resilience measures.

Resilience Measures

These are measures that allow buildings to recover quickly in the event of flooding

Existing developments in risk areas could retrofit flood resilience measures therefore allowing a property to be quickly habitable again if a property did flood.

Resistance Measures

These are described as those measures that prevent water from entering the property

In addition the properties could include property protection schemes, such as demountable flood defences and airbrick covers. These are known as resistance measures.

Exceedance

Not all flooding can be prevented but the route that overland flows or flows that exceed the drainage systems take can be controlled along the existing highways or other flow routes to areas designed to attenuate flood water. This can be achieved through:

- increasing kerb heights and property thresholds to retain water on designated sections of highway. This could be combined with existing highways maintenance and improvement projects which would make it more cost effective.
- divert flood flows to less vulnerable areas, through bypass channels or a piped network, with a suitable capacity. This can be incorporated into new development as part of the planning and design phase.

Non structural measures

A number of other measures should also be used in conjunction with any of the above methods or as standalone to further reduce flood risk. These methods are relatively simple and are the least costly:

Review asset management and maintenance methods

It is important to review the maintenance and management of drainage infrastructure and assets. This will happen for significant flood risk assets (such as culverts and weirs) through the development of the Asset Register to meet the requirements of the FWMA.

The riparian owners are responsible for maintenance of the watercourses and assets. BFC will ensure that owners are aware of their responsibilities to maintain their assets and watercourses.

Future Developments

Future developments should incorporate appropriate mitigation measures and the use of SuDS and help contribute to the reduction of flood risk in the community.

Community Flood Management Plans

These are community lead flood management plans which may be appropriate in some locations and allow the community to understand what actions they need to take in the event of a flood. This could include for example, who they should contact and if advised to evacuate, where they should go and the route that they should take.

There are currently no community flood plans within the Borough.

The table below identifies the suitability of potential flood risk management options for Bracknell.

Table 4.0: Flood risk management measures

Option	Source, pathway, receptor	Comments	Applicable for Bracknell (Yes/No/)
Land Use	Source	Farmland that generates flooding	No
Sustainable Drainage Systems	Source	Sustainable drainage systems can be implemented within all new development. The SAB Role will provide the LLFA with responsibility for approving SuDS schemes within its Borough.	Yes
Maintenance of Channels	Pathway	Maintenance of main river channels is the responsibility of riparian owners with an overview from the Environment Agency. Maintenance of ordinary watercourse is the responsibility of the riparian owners.	Yes
Improving channel capacity	Pathway	Opportunities to improve channels through development and redevelopment for main rivers and ordinary watercourse.	Yes
Increasing the storage	Pathway	This will be the creation of storage within the floodplain. Flooding from the rivers are considered to be minimal within Bracknell as a source of flooding (see Local Flood Risk Chapter)	No
Construction of flood defences	Pathway	Traditional flood defences, such as walls are likely to be of limited affect within Bracknell due to the nature of flooding.	No
Property Level Protection	Receptor	This option directly affects people's property. Bracknell floods from sporadic flooding from surface water runoff.	Yes
Community Flood Management Plans	Receptor	Allows actions to be taken to provide measures during a flood event	Yes
Flood Emergency Planning	Receptor	Allows a co-ordinated approach from Bracknell.	Yes

4.3 Managing flood risk through the requirements of the FWMA

As well as considering general options for managing flood risk within Bracknell, the FWMA identifies that the LLFA is required to undertake a number of actions.

Table 4.1: Bracknell FWMA requirements

FWMA Requirement	Description	Annex Reference
Production of Asset Register	The asset register allows identification of assets within the Borough that may have a significant impact on flood risk. Whilst this does not involve the building of defences, it helps identify existing structures that act as pathways throughout the Borough	D
Designation of Features	The designation of an important feature allows the LLFA control over this pathway structure	E
Flood Investigations	To assess the causes of a flood event and the roles and responsibilities of the Risk Management Authorities within the area. This will allow Bracknell to understand the flooding including the causes and possible measures that could be taken to reduce flood risk in the future.	B
Transfer of powers on ordinary watercourse	Bracknell will be responsible for issuing and reviewing works to ordinary watercourses. This will allow for flood risk issues to be taken into account with works to ordinary watercourses.	C
SuDS Approving Body	Bracknell will need to establish a SuDS Approving Body, to review and approve Sustainable Drainage Systems for new developments. The SAB will also be responsible for adopting and maintaining these systems.	F

4.4 Sustainable drainage requirements

Water is an essential part of our natural and built environment. The way we live, work and play to varying degrees are influenced by the availability and quality of water.

Increasingly we need to embrace water management as an opportunity rather than a challenge. Successfully delivered sustainable drainage provides communities and wider society with benefits set within the context of adapting to climate change, development and improving our natural environment.”

Extracted from ‘Planning for SuDS – Making it happen’ (CIRIA report C687, 2010)

Background

SuDS as a means of dealing with surface water are not, in themselves, a new concept.

The natural means of dealing with rainfall is through evaporation, infiltration, or take up by vegetation. Excessive rainfall that cannot be dealt with in this manner flows over land to watercourses, stream and rivers, or collects in hollows to form ponds or marsh.

Bracknell Forest Borough was fairly undeveloped prior to construction of the new town, with any development relying on soakaways or basic surface water drainage systems, using conventional pipes.

With the development of the new town in the 1950’s came a new form of surface water drainage, still based upon the use of drainage pipes, but now incorporating the concept of balancing flows, so that generally smaller pipes conveyed water to the existing water courses which were themselves either piped or altered, with water which exceeded the capacity of the pipes being stored either in ponds (such as Mill Pond) or by being diverted into dry ponds for a short time.

Most modern development within the Borough since the 1970’s has also followed this principle of balancing flows, along with restricting flows from developments so as not to overwhelm surface water sewers or watercourses downstream of the site.

Conventional surface water drainage systems

It is often perceived that this modern “conventional” form of drainage – gullies, manholes, pipework and storage – is a sustainable drainage system.

However, whilst often delivering the goals of reducing flood risk and dealing with rainfall from the development, these systems do not meet the basic requirements for SuDS.

Conventional surface water drainage systems have the following attributes:

- They are generally piped systems below ground
 - They are not legible, i.e. they do not show how they function
 - They are not easily maintainable.
- They do nothing to deal with pollutants
 - During the first flush following a period of rainfall, pollutants will be washed from surfaces, such as highways, and are then transported very efficiently into water courses

- or ponds without any treatment.
- They do not provide much in the way of amenities
Balancing ponds in the borough such as Savernake and Westmorland are mostly owned by Thames Water. Without entering into management agreements with BFC these ponds would normally be fenced off and not available to the public.
- They do not deal with all of the rainfall from a development
Water companies are only obliged to deal with rainfall up to 1 in 30 year storm events. Any flows in excess of this amount, are not catered for in the adopted public sewer system. Instead the excess rainfall is dealt with by the provision of storage which is separate and often privately owned (usually with the owners being unaware of their ongoing liabilities – as these systems are hidden below ground). However, the excess rainfall does usually drain down into the Thames Water sewers over time.
- They do not help to provide water for vegetation and trees, nor do they help to replenish the natural water table within the development.

Sustainable drainage systems

SuDS work in a different way to conventional piped systems. The systems use a variety of different techniques to not only deal with the rainfall, but also to capture pollutants and silts, as well as providing water for plants and replenishing the ground water table.

Over the past few decades where SuDS have been constructed they have not only been dealing with the rainfall from 1 in 30 year events, but also from other events up to 1 in 100, all generally being owned and managed by one body. They are therefore more integrated in their design and provide many benefits in addition to their basic function.

SuDS have been promoted by Government, the Environment Agency and by Planning Policy for some time, but their uptake has been slow. This is mainly due to a presumption that they are:

- Expensive to construct;
- Use too much land;
- Difficult to maintain;
- Difficult to design;
- Difficult to adopt by public authorities.

Publications by CIRIA, the Environment Agency and NHBC, together with practical experience from the Continent, USA and Australia, as well as pioneering work by some authorities such as Oxfordshire have shown that these perceptions are misplaced, except those regarding adoption.

The SuDS Approving Body (SAB)

The Government, following the Pitt review, took on board misconceptions about adoption, and in the Flood and Water Management Act 2010 (FWMA), published details of a new body which would be part of the Lead Local Flood Authority – the SuDS Approving Body.

