Local Flood Risk Management Strategy

London Borough of Bexley



Date of last review: March 2017

Executive Summary

The Local Flood Risk Management Strategy sets out how flood risk is managed in Bexley, who is responsible for water from different sources and presents an action plan to reduce flood risk. It has been produced as part of the requirements of the Flood and Water Management Act 2010. Within the legislation the London Borough of Bexley has been made a Lead Local Flood Authority. This means that it is responsible for overseeing the strategic management of flooding from:

- Surface Water Flooding
- Ground Water Flooding
- Ordinary Watercourse Flooding

The strategy sets out Bexley's key priorities in managing flood risk, how it will work with its partners and also gives trigger levels for flood risk processes. It is intended to be a living document that will be revised every six years to take into account updates in legislation and changes to flood risk within the borough. This summary contains the key points from each section of the main document, highlighting what information is contained within and where users might find the information they require.

Introduction

Work to manage flooding requires cooperation between an array of people and organisations. It is supported by wide range legislation and policies. Within this strategy, responsibility for managing different sources of flooding are clearly stated, providing a starting point for whom to contact to resolve problems. Bexley Council has set several aims to help reduce the risk of flooding in the borough which are:

1. Improve knowledge of flooding within the London Borough of Bexley
2. Reduce flood risk within the Borough
3. Reduce the impact of flooding within the Borough

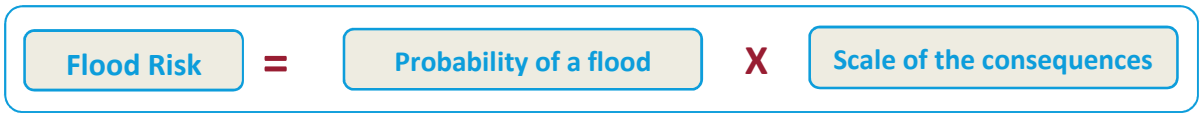
To achieve these aims the Council will work with neighbouring boroughs, the Environment Agency and Thames Water as part of the South East London Flood Risk Management Partnership to deliver the strategy and action plan.

Local Flood Risk

Flooding is defined as when '*land not normally covered by water becomes covered by water*'. In Bexley this can be from a variety of sources such as ground water, surface water, sewer flooding and river flooding. A lot of work has gone into understanding the risk of flooding across the borough including:

- Engagement with residents (particularly those affected by flooding)
- Flood Modelling (producing maps of areas at risk of flooding)
- Recording historic flooding (both observed and reported flooding)
- Flood Risk Assessments (Preliminary Flood Risk Assessment, Strategic Flood Risk Assessment, Surface Water Management Plan)
- Working with partner organisations (including Thames Water and Environment Agency)

When we talk about flood risk we look at the likelihood and consequence of flooding to establish how serious it could be. As such, high flood risk can be a very rare event with severe consequences or very frequent flooding which has limited impact.



Surface water is the largest risk of flooding in the borough with 13,000 properties at low risk and 660 at high risk. River flooding accounts for 40 Properties at high risk of flooding and 10,000 at low risk of flooding.

Roles and Responsibilities

Everyone has a role to play in reducing flood risk and it cannot be the sole responsibility of one organisation. Different organisations lead on distinct types of flood risk. These organisations are considered Risk Management Authorities. This section details their responsibilities with particular focus on the duties and powers of Bexley Council.

Set out in Table 1 are the Risk Management Authorities responsible for the strategic management of risk from the different sources of flooding. Each of the bodies have a duty to work together to reduce flood risk because often water can come from several sources. Each body can also take on the risk management functions of another RMA where both parties agree and all RMA's have a duty to be subject to scrutiny from the Lead Local Flood Authority's scrutiny process.

London Borough of Bexley		
	Surface Water Flooding	Flooding from heavy rains which run off the land causing flooding where it pools in low lying areas.
	Ground Water Flooding	Flooding where the water table rises above the level of the ground causing prolonged flooding. Normally this only follows long periods of heavy rain over weeks.
	Ordinary Watercourse Flooding	This is where small watercourses (streams and brooks), which are not Main River, come out of channel flooding the adjacent land.
	Reservoir Flooding	Flooding resulting from overtopping or failure of a dam or reservoir. Local Authorities must maintain a register of reservoirs in the borough, and in some cases are responsible for their maintenance. The London Borough of Bexley is responsible for Danson Dam.
Environment Agency		
	Main River Flooding	Flooding from watercourses which have been designated Main River.
	Coastal/Tidal Flooding	Flooding as a result of flooding from the sea or tidal rivers (such as the Thames).
	Reservoir Flooding	Flooding resulting from overtopping or failure of a dam or reservoir.
Thames Water		
	Public and Foul Sewer Flooding	Flooding that occurs from surface water or foul sewers not coping with volumes of water in the pipes.
Highway Authority		
	Sewer flooding from highway drains	Flooding occurring from drains which only capture water from the highway.

Table 1: Risk Management Authority responsibilities

Some land owners will have responsibilities where ditches and watercourses run through or next to their land. The land owner is responsible for maintenance of the watercourse to the middle of the channel. For more detailed information please see the Environment Agency booklet, 'Living on the Edge'.