Under the FWMA Bracknell Forest Council (BFC) is the designated Lead Local Flood Authority. In addition, as a Unitary Authority, it is also the Local Highway Authority (LHA) and Local Planning Authority (LPA). Therefore all the main drainage roles will come under the same roof –

thus providing the potential for better co-ordination in terms of approving new development.

When Schedule 3 of the FWMA is enacted, the SAB, will deal with the receipt and approval of Drainage Applications, together with the approval and adoption of SuDS which serve two or more properties.

When fully enacted, the SAB role will affect virtually all forms of construction within the borough.

The FWMA says in Schedule 3, Section 7 (1):

“Construction work which has drainage implications may not be commenced unless a drainage system for the work has been approved by the approving body”

The government can use an order to specify what construction work (buildings or structures) is or is not subject to approval. For example, the FWMA says that anything which covers land (such as a patio or other surface) is a structure, and would therefore (under the Act) require a drainage system to be approved. However, the order may set out a minimum size of patio which requires approval, with smaller patios being exempt.

The SAB and Planning: The SAB's new role, is independent of, but sits alongside the planning system to approve development in respect of surface water drainage. It will become a statutory consultee of the LPA with regard to planning applications.

The SAB and Highways: SuDS within adoptable highway will pass to the Local Highway Authority for maintenance, along with the new highway.

SuDS drainage applications

When fully established the SAB will be responsible for approving and where appropriate, adopting SuDS, as well as dealing with Designation, Enforcement, Appeals and arranging for future maintenance of the system, in respect of the drainage applications it receives.

Single Property Applications:

The current proposal within BFC is for single property applications to be dealt with by Building Control.

They are set up to deal with large numbers of applications for individual properties as well as large developments. The applications received are determined against set national criteria, i.e. the building regulations. The new National SuDS Standards will apply to construction work for both single and multiple properties. Currently, the Building Regulations, insofar as they apply to surface water drainage, already follow a SuDS hierarchy, with infiltration as the 1st method of draining a property, and connection to a sewer being a last resort.

The processing of a single property application would be dealt with in accordance with the timescales laid down within the National SuDS standards, together with any necessary consultations with statutory bodies, depending on the design of the drainage system proposed.

The application to drain the property can be made as part of the planning application for the

same property. With the LPA receiving the drainage application, passing it on to the SAB (in this case Building Control), and then notifying the applicant of the SAB's decision, together with any conditions which may be imposed.

Although dependent upon the final definition of "single property" by Government, it is envisaged that a single property application will include those for a supermarket, school, college or industrial development for example. In this case the surface water management techniques may result in quite complex solutions being required. Division of the property into sub-catchments would include several source control features, treatment stages, etc; all forming a management train.

For applications such as these, even though the SuDS will not be adoptable, the processing and checking will be carried out by the SuDS adoption team instead.

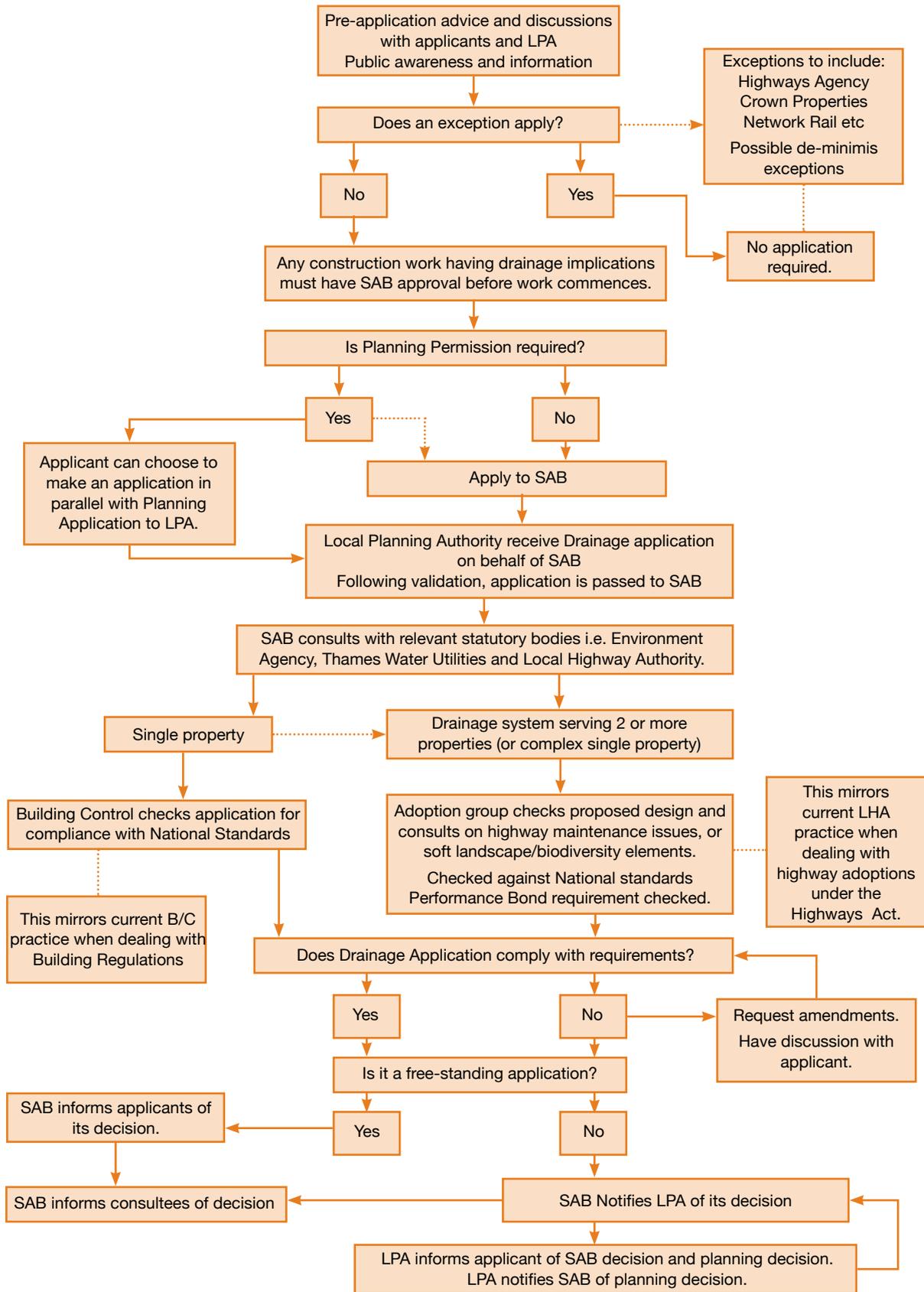
Multiple Property Applications:

Drainage applications for SuDS serving two or more dwellings, and therefore adoptable, will be dealt with by the SuDS adoption team, together with the more complex applications referred to above.

The approval process will involve:

- Pre-application discussion;
- A drainage strategy;
- Master planning;
- Technical approval;
 - Drawings,
 - Calculations,
 - Designs,
 - LHA liaison (Standard highway details and Section 38/278 approval),
 - SAB requirements,
- Bond calculation and processing;
- Commuted sum calculation and processing (during the interim period);
- Inspection fee calculation and processing;
- Adoption and land transfer arrangements with regard to highways and POS;
- Inspections during construction;
 - Highway works,
 - Public Open Space works,
 - Private SuDS,
- Pre-certification inspections to lead to maintenance period;
- Certification of works;
- End of maintenance inspections;
 - Tying in with LHA adoption,
 - Transfer of Public Open Space
- Final certification, returning Bond, Designation, etc

SuDS Approving Body Process for dealing with drainage applications



4.5 Funding options

National funding

It is important that the Local Strategy sets out how the proposed actions and measures will be funded and resourced. It is also important that this strategy sets out the different types of funding that are available to the individual LLFA.

Flood Defence Grant in Aid

The Environment Agency is responsible for allocating central government funding to manage flood and coastal erosion risk in England. Nationally, Defra spending on flood and coastal erosion risk management will reduce by 8% from 2011 to 2015.

This funding is known as Flood Defence Grant in Aid (FDGiA). It goes to flood risk management authorities (RMAs) who are formed of the Environment Agency, English local authorities and internal drainage boards (IDBs). Together, they use it to pay for a range of activities including flood defence schemes that help reduce the risk of flooding and coastal erosion.

When allocating FDGiA to RMAs, the EA follow Defra policy and guidelines, which set out what projects are able to be funded. The Environment Agency's Regional Flood and Coastal Committees (RFCCs) play an important role in agreeing programmes of work, and can raise extra funding from local authorities, known as local levy (see below). The RFCCs are made up of a majority of elected members from local authorities and representatives from other local interest groups.

Flood and Coastal Resilience Partnership funding

In April 2012 the approach to the way that Government funds flood risk management projects changed. Defra's new methodology for allocating capital funding - flood and coastal resilience partnership funding - is based on the outcomes delivered.

Funding levels for each scheme now relate directly to the number of households protected, damaged prevented and other benefits such as environmental or business benefits that will be delivered. Instead of meeting the full costs of just a limited number of schemes, the partnership approach to funding flood and coastal resilience means that Government money is potentially available towards the costs of any worthwhile scheme. Funding levels are based on the numbers of households protected, the damages being prevented, and the other benefits a project would deliver. Overall, more schemes are likely to go ahead than under the previous 'all or nothing' approach if contributions from other sources are present.

The total benefits of a scheme must exceed the costs to the taxpayer for any scheme to qualify for FDGiA.

The local levy

Local levies are paid by upper tier authorities, such as Bracknell Forest Borough Council, to the Thames Regional Flood and Coastal Committee for additional flood risk management schemes that would not otherwise proceed. The Thames Regional Flood and Coastal Committee set a local levy and vote on where to invest the local levy.

Funding to Lead Local Flood Authorities through Area Based Grants

Funding for LLFA to meet their new responsibilities has been allocated through Area Based

Grants or local services support grants. The money is not ring fenced so individual authorities must decide how much grant to spend, subject to limits on overall budget and the need for investment on other priorities. The amount of money allocated for each LLFA varies based on the overall risk within the relevant area.

Local funding

Highway budget

The Council currently delivers an annual capital budget for work on the highways drainage network. Work is prioritised according to safety, internal property flooding, social impact and the duration of flood incidents.

The Council also has a revenue budget that it uses for maintaining the highway network.

Community Infrastructure Levy (CIL)

The Community Infrastructure Levy (CIL) came into force in April 2010 and provides the local authorities with an alternative source of potential funding for flood defence and alleviation schemes; only the charging authority is able to determine what to spend the CIL on. It allows the local authorities to raise funds from new development in their area in order to pay for the impact that development has on local infrastructure.

Local authorities are required to use this funding for infrastructure needed to support the development; it can be used to construct new infrastructure, increase the capacity of existing infrastructure or repair failing infrastructure. The Localism Act 2011 includes a broad definition of the infrastructure that can be covered by this scheme including transport, flood defence, schools, hospitals and parks. Bracknell Forest has yet to adopt CIL (likely adopted by April 2014) and at this time, there are no flood defences or drainage projects listed.

Section 106 Funding – Developers Contributions

Section 106 of the Town and Country Planning Act 1990 allows a local planning authority to enter into an agreement with a landowner or developer in association with granting of planning permission. A section 106 agreement is used to address issues that are necessary to make a development acceptable, such as supporting provision of services and infrastructure.

It is recommended that any flood risk which is caused by, or increased by, new development should be resolved and funded by the developer. This can be secured through planning conditions or through a Section 106.

Other sources of funding

There are also other sources of funding currently available and there may be other funds in the future that can be used for flood risk management. A list of the current funds is provided below:

- European Regional Development Fund (ERDF) - South East England Operational Programme (SEEOP) sets out how ERDF resources are to be used in the South East Region. The Programme is based upon an analysis of the needs and opportunities facing South East England, particularly the recognised importance of decoupling further economic growth from resource consumption, pollution generation and a loss of biodiversity if the

- Region is to achieve its vision of achieving sustainable prosperity by 2016.
- Business Improvement District (BID) scheme - business-led initiative supported by government legislation which gives local businesses the power to 'raise funds locally to be spent locally' on improving their trading environment.
 - Growing Places Fund - aims to help address this constraint; enabling targeted investment in pieces of infrastructure which unlock development, allowing places to realise development values which can be recycled to provide a longer term solution to infrastructure provision.

4.6 How are Bracknell's objectives going to be achieved?

Whilst the above provides a general overview of the funding mechanisms available to all Lead Local Flood Authorities, the Objectives identified as being specific for Bracknell have been considered in the following table.

Table 4.2: How Bracknell will achieve the objectives

Objective		Potential Measures/Actions to achieve the Objective	How this is to be achieved
1	Seek to reduce the current flood risk and ensure that as the LLFA we do not increase this in the future.	This combines the measures listed below within the table and includes, planning measures, SuDS Approving Body responsibilities and requirements under the FWMA and developing schemes.	Through the measures listed within this table.
2	Deliver a local flood risk management strategy in line with the national flood risk management guidance.	Assess criteria against national guidance including the National FCERM, Flood and Water Management Act (FWMA) 2010 and existing local policies and align accordingly.	Undertaken as part of the Local FRM Strategy Production – completed. Review Strategy every 3 years.
3	Deliver the LLFA duties and responsibilities under the FWMA	Provide guidance and administer a process for consenting of new structures and maintenance of existing structures on water courses.	Information and guidance produced and process managed through existing team structures.
		Produce a flood investigation policy and publish formal investigations which meet the criteria as detailed within the policy.	Publication of Flood Investigations Policy within the Strategy. Ongoing investigations as per policy.
		Develop an asset register and designate assets as appropriate.	The Asset Register is underway. Designation process is being formulated.
		Implement the requirements in relation to sustainable drainage. Investigate requirements for extra resources when role enacted.	Interim Policy adopted. SAB process and role currently being reviewed and will be set up once this section enacted.
		Share information and work together to understand the flood risks and to plan for future flood risk management measures.	Establish a formalised internal group in relation to flood risk management with relevant functions. By Summer 2013

4	Understand and capture flooding and drainage data of the Borough.	Research, capture and record all relevant data.	Through site survey for the asset register. Through Flood Investigations when undertaken.
5	Improve the level of understanding of flood risk, within the community as well as with key agencies. Ensure understanding of roles and responsibilities and adopt partnership working to deliver realistic outcomes.	This strategy will provide a clear explanation of the roles of flood risk management authorities as well as the important roles that residents and land managers can play	Undertaken as part of the Local Strategy production.
		Ensure riparian owners are aware of their duties to keep watercourses flowing freely. Provide clearer information on BFCI website and co-deliver with the Environment Agency.	Review structure, layout and content of website and update. By Summer 2013.
		Achieved via the Berkshire 5 technical and strategic officers forum and strengthening internal/external arrangements	Continued engagement and attendance with these groups.
6	Ensure that due consideration is given to the wider environmental, social benefits and climate change requirements in both the strategy and delivery of objectives and measures.	Promote the concept of water cycle management and multifunctional spaces that will hold flood water, provide space for wildlife and local green space as part of the master planning process.	By ensuring that the planning process and the SAB role consider these aspects when reviewing applications.

7	<p>Seek to avoid an increase in flood risk as a result of new development by controlling how any additional water enters existing drainage systems.</p>	<p>Building on government guidelines on sustainable drainage we will prepare local SuDS guidance which will emphasise that there should be no increase in surface water flow from future development wherever possible. It will provide guidance on site layout and levels in new development, a robust inspection process for new SuDS and advice on impacts on natural environments.</p> <p>Ensure that planning decisions are based on up-to-date information about all flood risks and that there is a consistent approach to surface water management in new development.</p> <p>Stricter standards to be used with regard to discharge rates, volumes, storage for watercourses and their catchments known to have capacity issues.</p>	<p>Continue with interim SuDS Policy. Implementation of SAB Role which is managed through existing team structures. Standards to be developed for specific watercourses.</p>
8	<p>Currently BFC has not identified any schemes however as opportunities arise for grant funding consider whether any potential schemes may be able to benefit.</p>	<p>Use current information and the flood investigations policy as the key criteria to identify areas at most risk and develop bid submissions and schemes.</p>	<p>Where a potential issue is identified funding for studies and schemes will be sought from FDGiA/ Local Levy</p>
9	<p>Identify and deliver appropriate opportunities for training and education in flood risk management.</p>	<p>Continue to build upon existing networks and commit to highlighting continuing opportunities for education and engagement.</p>	<p>Review website and update. As and when opportunities arise, specifically with other Risk Management Authorities</p>

4.7 Next steps

Monitoring, review and updating this local strategy will be essential to ensure it remains fit for purpose and as a way of demonstrating success in delivering reduced flood risk within the Borough.