Bexley Council Responsibilities

As lead local flood authority Bexley have a range of powers and duties. In exercising these functions Bexley must aim to make a contribution to achieve sustainable development.

1. *Duty to cooperate with other risk management authorities*. All risk management authorities are required to cooperate so that flooding is managed effectively.
2. *Duty to investigate flooding which is deemed necessary and appropriate.* Where 5 or more properties flood internally in one event or if 1 or more properties flood internally 3 times in 5 years an investigation will be carried out, which will then be published. The council may investigate in other situations as well.
3. *Duty to maintain a register of structures and features that are likely to have a significant effect on flood risk*. This duty ensures that features of the environment (walls, ditches, culverts) that help to reduce flood risk are known.
4. *Duty to consent to changes to ordinary watercourses that affect flow or flood risk.* This duty ensures that developments affecting watercourses do not make flood risk worse. Enforcement is possible where changes have been made without consent.
5. *Power to designate features and structures where they have an impact on flood risk.* This power can be used to ensure that infrastructure is protected from change where it is important for flood risk management. Changes to designated features require consent from the Lead Local Flood Authority.
6. *Power to carry out flood risk management works*. This allows works to be completed to help manage flood risk, or maintain existing defences.
7. *Power to request information in connection with Bexley's risk management functions*. This helps Bexley better understand flood risk. Information can be requested from any person or organisation.
8. *The Council is a statutory consultee for major planning applications*. Sustainable drainage systems (SuDS) are now expected in all developments and are mandatory for large developments (unless it is demonstrated as inappropriate). Through SuDS, water quality can be improved and flood risk reduced. The long term goal is for all sites to only discharge the same amount of water that would run off the site if it was a green field.
9. *Under the Civil Contingencies Act the council is a category 1 responder*. Meaning that Bexley play a lead role in response and recovery both during and following a flood. Further information is available on Bexley's website.

For more details on any of these responsibilities please look within the main document.

Objectives and Measures

Local strategies must take into account the National Flood and Coastal Erosion Risk Management Strategy, written by the Environment Agency. The key objective of both strategies is to reduce the risk of flooding. In addition three core objectives have been identified in Bexley's Local Strategy. These are in line with the corporate priorities of the Council.

- Grow a thriving community
    - Improve community understanding of local flood risk so they can take action to reduce the risk to themselves and their property
    - Reduce risk of flooding across the Borough and manage the residual risk, reducing the damage and disruption caused by flooding
    - Manage development to ensure flood risk is not increased, and opportunities are taken to reduce flood risk through well planned and designed developments

- Living long, fulfilling and independent lives
    - Ensure flood risk works are designed to achieve multiple benefits and enhance the location by adding amenity and biodiversity value
- Providing value for money
    - Take opportunities to apply for external flood risk funding, and use any funds in the most efficient way to reduce flood risk.

These three objectives will be delivered through the action plan, which is in Appendix B. This contains the plans and projects which will deliver the aims and objectives of this strategy. They include modelling, community awareness, managing development and improving drainage where possible. In all our schemes we look at additional benefits to the environment and improving the quality of water entering watercourses.

Funding and Delivery

Delivery of the action plan, and therefore the objectives and aims of this strategy, is highly dependent on the availability of funding, which changes over time. Projects often begin with limited information such as historic evidence of flooding and number of houses potentially affected by flooding. Funding is based on the benefits of a scheme (for example properties protected) against the cost of the scheme. Where schemes involve partnership working (often in conjunction with the Environment Agency and Thames Water), provide environmental benefits and help vulnerable people, they achieve a higher priority. The Council prioritises flooding schemes depending on the frequency and impact of the flooding, generally ranked by:

1. Internal property flooding
2. Highway flooding near shopping centres / important infrastructure
3. Highway flooding generally
4. Garden and open space flooding.

To ensure the council can access as much funding as possible, schemes and plans are proposed and put forward with the best information available. Often a phased approach allows small amounts of funding to be unlocked to improve the understanding of flood risk and ensure that the most appropriate, cost effective, schemes are delivered.

The main sources of funding are:

- Grant in Aid – Administered by the Environment Agency, this funding is available to schemes which reduce the risk of flooding to properties. It promotes working in partnership and gives greater weighting to schemes located where there is deprivation. Funds are bid for in a national programme
- Capital Project Funds – Schemes paid for by the council
- Local Levy – Funding from a joint pot of money, to which all lead local flood authorities and the Environment Agency contribute
- Community Infrastructure Levy – Funding which new developments may provide to improve infrastructure including flooding works.

For more sources of funding please see the main document.

Foreword

We made preparations to establish our Local Flood Risk management strategy at a time of prolonged rainfall and storms, when there was widespread public concern over the consequences of flooding from a variety of different sources. Many of our residents have been affected either directly or indirectly by flooding in recent years and December 2013 to January 2014 was the wettest two month period on record in the South London area. The prolonged heavy rainfall during that period caused groundwater to rise to exceptionally high levels which led to significant flooding in Kent and a number of South London boroughs. South East London continued to experience flooding throughout 2014 with some residents remaining out of their homes for many months as a result.