The Bracknell Forest Preliminary Flood Risk Assessment, which is the key evidence base for this strategy, will be reviewed in 2016. At this stage the strategy is set to undergo a complete review although it has been structured to allow the Annexes to be updated independently as necessary. However, our local knowledge and understanding of local flood risk will improve in coming years and there must be opportunities to update the strategy as new information becomes available, and for this reason the strategy should be viewed as a living document.

The reviews will ensure the contents are compatible with current legislation as well as a report showing progress against the set objectives. In this respect, an annual review report prepared for Environment Culture & Communities Departmental Management Team (and Corporate Management Team or Executive if substantial change warrants it) will be produced ensuring the document is as up to date as possible.



Annexes

Annex A Mapping

Flood Zone 2 – area could be flooded from a river with up to a 0.1 per cent (1 in 1000) chance of occurring each year.
 Flood Zone 3 – area could be flooded from a river with a 1 per cent (1 in 100) or greater chance of happening each year.

Figure A1 - EA flood map BFC

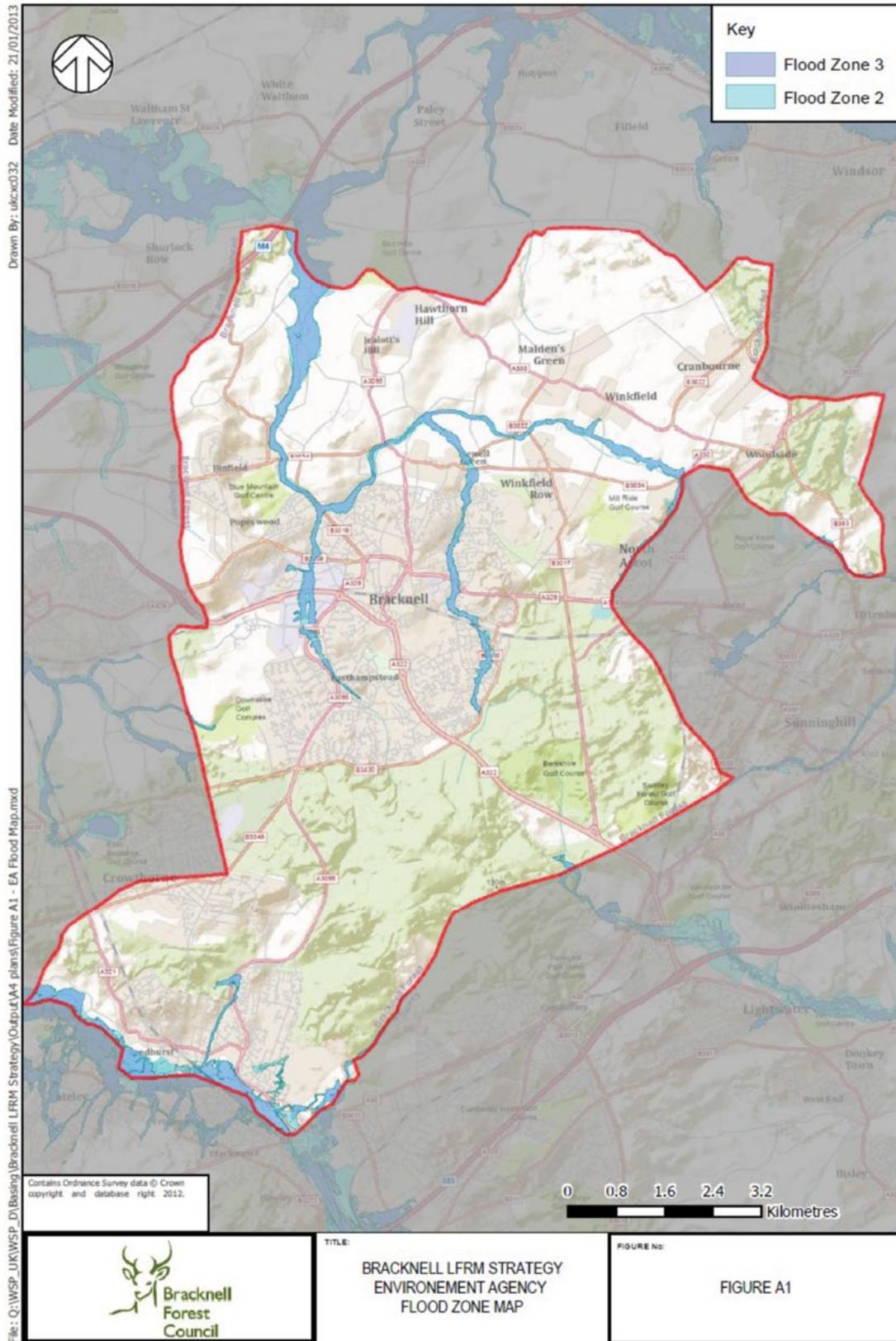


Fig A2 – Flood map for surface water 30 year BFC

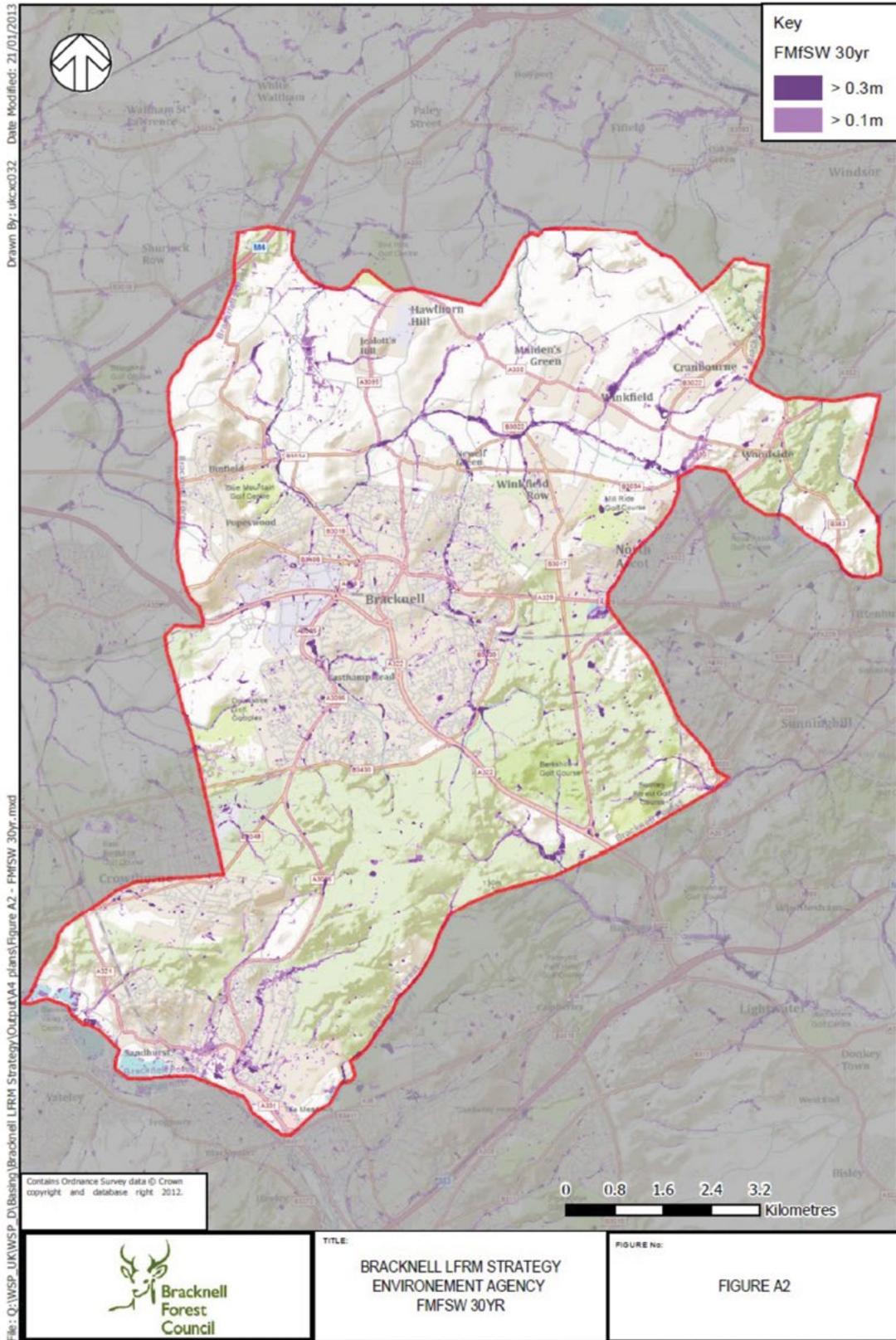


Fig A3 – Flood map for surface water 200 year BFC

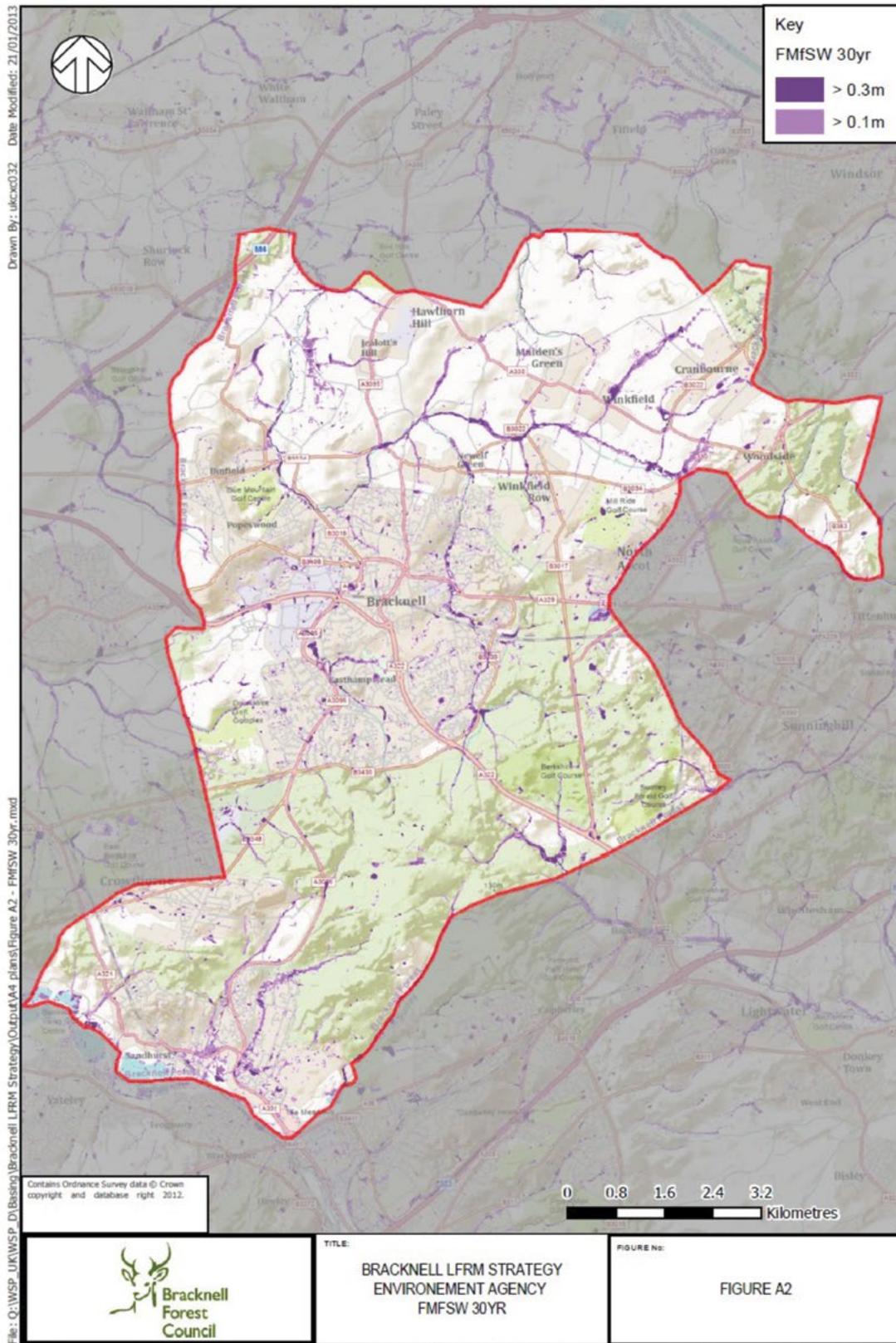


Fig A4 - Areas susceptible to groundwater flooding

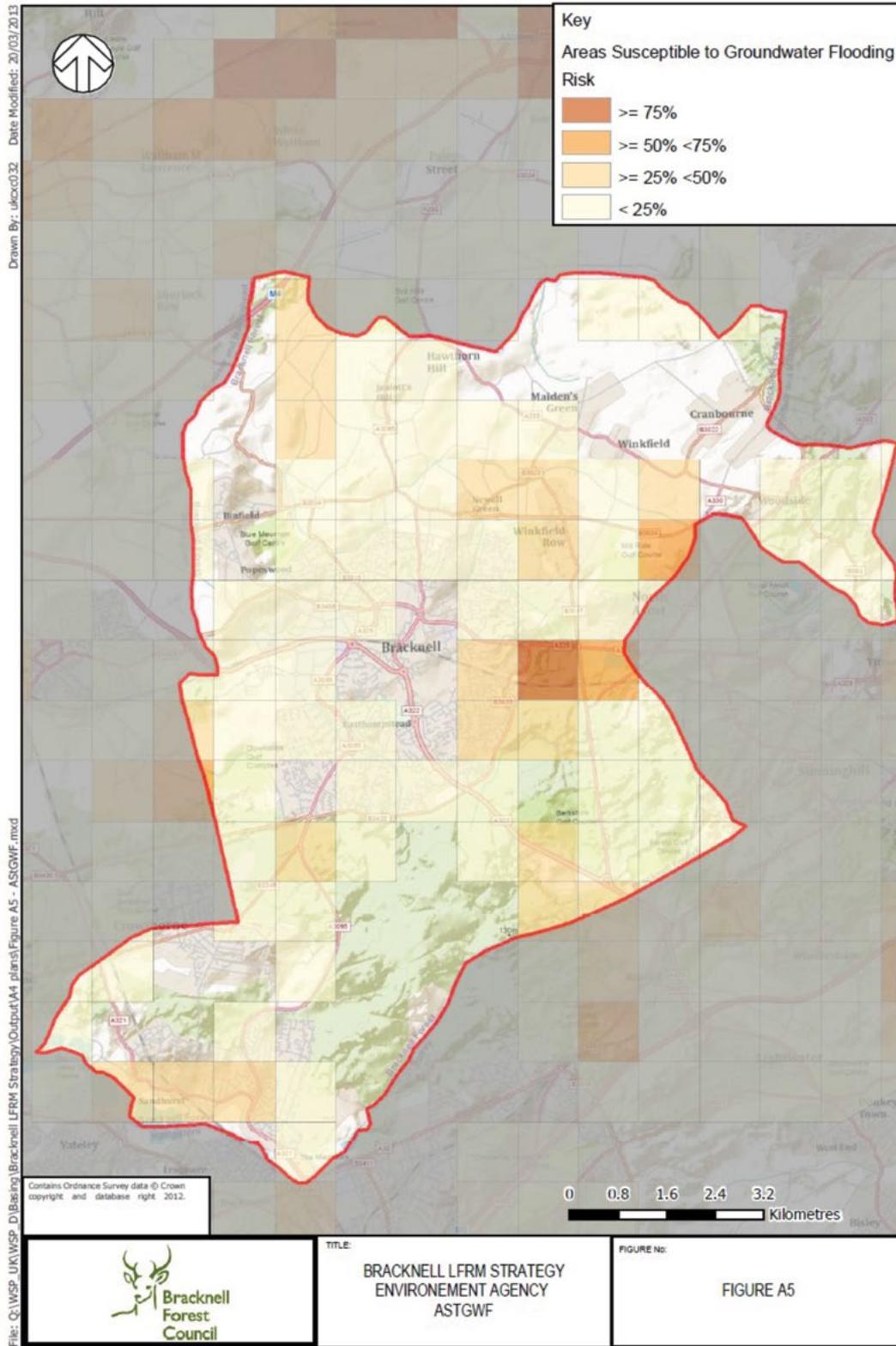
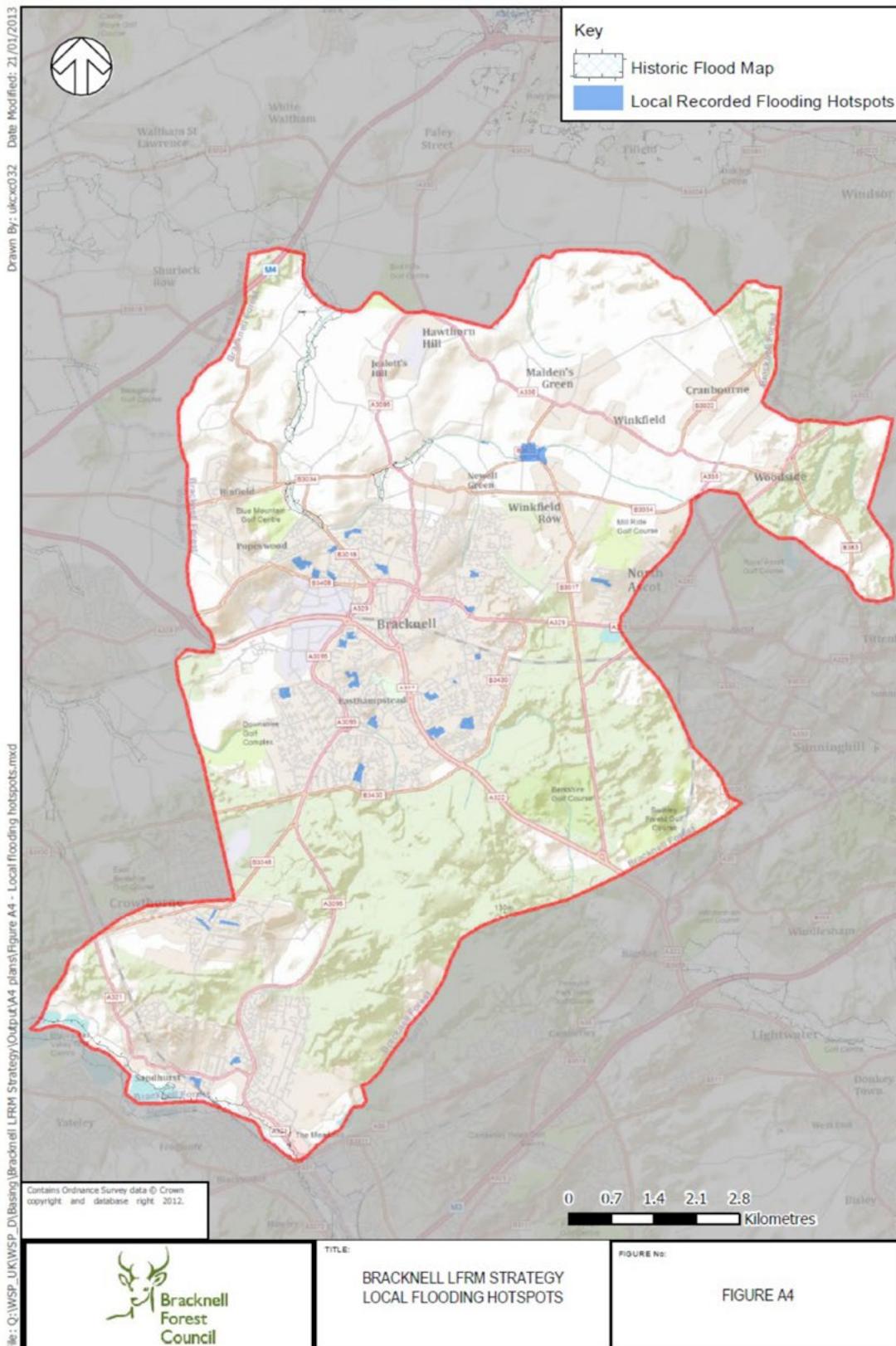