If this experience has taught us anything it is that we cannot underestimate the impact of flooding on our health, our prosperity and our wellbeing. It has also demonstrated that flood risk is not a problem that one local authority or one government department can manage alone.

To address these serious consequences we have developed the Bexley Local Flood Risk Management Strategy to set out the specific steps we will take over the next six years and beyond to realise our flood risk management duties and responsibilities. We also work in close partnership with the London Boroughs of Bromley, Lewisham, and the Royal Borough of Greenwich along with other organisations such as the Environment Agency and Thames Water as part of the South East London Flood Risk Management Partnership. By working together in this way we will share our collective experience and expertise in managing flood risk and work with residents and businesses to capture local knowledge and provide residents with information and tools to help them manage their own flood risk to the best of their ability.

Our Strategy is prepared at a time of unprecedented pressures to reduce public spending and so it is essential we identify the best value priorities to be actioned. To achieve best value we will work with different departments across the councils and partner organisations so that flood risk benefits are included in all possible projects, helping to reduce the impact that flooding has on the lives of our residents and businesses. We will work together to make best use of the resources we have and to identify new resources we can use in this collective challenge. Our Strategy is vital to the successful management of all sources of flood risk.

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1 Introduction

1.1 Background

Following the devastating floods of 2007 the Government, with the support of all political parties, commissioned Sir Michael Pitt to review what happened in the summer of 2007 and identify what could be done in the future to reduce the risk and impact of flooding on communities across the country. The Pitt Review[1] made 92 recommendations, many of which were translated into primary legislation through the Flood and Water Management Act (FWMA), introduced in April 2010. Also at this time the government introduced the Flood Risk Regulations (FRRs) 2009 to transpose the EU Floods Directive 2007 into English and Welsh law. Under this new legislation the London Borough of Bexley, like all London Boroughs, became established as a Lead Local Flood Authority (LLFA). As a LLFA we were given new roles, responsibilities, duties and powers to enable us to manage flood risk from localised sources across our Borough. A key component in delivering improved management is our duty to develop, maintain, apply, and monitor a strategy for local flood risk management that encompasses all sources of flooding. This document describes our commitment in working to address local flood risk and provides a framework for how local flood risk will be managed.

1.2 What are we doing to address the risk?

The overall aim of this strategy is to:

- Improve knowledge of flooding within the London Borough of Bexley
- Reduce flood risk within the Borough
- Reduce the impact of flooding within the Borough.

To manage flood risk we will:

- Prepare and publish the Local Flood Risk Management Strategy (Local Strategy) for the London Borough of Bexley with an action plan of measures that will be reviewed annually
- Work with other boroughs from the South East London Flood Risk Management Partnership to prepare and establish the South East London Local Flood Risk Management Strategy (here after known as the South East London Strategy)
- Work in partnership with other Risk Management Authorities (RMAs).

The London Borough of Bexley is working as part of the South East London Flood Risk Management Partnership to manage local flood risk and fulfil our duties and responsibilities under the Flood Risk Regulations 2009 and the Flood and Water Management Act 2010. The four boroughs and Lead Local Flood Authorities within the Partnership are:

- London Borough of Bexley
- London Borough of Bromley

[1] https://webarchive.nationalarchives.gov.uk

- Royal Borough of Greenwich
- London Borough of Lewisham

These four Lead Local Flood Authorities started working together as part of the Drain London Programme in 2010 to prepare Surface Water Management Plans and Preliminary Flood Risk Assessments. It was agreed that the group be formalised and as such the South East London Flood Risk Management Partnership ("The Partnership") was formed. The Partnership meets every quarter and is made up of the following members:

- Representative from Thames Regional Flood and Coastal Committees (RFCC)
- Representative from Southern RFCC
- Lead Councillors from each borough
- Officers from each borough
- Environment Agency officers
- Thames Water officers.

1.3 What is the Local Flood Risk Management Strategy?

The Local Flood Risk Management Strategy is a document which sets out how we as a Lead Local Flood Authority (LLFA) are responding to the identified flood risk across our borough.

Our strategy specifies;

a. the risk management authorities in the authority's area,
b. the flood and coastal erosion risk management functions that may be exercised by those authorities in relation to the area,
c. our objectives for managing local flood risk (including any objectives included in the authority's flood risk management plan prepared in accordance with the Flood Risk Regulations 2009),
d. the measures proposed to achieve those objectives,
e. how and when the measures are expected to be implemented,
f. the costs and benefits of those measures, and how they are to be paid for,
g. the assessment of local flood risk for the purpose of the strategy,
h. how and when the strategy is to be reviewed, and
i. how the strategy contributes to the achievement of wider environmental objectives.

1.4 Structure of the Local Strategy

The boroughs of the partnership will prepare a South East London Strategy to describe their common aims and objectives, their shared approach to flood risk management and their commitment to partnership working. We have produced our own individual borough level Local Strategy (this document) to set out our borough specific objectives, concerns and individual action plans.

1.5 Legislative and Policy Context

Table 1 sets out some of the key legislation that provides the current context to the Strategy, these are a combination of European, National, Regional, and Local legislative documents; of particular relevance are the Flood Risk Regulations and the Flood and Water Management Act.