Fig A5 – Local flooding hotspots BFC



Annex B Flood investigation policy

1 INTRODUCTION

The Flood and Water Management Act (FWMA) places a duty on the Council (in its capacity as Lead Local Flood Authority) to investigate flooding incidents to the extent that it considers necessary or appropriate.

Section 19 of the Flood and Water Management Act (FWMA) 2010 outlines that:

- (1) On becoming aware of a flood in its area, a lead local flood authority must, to the extent that it considers it necessary or appropriate, investigate:
 - (a) which risk management authorities have relevant flood risk management functions, and
 - (b) whether each of those risk management authorities has exercised, or is proposing to exercise, those functions in response to the flood.
- (2) Where an authority carries out an investigation under subsection (1) it must:
 - (a) publish the results of its investigation, and
 - (b) notify any relevant risk management authorities.

“Risk management authority” means:

- (a) the Environment Agency,
- (b) a lead local flood authority,
- (c) a district council for an area for which there is no unitary authority,
- (d) an internal drainage board,
- (e) a water company, and
- (f) a highway authority.

2 THRESHOLD FOR INVESTIGATION

The Council will undertake formal investigations into flooding incidents reported by residents, or that otherwise come to its attention, involving:

- A risk to life as a result of flooding.
- Internal flooding of one property experienced on more than one occasion.
- Internal flooding of two properties or more during one flood incident.
- Flooding of critical local infrastructure.
- Ambiguity surrounding the source or responsibility of a flood incident.

The Council will formally investigate and publish a flood investigation report on events that meet the criteria above. Publication will be via the website.

The Council may also investigate and internally record (M3) smaller flooding incidents but will not be required to publish the findings of such events.

3 PURPOSE AND SCALE OF FLOOD INVESTIGATION REPORTS

Any investigations undertaken will seek to establish the likely causes of the flooding incident, the relevant risk management authorities involved and any actions proposed or undertaken by the relevant risk management authorities.

Investigations will be undertaken during, or as soon as possible after the flooding incident and will be appropriate to the scale and nature of the flooding incident. Investigations will have to be prioritised in relation to the numbers of reported incidents and available resources. The scale of the flooding will proportionally affect the size of the investigation and subsequent report.

Small scale flooding incidents and incidents where the relevant risk management authorities are immediately apparent or are undertaking actions to alleviate the cause of the flooding incident are likely to require only limited investigations.

4 CONTENT OF FLOOD INVESTIGATION REPORTS

The purpose of flood investigation reports is to inform parties which risk management authorities have relevant functions relating to the flood incident.

All published flood investigation reports should contain the following information:

- Site location, maps and photos
- Site characteristics and drainage
- Flood history and extent
- Details of the flood event (inc. Confirm reference number/date of flood event/date flood event reported to BFC/date of investigation/threshold for investigation [as outlined in sc 2 above]).
- Rainfall analysis
- Identified sources/probably causes
- Role and responsibilities
- Outcomes of investigation including proposed activities and recommendations

5 DISCLOSURE OF INFORMATION

Refer to disclosure of information section in Local Flood Strategy. It should be noted that initial reports are likely to be received as anecdotal evidence from members of the public, in depth investigations will likely require officers to visit and undertake their own evidence collection. The published report does not have to detail the specific detail of what was affected or proposed mitigation, e.g. specific addresses. Generic areas can be referred to. However it is worth noting that if properties have flooded then the owners have obligations to declare flood information in any insurance contract or property sale.

6 PUBLICATIONS OF FLOOD INVESTIGATION REPORTS

The findings of all flood investigation reports will be made publicly available via the website and linked to Confirm records.

Annex C Consenting process

As of April 2012 responsibility for the consenting of works by third parties on ordinary watercourses under Section 23 of the Land Drainage Act 1991 (as amended by the Flood and Water Management Act (FWMA)) has transferred from the Environment Agency to the LLFA.

As LLFA we are now responsible for the consenting of works to ordinary watercourses and have powers to enforce un-consented and non-compliant works. This includes any works (including temporary) that affect flow within the channel of any ordinary watercourse (such as in channel structures or diversion of watercourses).

Consent is refused if the works would result in an increase in flood risk, a prevention of operational access to the watercourse and/ or they pose an unacceptable risk to nature conservation. The clear guiding principle will be to ensure that obstructions are kept to a minimum and not increase the risk of flooding. Where obstructions are inserted without consent or in a manner contrary to a consent the LLFA has powers to enforce their removal or take remedial action.

Information about the need for consents and the consenting process are available on the website.

www.bracknell-forest.gov.uk/emergenciesflooding

Annex D Register/record of flood risk assets

The duty commenced in April 2011. It requires all LLFAs to maintain a register of structures or features (asset register) which are likely to have a significant effect on flood risk in their area.

Flood risk assets are structures or features which are considered to have an effect on flood risk. An example could be an embankment protecting properties and therefore decreasing flood risk, or an undersized culvert in a residential area, which may actually increase flood risk during high rainfall.

The requirement is to ensure there are records of all significant assets available for use by risk management authorities (asset record) and for inspection by the public at all reasonable times (asset register).

The asset record will include a map of local flood risk assets along with clarification as to whether the asset is publicly or privately owned. The asset register will then provide further information about each asset and contact details for the owner/maintainer. There has often been much confusion over the ownership and maintenance responsibility of assets. This is likely to be due to local drainage infrastructure commonly being hidden underground or along land line boundaries where landowners do not realise or acknowledge they have any responsibilities. The asset register is a way to address this problem.

There are no defined criteria as to what defines an asset as significant but a key criteria is location. Future flood risk mapping and flood history at the site will be used to assess significance.

Although the process has started it will take a number of years before this register is sufficiently comprehensive to be of real value in flood risk management.

New sustainable drainage assets will be recorded via the SuDS approval process and included on the register.

Annex E Designation process

LLFAs and the Environment Agency are known as ‘designating authorities’. That is, they may ‘designate’ natural or artificial features or structures that are important for flood risk management. The process is set out within the FWMA.

They may designate features or structures where the following four conditions are satisfied:

1. The designating authority thinks the existence or location of the structure or feature affects:
 - a) a flood risk, or
 - b) a coastal erosion risk.
2. The designating authority has flood or coastal erosion risk management functions in respect of the risk which is affected.
3. The structure or feature is not designated by another authority.
4. The owner of the structure or feature is not a designating authority.

If an asset becomes ‘designated’ its owner cannot alter or remove it without first consulting the designating risk management authority. The designation process covers both the initial designation by the designation authority and an appeals process which is available to the owner of the structure or feature. Once designated the designating authority will have enforcement powers should the structure or feature be altered or modified without permission.

The aim of designating flood risk assets is to safeguard them against unchecked works which could increase flood risk in the area. Designating of features or structures is not something that will be done regularly but only when there are concerns about the asset.

As yet there has been only limited progress with regards to designation process.

Annex F SuDS approving body

Sustainable drainage systems – Local guidance

Planning applications

When making planning applications, developers will get the best results if they consider the use of SuDS options early in the site evaluation and planning process, not just at the detailed design stage.

Trying to retrofit a sustainable drainage system into a layout which has already been designed is very difficult. It can lead to a design which compromises the benefits of SuDS, results in excessive land take and usually costs more than a conventional drainage system.

It is therefore important to engage in early discussions with the SuDS team, who work alongside their colleagues in the highway and planning authorities. This will ensure that surface water management is integrated into the development, leading to an effective drainage design with costs adequately considered at the start of the development.

There will be a SuDS solution to suit the site, due to the wide range of components available. To determine the right technique it is necessary to first establish the soil conditions and hydrology of the site and use the results of the investigations to support the drainage proposals. The choice can also be significantly influenced by the quality of the land (whether it is affected by contamination), the need to protect vulnerable groundwater sources and the permeability of the soil.

SuDS solutions are most cost effective when designed to work with the natural drainage pattern of the site, for example designed to use existing ditches or natural depressions for swales and ponds or designed to form part of hard and soft landscaped areas. Ponds and green spaces will provide habitats for wildlife to flourish, reduce pollution and provide areas for people to enjoy, adding value to the site.

In the early stages of the site design, consideration should be given as to how the drainage system will be adopted and maintained in the future. It is likely these decisions will influence the design just as much as the technical considerations.

What is expected from the developer?

- Use “Planning for SuDS – making it happen” CIRIA C687 to guide the planning of the site;
- Consider how to manage the rate of surface water run-off so that it is similar to the conditions before the development. Also consider the effect this run-off will have on any receiving watercourse;
- Use the “Code of Practice For Surface Water Management For Development Sites” BS 8582, to provide guidance in developing a drainage strategy for the site;
- Speak to the SuDS team about the surface water drainage proposals for the site. They can advise on what consents will be required, which types of SuDS are unsuitable and whether to take special precautions to prevent pollution or reduce infiltration;
- When carrying out the detailed SuDS design, use “The SuDS Manual” CIRIA C697 to inform the choice of SuDS components, maintenance, etc; for the development;

- Demonstrate in the Flood Risk Assessment (FRA) that surface water will be dealt with by installing the best combination of SuDS techniques for the site;
- Whilst constructing the site, protect adjoining areas from flooding;
- Consider the timetable for construction. Where permeable surfaces are installed, ensure they are not blocked with silt from site activities. Ensure that any planting is carried out in the right conditions;
- Ensure there is an adequate management and maintenance system in place to ensure operation of the drainage system until final adoption.

Pre-application discussions

The SuDS team will either engage in direct pre-application discussion with developers, or as part of a multi-disciplinary team as part of LPA discussions. The importance of early discussions cannot be over-emphasised. They should establish the following:

- a. planning and environmental objectives for the site (drainage strategy);
- b. requirements of the local drainage approval and adoption processes, including agreements, inspections, maintenance periods, commuted sums for future maintenance, etc;
- c. environmental or technical constraints to drainage design for the site;
- d. the need for a Flood Risk Assessment (FRA);
- e. planning layout and constraints – in joint discussions with the Local Planning Authority;
- f. highway layout and constraints – in joint discussions with the Local Highway authority;
- g. establishing blue and green corridors within the development;
- h. design criteria for the site surface water management system;
- i. designing the surface water management system for future maintenance;
- j. opportunities for the surface water management system to deliver multiple benefits;
- k. land ownership for drainage routes and points of discharge (including proposed sewer connections);
- l. existing drainage systems - both on and off site;
- m. stakeholder responsibilities and requirements, including timescales for any likely approvals/consents;
- n. temporary drainage during the construction phase(s).

For larger sites or multi plot developments, where the land is sub divided into separate plots owned by different landowners, or where there is an intention to develop the land in phases, the specification for a drainage Master plan (Design Code) should be agreed at this stage.

The Master plan should be designed to ensure effective communication between all developers and identified stakeholders in establishing the selection, implementation and phasing of source control, site and regional and/or linking drainage components, together with responsibilities for temporary drainage and maintenance during construction.

Outline planning application

The following information should be presented to enable determination of the application:

- a. proposed approach to managing flood risk from all sources, to both on-site and downstream receptors;
- b. drainage Strategy and/or Master plan;

- c. Topographical survey of the site, including cross-sections of any adjacent water courses for appropriate distance upstream and downstream of discharge point if appropriate
- d. proposed drainage design including treatment, conveyance, storage, exceedance;
- e. locations and multi functional use of drainage 'space' to meet community and environmental requirements;
- f. proposed split of the surface water management systems between private (i.e. within curtilage) and public (i.e. in public open space and/or highway);
- g. surface water management components, and confirmation of approval and adoption arrangements;
- h. development design objectives for climate resilience;
- i. the relationship with and links to the FRA, Drainage Strategy, Water Framework Directive, Planning, Sustainability and Environmental Policies (National, Regional and Local).