Table 1 Legislative and Policy Context for Local Flood Risk Management Strategy

Legislation	
Flood and Water Management Act (2010)	The Flood & Water Management Act (FWMA) makes provision for better, more sustainable management of flood risk and establishes strategic responsibility in managing flood risk. The FWMA establishes the role of the Council as a Lead Local Flood Authority (LLFA) and sets out a range of powers and responsibilities for the LLFA (and others), such as the duty on all flood risk management authorities to co-operate with each other, and provides Lead Local Flood Authorities (LLFA) and the Environment Agency with a power to request information required in connection with their flood risk management functions. Section 9 of the FWMA requires LLFAs to develop, maintain, apply and monitor a strategy for local flood risk management in its area. This document is the Local Flood Risk Management Strategy.
Flood Risk Regulations (2009) and EU Floods Directive (2007)	The Flood Risk Regulations (FRR) transposed the European Union (EU) Floods Directive into English and Welsh Law. The purpose of the Floods Directive is to establish a framework for assessing and managing flood risk, aimed at reducing the negative impact of flooding on human health, the environment, cultural heritage and economic activity across the European Community. The Directive was developed in response to a number of extreme flooding events suffered across the EU and aims to establish effective cross-border flood risk management to address this. The Directive required Member States to first carry out a preliminary assessment by 2011 to identify the river basins and associated coastal areas at risk of flooding. These are defined as "Flood Risk Areas" in the FRR. For such zones flood risk maps needed to be drawn up by 2013 and flood risk management plans focusing on prevention, protection and preparedness by 2015. The Directive applies to inland waters as well as all coastal waters across the whole territory of the EU. Greater London was identified as a Flood Risk Area on the basis of the national data (England and Wales) prepared by the Environment Agency. Consequently the area requires a Flood Risk Management Plan (as defined in the FRR).
The Land Drainage Act (1991 and amended in 1994)	The Land Drainage Act 1991 requires that a watercourse be maintained by its owner in such a condition that the free flow of water is not impeded. The riparian owner must accept the natural flow from upstream but need not carry out work to cater for increased flows resulting from some types of works carried out upstream, for example a new housing development. If a riparian owner fails to carry out his responsibilities under the Land Drainage Act, or if anyone else causes a watercourse to become blocked or obstructed, the Council have powers of enforcement by serving a notice under the Act. If this is ignored, the Council concerned may carry out the necessary work itself and then recharge the person responsible for the full cost incurred. The 1994 Act amends the Land Drainage Act of 1991 in relation to the functions of internal drainage boards and local authorities.
Water Resources Act (1991)	This Act aims to prevent and minimise the pollution of water. The policing of this act is the responsibility of the Environment Agency. Under the act it is an offence to cause or knowingly permit any poisonous, noxious or polluting material, or any solid waste to enter any controlled water. Silt and soil from eroded areas are included in the definition of polluting material. If eroded soil is found to be polluting a water body or watercourse, the Environment Agency may prevent or clear up the pollution, and recover the damages from the landowner or responsible person.
EU Water Framework Directive (2000)	This Directive sets out to establish a Community framework for the protection of surface waters and groundwater across the EU. It aims to provide a common approach with common objectives, principles and basic measures designed to prevent any further deterioration of surface and ground waters and to protect and enhance the quality and quantity of aquatic eco-systems and, with regard to their water needs, terrestrial systems.

Strategic Environmental Assessment Directive (2001)	The Strategic Environmental Assessment (SEA) Directive applies to a wide range of public plans and programmes (e.g. on land use, transport, energy, waste, agriculture, etc.) that can produce environment effects. An SEA is mandatory for plans/programmes which: • Are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste/ water management, telecommunications, tourism, town & country planning or land use and which set the framework for future development consent of projects listed in the EIA Directive. OR • Have been determined to require an assessment under the Habitats Directive. Broadly speaking, for the plans/programmes not included above, the Member States have to carry out a screening procedure to determine whether the plans/programmes are likely to have significant environmental effects. If there are significant effects, an SEA is needed. The screening procedure is based on criteria set out in Annex II of the Directive.
Civil Contingencies Act (2004)	The Civil Contingencies Act established a new legislative framework for civil protection in the United Kingdom. It imposes a clear set of roles and responsibilities on those organisations with a role to play in preparing for and responding to emergencies. Local authorities are a Category 1 responder under the Act, and have a key role to play in respect of discharging their duties under the legislation. The Act, and accompanying Regulations and guidance, delivers a single framework for civil protection in the United Kingdom capable of meeting the challenges of the twenty first century.
Climate Change Act (2008)	The Climate Change Act sets up a framework for the UK to achieve its long-term goals of reducing greenhouse gas emissions and to ensure steps are taken towards adapting to the impact of climate change. Its main elements are: • Setting emissions reduction targets in statute and carbon budgeting • A new reporting framework • The creation of an independent advisory body • Adaptation • Policy measures which reduce emissions. The Act will be used to support emissions reductions through several specific policy measures: • Amendments to improve the operation of the Renewable Transport Fuel Obligations • A power to introduce charges for single use carrier bags • A power to pilot local authority incentive schemes to encourage household waste minimisation and recycling • Amendments relating to the Certified Emissions Reductions Scheme • Powers and duties relating to the reporting of emissions by companies and other persons • A duty to make annual reports on the efficiency and contribution to sustainability of buildings on the civil estate.
Conservation of Habitats and Species Regulations (2010)	The objective of the Habitats Directive is to protect biodiversity through the conservation of natural habitats and species of wild fauna and flora. The Directive lays down rules for the protection, management and exploitation of such habitats and species. The Habitats Regulations transpose the Habitats Directive in England, Wales and to a limited extent Scotland by ensuring that activities are carried out in accordance with the requirements of the Directive.
The Localism Act (2011)	The Localism Act contains a wide range of measures to devolve more powers to councils and neighbourhoods and give local communities greater control over local decisions like housing and planning.
Bexley Local Plan	The Core Strategy 2012 sets out a spatial planning framework for the borough until 2026, with a focus on promoting the principles of sustainable development. The Core Strategy is Bexley's main development plan document. In 2012 following the adoption of the Core Strategy 137 policies were saved in full and two in part, from Bexley's Unitary Development Plan (UDP) 2004.