The drainage strategy should include:

- a. the technical design criteria for the development site(s);
- b. the site FRA and an assessment of the implications for the drainage design;
- c. indicative drainage design;
- d. details of any offsite works and consents required;
- e. identification of discharge points or receptors i.e. to ground, watercourse or sewer;
- f. identification of sensitive receptors, including groundwater protection zones, habitat designations or archaeological features;
- g. an assessment of the need and opportunity for rainwater harvesting and use;
- h. evidence of infiltration capacity at the site and suitability of infiltration drainage;
- i. an indication of the range of components to be included in the detailed design and their use in meeting the design criteria for the site;
- j. design calculations for 1 in 2 year (Q BAR), 1 in 30 year and 1 in 100 year showing pre-development (greenfield or brownfield as relevant) and post-development runoff rates, critical storm duration and associated storage estimates to determine the scale (and associated land take) of conveyance and storage structures;
- k. inclusion of climate change, future development allowances and quantification of any surface water flows on-site from off-site locations;
- l. temporary drainage during construction;
- m. draft proposals for delivering multi functional benefits, adaptability and green infrastructure;
- n. the relationship with and links to the Water Framework Directive, Planning, Sustainability and Environmental Policies (National, Regional and Local)

The master plan (in addition to the drainage strategy information) should include:

- a. details of phasing;
- b. individual plot discharge and storage constraints;
- c. who would be responsible for construction, maintenance and adoption of the regional and/or linking components of the drainage system;
- d. who would be responsible for controlling the overall surface water management of the site (Design Code);

Detailed design

The final submission on the detailed design and layout of the surface water management system should update and enhance the Drainage Strategy and/or Drainage Master plan, taking into account the advice from the SuDS team and stakeholder inputs, and should include:

- a. Final design calculations to demonstrate conformity with the design criteria for the site;
- b. Existing and proposed site sections and site levels;
- c. Long sections and cross sections for the proposed drainage system;
- d. Plan of proposed SuDS with catchment areas including impermeable areas and phasing;
- e. Details of connections to watercourses and sewers;
- f. Topographical survey of the site, including cross-sections of any adjacent water courses for appropriate distance upstream and downstream of discharge point if appropriate;
- g. Details of any offsite works required, together with any necessary consents;
- h. Operational characteristics of any mechanical features including maintenance and energy requirements;
- i. Plan demonstrating flooded areas for the 1 in 100 year storm when system is at capacity and demonstrating flow paths for design for exceedance;
- j. Access arrangements for all proposed SuDS;
- k. Management plan for all non adopted drainage;
- l. Landscape planting scheme if proposing vegetated SuDS;
- m. Plan for management of construction impacts including any diversions, erosion control, phasing and maintenance period (pre-adoption);
- n. Health and safety plan, if appropriate, considering areas of open water and confined space entry.

For a large site or multi-plot development, in addition to the above:

- a. Phasing plan;
- b. Details for design, construction, maintenance and adoption of the regional and/or linking components of the drainage system;
- c. Final details of individual plot discharge and storage constraints;
- d. Programme for construction;
- e. Final details of responsibility for controlling the overall surface water management of the site (Design Code).

Allowance for urban creep

Increased development within urban areas can have an impact on flooding, particularly surface water flooding. Urban creep describes activities such as paving over gardens and building extensions. This sort of development increases the hard surfaces in a catchment, reducing the opportunity for water to filter into the soil, increasing the volume of water which has to run off into drains and the speed at which it flows, thus increasing the intensity of the peak flow.

The activities which make up urban creep are often outside the development management process (known as permitted development) so their impacts on flooding are less likely to be controlled than development which is subject to normal planning procedures.

This is especially true in the short term as planning policies governing permitted development

look set to be relaxed in order to promote increased economic development.

The LLFA (and subsequently the SAB) will look for all future development to have an allowance for creep built into any surface water design this will either be the figure in the new BS8582 or 10% whichever is greater.

Designing for Exceedance

Whilst SuDS are generally designed to cope with rainfall in excess of that used for public sewer design, nevertheless it would be prohibitive to design a system to cope with all rainfall events. Any development should therefore be designed to deal with any water which exceeds the design capacity, this is called exceedance.

The LLFA will expect all development to be designed to ensure that exceedance is allowed for, and that flow paths are provided to deal with this situation. Exceedance should not have a detrimental effect upon life, property or critical infrastructure.

Annex G Sandbag policy

Operational procedure

FLOOD CONTAINMENT/PREVENTION (SANDBAG POLICY)

General

In the event of a serious flooding problem affecting a large area of the Borough or a number of properties the expectation is that calls for assistance will be coordinated through the Customer Services Centre and Forestcare (out of hours). These calls will then be directed to and managed by the appropriate service area (Highways/Landscape). Service areas need to coordinate throughout any flooding incident to ensure there is an overall coordinated picture. This coordination will be facilitated via the emergency planning function and most likely with the establishment of a Corporate Severe Weather Management Team.

All requests for sandbags will be assessed in terms of priority of need and associated risk. Because the nature of local flooding tends to be as a result of the rapid onset of surface water run off the Councils ability to respond to hundreds of requests for assistance over a very limited time is extremely limited.

Priority of need

Where likely need has been identified the priority is to provide advice to the Customer Services Centre/Forestcare as to how calls are to be handled. They will normally agree to take the full details and advise the caller that these will be passed on to the officers so that they may evaluate need having regard to the circumstances and the following priorities. The caller will be advised not to assume that help will be coming. The Council will deploy sandbags with regards to the following priorities.

- To prevent loss of life or serious injury.
- Maintaining access for the emergency services.
- Protection of property occupied by a vulnerable resident (regardless of tenure) such as a housebound, frail or disabled person unable to assist themselves.
- Protecting vital facilities within the community.
- Protection of transportation routes.
- Protection of BFC property.

It is essential to recognise that BFC maintains a limited supply of sandbags which is intended to be deployed according to the above priorities. It is not able to provide a sandbag service on demand to the general public.

Other than in the circumstances outlined above BFC will not normally seek to provide sandbags to private properties. Residents and local businesses are expected to make their own provision for flood defence based on the weather forecasts and any previous local experience. The Council has no liability to provide sandbags and care must be taken to ensure that no liability is accepted.

Flooding on the highway

The Council's highways contractor, Ringway, holds only a very limited sandbag stock and will in its normal course of duties deploy sandbags intended for use on the road network to contain modest scale pollution events.

Sandbags will not ordinarily be used to prevent flooding on the road and if the network becomes flooded it will recede over time. Ringway is responsible for placing flood warning signs on the network and in extreme conditions close roads.

Flooding of other BFC owned and occupied property

Council resources will be deployed (via Landscape services) to help prevent flooding of council properties including offices, schools, libraries, leisure centres and community buildings. Landscape services may also be called upon to assist vulnerable households in the community.

Emergency planning

The Emergency Planning function is able to provide coordinating support and assistance to the above roles. Specific requests for support such as maintaining access may also be received via the emergency services. The first priority is to assess the situation and determine the likelihood of there being a need to establish the Corporate Severe Weather Management Team as outlined in the Corporate Severe Weather Plan.

Vulnerability

Discretion and judgment will be required in the deployment of sandbags which prevent loss of life or serious injury, protection of transportation routes and vital facilities within the community. Deployment will be considered at the time of need, giving due regard to the extent and duration of event, protection of the vulnerable, previous flooding history, and health and safety of the teams making deliveries.

It is not possible to provide an exact definition of vulnerable but circumstances such as medical conditions, disabilities, age, and pregnancy may make an individual more vulnerable. Requests for assistance will be made to the Council via the Customer Services Centre and Forestcare, and where there is uncertainty as to whether a person is vulnerable this information should be passed to the Severe Weather Management Team/Emergency Planning Function for decision. It may be necessary to liaise with other service areas colleagues in making this assessment.

Resources and manpower

Stocks of ready filled and empty sandbags are located at the Depot. Landscape services are responsible for ensuring that stock levels are maintained and available for use.

In the event of need to deploy/restock then manpower resources can be called upon from Landscape Services. No formal callout/standby arrangements are in place out of hours, therefore a telephone call must be made to the Landscape Manager to determine possible staffing resources and timescales of availability.

Mutual aid arrangements

In the event of urgent need then under the Berkshire emergency planning mutual aid memorandum other Berkshire local authorities may be able to assist if it is a localised event or they have additional capacity – contact can be made via the Emergency Planning Function. BFC may also receive a request for mutual aid, depending upon the numbers required this decision must be made by the Severe Weather Management Team. Above all consideration should be given to the needs of BFC as a priority.

Where BFC provides sandbags, they become the responsibility of the person receiving them. BFC cannot accept responsibility for putting the bags in place (although this should be determined at the time of need, e.g. if there are elderly tenants) or for disposing of them after flooding recedes, although in exceptional circumstances this view will be reconsidered.

Forward planning

Consideration should be given by all BFC site managers as to the local risk of flooding and previous experience and, wherever possible, sandbags should be deployed in advance when the risk is considered high. Under such circumstances stock can be drawn from the corporate store.

Annex H: SEA/HRA summary

To be completed

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Nepali

यस प्रचारको सक्षेपं वा सार निचोड चाहिं दिइने छ ठूलो अक्षरमा, ब्रेल वा क्यासेट सूनको लागी । अरु भाषाको नक्कल पनि हासिल गर्न सकिने छ । कृपया सम्पर्क गनुहोला ०१३४४ ३५२००० ।

Tagalog

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Urdu

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Polish

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