National Planning Policy Framework (2012)	The National Planning Policy Framework sets out the Government's planning policies for England and how these are expected to be applied. It provides a framework within which local people and their accountable councils can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities.
The London Plan 2016 (consolidated with alterations since 2011)	The London Plan is the overall strategic plan for London. The strategy sets out an integrated economic, environmental, transport and social framework for the development of the capital to 2036. It forms part of the development plan for Greater London. London boroughs' local plans need to be in general conformity with the London Plan, and its policies guide decisions on planning applications by councils and the Mayor.
The Water Act (2014)	The Water Act enables, for the first time, businesses, charities and public sector customers to have the freedom to switch supplier from 2017. The Act aims to: • Address growing pressure on water resources by making supply more resilient; • Help join up the national water network, by making it easier for water companies to buy and sell water from each other; • Increase competition and encourage new entrants to the market who can offer alternative sources of water or innovative ways of treating sewerage; and • Ensure that households in the highest flood risk areas will be able to access affordable flood insurance from 2015.

1.6 Related Documents

There are many documents which need to be read and considered in conjunction with our Local Strategy. Some of these are set out below. This list is far from exhaustive and focuses on the documents that are most often used by the LLFA.

- Bexley Preliminary Flood Risk Assessment[2]
- Bexley Strategic Flood Risk Assessment, Level 1 and 2
- Bexley Core Strategy
- Bexley Multi-Agency Flood Plan
- Bexley Surface Water Management Plan (Draft)
- Bexley Sites of Importance for Nature Conservation
- Bexley Growth Strategy Direction of Travel
- Cray and Shuttle Catchment Plans
- Thames Estuary Plan 2100 (2012)
- Thames River Basin District Management Plan
- Thames Catchment Flood Management Plan
- North Kent Rivers Catchment Flood Management Plan
- National Flood and Coastal Erosion Risk Management Strategy for England
- Thames River Basin Flood Risk Management Plan

[2] If this link does not work for you, copy and paste the following link into your browser - http://webarchive.nationalarchives.gov.uk/20140328084622/http:/www.environment-agency.gov.uk/research/planning/135542.aspx#3

2 Local Flood Risk

2.1 What is a Flood?

A flood is formally defined in the Flood and Water Management Act as including any case

> *"[…] where land not normally covered by water becomes covered by water."*

Flooding can be caused by a range of sources including heavy rainfall, rivers overflowing or its banks being breached, dams overflowing or being breached, tidal waters, or groundwater. A flood does not include excess waters from any part of the sewerage system unless it is wholly or partially caused by an increase in the volume of rainwater (including snow and other precipitation) entering or otherwise affecting the system; nor does it include flooding caused by a burst water main (since these events are the responsibility of Thames Water).

In the context of a Local Strategy 'Local flooding' originates from surface runoff, groundwater and ordinary watercourse sources.

2.2 What is Flood Risk?

Flood risk can be described as the combination of the statistical probability of a flood occurring and the scale of its potential consequences. It is possible to define flood risk as:

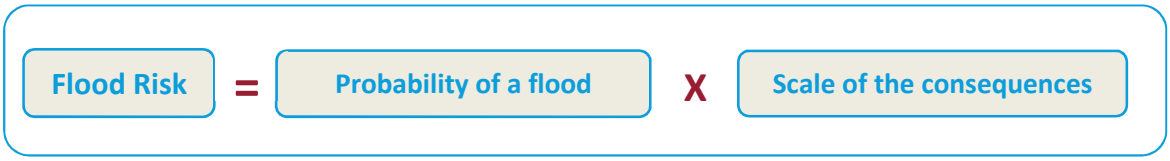


Figure 1 What is flood risk?

Using this definition it can be seen that

- Increasing the probability or chance of a flood being experienced increases the flood risk. In situations where the probability of a flood being experienced increases gradually over time, for example due to the effects of climate change, then the magnitude of the flood risk will increase.
- The severity of the consequences can increase the flood risk. This can be due to the flood hazard magnitude (depth and velocity of water), the presence of multiple receptors, the vulnerability of those receptors (for example old or young people), or a combination of all three.

2.3 Local flood risk in the London Borough of Bexley

The Borough is affected by multiple sources of flood risk including tidal, fluvial, surface water (pluvial), groundwater and reservoir flooding.

The tidal flood risk affects land along the Borough's Thames frontage, up the Dartford Creek (River Darent) and along the River Cray to their tidal limits. Some of the smaller creeks, dykes and surface water sewers that outfall to the Thames directly can also be affected by tidal conditions in the Thames, Darent and Cray. However, it should be noted that the Thames frontage benefits from raised tidal defences and the Dartford Creek and River Cray are defended by the Dartford Creek

Tidal Barrier. The existing defences provide a substantive standard of protection to a large proportion of the properties shown to be at some level of risk from either tidal or fluvial flooding.

The tidal floodplain is characterised by the low lying densely populated areas of Thamesmead, Belvedere, Erith and Slade Green set against undeveloped marsh land. The area includes riverside commercial land, industrial land uses including the Crossness sewerage treatment work, Belvedere waste incinerator and the main line railway.

Additionally the Borough is at risk from fluvial flooding from the River Cray, the River Shuttle and other tributaries (for example, the Wyncham Stream). These watercourses are characterised by their steep, relatively urbanised channels with flows and water levels that respond rapidly to rainfall. The River Shuttle has been categorised as a high risk rapid response catchment and much of its narrow floodplain is developed including the residential areas of Blackfen, Sidcup and Bexley. The Cray rises in Bromley and flows through the more industrialised areas of Foots Cray where it opens up into water meadows. It eventually flows through the built up area of Crayford, where the town centre and industrial estates lie in the bottom of the valley, placing them most at risk of flooding. The Rivers Cray and Shuttle have some flood defence measures including channel conveyance improvements and flood storage areas that were built in the 1980s.

There are over 10,000 properties at low risk of river flooding within the Borough that are generally situated behind the tidal defences and have a small residual flood risk during events that exceed the design capacity of the defences or are caused by a failure of the defences. However, according to the National Flood Risk Assessment data around 40 properties remain at high risk of river flooding across the borough. These are largely grouped along the River Shuttle in the Blackfen and Lamorbey Ward, and Blendon and Penhill Ward.

Due to the extent of Urbanisation in the borough there is also risk of flooding from surface water. At present there are over 13,000 properties at low risk in the Borough, and around 660 at high risk. Due to its nature, this type of flood risk is much more spatially diverse than flooding from rivers and occurs in small pockets around the borough.

The reservoir in Danson Park presents a potential risk of flooding during an event where the dam is overtopped or there is a sudden failure of the land retaining the water. The chances of such a catastrophic event are very low, but the consequences are very significant and so the risk must be considered. Works to improve the stability of the dam face were completed in 2016, and the reservoir is subject to annual review.

2.4 Historic Flooding

We have developed our Preliminary Flood Risk Assessment (PFRA) to address the requirement of the Flood Risk Regulations (further information on this is given in Section 3.1.1). Our PFRA sets out historic flooding across the Borough, along with an assessment of future risk. This information has not been repeated in our Strategy

and reference should be made to the Borough's PFRA[3]. However, the following discussion of some noteworthy flood incidents has been included to give context to the scale of flood risk within the Borough.

Notable occurrences of flooding in the borough were recorded in 1897, 1953, 1958, 1968, 1977, 1979, 2005, 2009 and winter 2013/14. A breach of the tidal flood defence in 1953 caused extensive flooding from the Thames affecting Belvedere and Thamesmead. While the greatest consequences of flooding are posed by tidal flooding, the more frequent causes of flooding in the borough are the result of surface water drainage networks becoming overwhelmed by very heavy rainfall and fluvial flooding from the River Cray, the River Shuttle and the Wyncham Stream. The most significant fluvial event was in 1977 which caused extensive flooding to Crayford and old Bexley.

The Council maintains a comprehensive database of records of past flooding events which contains 3500+ entries from all sources of flood risk within the Borough. These have been used to support the identification of areas at highest risk and to prioritise flood mitigation schemes based on the frequency and severity of inundation experienced. Records of historic flooding are spread throughout the Borough. The area around the Upper Bedon Stream (Riverdale Road, Church Road, Pembroke Road and Battle Road) as well as Aperfield Road / Reddy Road are highlighted within the PFRA due to their history of flooding.

The winter of 2013-14 was a significant flood event across the borough as well as many other parts of South and East England. The current PFRA was prepared before this event and so these observations of flooding are not included. The event was caused by prolonged and extreme rainfall during the wettest December to January period in the UK since records began and the wettest two month period on record in South London. This resulted in pluvial and fluvial flooding along with ground water rising to exceptionally high levels, leading to prolonged flooding events in places. During this event the London Borough of Bexley, along with many other local authorities and partner agencies, worked around the clock to support residents and attempt to mitigate further flooding resulting from these sources.

Groundwater levels in the south east of London, as measured by borehole readings, indicated that a delayed reaction was experienced in some locations as groundwater flowed through the underlying chalk layers north towards the Thames. This was illustrated by the Boroughs of Bromley and Bexley continuing to experience flooding caused by emerging groundwater in March and April 2014, which followed on from the initial groundwater flooding events experienced in Croydon and Bromley during February and March 2014.

During the 2014 groundwater flooding event Croydon Council declared a Major Incident and, alongside other measures, established a local groundwater "Solution Cell" to monitor the situation in Croydon and neighbouring boroughs. As the raised

[3] If this link does not work for you, copy and paste the following link into your browser - http://webarchive.nationalarchives.gov.uk/20140328084622/http:/www.environment-agency.gov.uk/research/planning/135542.aspx#3

levels of groundwater were predicted to travel north east towards the Thames, the "Solution Cell" was expanded to a five borough group (Croydon, Bexley, Bromley, Greenwich and Sutton). The five-borough "Solution Cell" continued to investigate and develop medium to long-term measures for managing ground and surface water flooding, resulting in the production of a Groundwater Operational Handbook to capture lessons learnt and information that would aid response to future events. Groundwater levels are consistently monitored, and the "Solution Cell" will reform when and if necessary. The handbook helps to establish a consistent approach to the issue across South East London and deliver tangible, effective outcomes for the communities in the boroughs concerned.

Appendix E contains maps covering Bexley's historic flood incidents based on a number of sources.

2.5 Future Risk of Flooding

Appendix E contains maps covering Bexley's flood risk by source based on predictive modelling. These may include areas that have not previously experienced flooding or flooding of the magnitude shown. It is important to highlight that just because an area hasn't flooded yet doesn't mean it will never flood in the future. It may be that the particular circumstances that would cause an area to flood haven't been realised within the period on record, however, there is still a chance that flooding will be experienced in the future. We will record instances of flooding and "near misses" to inform and improve our understanding of flood risk and flood mechanisms that affect the Borough. The more we know, the more effectively we can manage risk into the future. We learn from every flood event and every "near-miss".

Local residents can and are required to play a key role in reducing the risk of flooding from urban creep, under the Town and Country Planning (General Permitted Development) Order 2008. Hard surfacing of any area greater than $5m^2$ must be made of porous material, or provision must be made to direct any run-off from that surface to a permeable area within the curtilage of the property; otherwise planning permission must be sought. This reduces the volumes of water reaching the drainage systems and is a legal requirement.

We have experienced severe flooding in the past and whilst much work has been undertaken by ourselves, our partners and others, the risk of flooding will continue into the future. In fact the probability of flooding is likely to increase in the future as a result of factors such as:

- Climate Change (increased storminess / rainfall intensity)
- Urban Creep (infill development and loss of green space, including the paving over of gardens)
- Ageing Infrastructure (increased pressure on drainage systems and other infrastructure designed for a different climate and patterns of use, and in a deteriorating condition)
- Population Growth (denser populations mean the impact of a flood for a given area will impact more people).

2.6 Future Mitigation

We will continue to work with our partners to improve understanding and deliver mitigation of flood risk into the future and will also continue to contribute to key mitigation projects such as the Cray Catchment Improvement Plan. A key outcome

of our LFRMS is our Action Plan, which sets out what we are planning to do to manage flood risk over the next 6 years and beyond. Our Action Plan is subject to review annually to take into account a number of factors that will influence the prioritisation of tasks, including records of flooding on our flood incident database and available funding. A key factor affecting our ability to realise our plans will be the availability of flood risk management funding. Our proposed approach to funding of flood risk management is discussed further in Section 5.

3 Roles and Responsibilities

3.1 Lead Local Flood Authority Powers and Duties

As a Lead Local Flood Authority (LLFA) we have a number of roles and responsibilities under the Flood Risk Regulations 2009 (FRR) and the Flood and Water Management Act 2010 (FWMA). The ways in which we are working to respond to these new challenges both individually and in partnership across the South East London boroughs are discussed below.

3.1.1 Preliminary Flood Risk Assessment (PFRA)

We have produced our PFRA, published in 2010, in accordance with the Flood Risk Regulations. We developed this document in co-ordination with other South East London Boroughs and the Drain London forum to ensure a consistent approach. We will review this document prior to June 2017 (as specified by the FRR).

3.1.2 Flood Risk Management Plan (FRMP)

Under the Flood Risk Regulations 2009, Flood Risk Management Plans (FRMP) need to be published by all areas that fall within a flood risk area (as identified within Preliminary Flood Risk Assessments). Bexley falls within the Thames River Basin District, a flood risk area, so contributed to the FRMP that was collated and edited by the Environment Agency. The Action Plan accompanying this Strategy was consulted upon in late 2015 so that actions from it could be included within the FRMP. The Thames River Basin District Flood Risk Management Plan was published early in 2016.

3.1.3 Co-operation and Arrangements

Under Section 13 of the FWMA, LLFAs must co-operate with other relevant authorities in the exercise of their flood and coastal erosion risk management functions.

We may share information with other relevant authorities for the purpose of discharging our duty under Section 13 of the FWMA. We are exercising this responsibility through our work as part of the South East London Flood Risk Management Partnership. In working with our neighbouring LLFAs and maintaining regular contact with other relevant authorities we seek to maximise any investment in flood risk management in South East London.

3.1.4 Power to request information

Under Section 14 of the FWMA we may request a person or organisation to provide information in connection with our flood and coastal erosion risk management functions. We will work with the South East London boroughs to formulate a common approach in how we request this information from third parties. Our approach with regard to information requests will be developed on a case by case basis, and will be dependent on the nature of the party we are requesting

information from and on feedback from past information requests received from that party. Where a third party's area of operation extends beyond the borough extent, we will request this information on behalf of the group and disseminate to the other three South East London boroughs within the Partnership.

We will establish a common template for these information requests. Where a party has failed to comply with our requests we may require them to attend our Places Overview and Scrutiny Committee meetings. We will typically operate a three strikes rule where if they fail to respond to three reasonable information requests we will seek to bring parties before Overview and Scrutiny. However where failure to comply with our request for information has had a financial, safety, environmental, or reputational impact we reserve the right to refer the matter directly to our Overview and Scrutiny Committees.

3.1.5 Local Authority Investigations

Under Section 19 of the FWMA we (as a LLFA) have the duty to investigate floods in our area to the extent that we consider it necessary or appropriate. The investigation should assess which risk management authorities have relevant flood risk management functions and whether each of those risk management authorities has exercised, or is proposing to exercise, those functions in response to the flood. Upon completing a formal Flood Investigation under this duty we are required to publish the results and notify any relevant risk management authorities.

We have adopted a common standard across the four South East London boroughs that will trigger a formal Flood Investigation. The trigger level is set at 5 properties (residential or commercial) internally flooding in any one event or 1 or more properties flooding internally more than 3 times in a 5 year period. Over and above, if 5 or more gardens are flooded with risk of internal property flooding, which was only prevented by active intervention (e.g. pumps or other measures were used to protect the properties) within a Critical Drainage Area (CDA; as identified within our draft Surface Water Management Plan) or recognised flow path, this would also trigger an investigation.

Investigation triggers apply across borough boundaries within the partnership, for example if two properties flood within Bexley and seven flood within Bromley and they fall within the same CDA, catchment or flow path this will trigger an investigation. It will be agreed by the LLFA's involved who will lead on the investigation, however findings will be published by all affected LLFA's, and will also be presented at the Partnership meeting.

We reserve the right to undertake Flood Investigations at our discretion (e.g. at a lower trigger) as we deem appropriate. Moreover we will also continue to undertake informal flood investigations and monitoring / record-keeping for purposes aside from fulfilling our Section 19 responsibilities. There would be no requirement to publish the outcome of an informal Flood Investigation or monitoring / record-keeping above and beyond the Freedom of Information Act.

3.1.6 Duty to Maintain a Register

Section 21 of the FWMA requires us as LLFAs to develop and maintain a register of structures or features which, in our opinion, are likely to have a significant effect on flood risk within our area.

We currently maintain a basic Section 21 register, however we are planning on developing this further, and it will be updated as features are identified. The Register contains information about the location, ownership, and state of repair for each feature. As it is developed further we intend to use the register to include not only significant structures and features, but most drainage / flood risk assets and sustainable drainage (SuDS) features within our borough.

At this time we have no plans to make the Register of Flood Risk Features publically available on our website. However it is envisaged that the Section 21 Register will be available via existing data request mechanisms e.g. FOI requests.

We will work together with the South East London Boroughs to identify structures or assets which have the potential to affect flood risk to or from neighbouring boroughs; i.e. a trash screen in one borough that if not cleared may increase flood risk in the neighbouring authority. These structures will be listed on the neighbouring authority's register, as agreed at the quarterly Partnership meetings.

We have no plans at present to develop a shared definition of what constitutes a 'significant effect' with other members of the Partnership; however some work is being done at a London-wide level to produce a framework for assessing this. In the meantime, we will review what we define as a 'significant effect' on a case by case basis at Borough level. Our register will be maintained at an individual Borough level.

3.1.7 Consenting to Works to Ordinary Watercourses

We (as a LLFA) have the responsibility for consenting for changes to ordinary watercourses across the Borough that may affect flow or flood risk. This includes the temporary or permanent erection or alteration of any mill dam, culvert, weir, bridge or other similar obstruction to the flow of an ordinary watercourse. This requirement is in addition to any other permissions or consents that may be required for the work (e.g. planning permission).

We will respond to applications for consent within two months of receipt. Consent is not approved until the applicant has received formal notification. We will not unreasonably withhold consent, however we may refuse consent if the proposed changes have the potential to increase flood risk to people or property, either up- or downstream.

Where works have been undertaken without consent we have various enforcement options to remedy the situation.

3.1.8 Flood Risk Management Works

We (as a LLFA) have the power to carry out flood risk management work if we consider the work desirable in regard to our Local Strategy (this document), and:

a. that the purpose of the works is to manage flood risk within the Borough from surface water runoff, groundwater or an ordinary watercourse (including a lake, pond or other area of water which flows into an ordinary watercourse); or

b. that the purpose of the works is to manage flood risk within the Borough from tidal sources and is within (a), (b) or (f) from Table 2 below; or
c. The Environment Agency has consented to the work

Table 2 Definitions of Flood Risk Management Work

Flood Risk Management Work (after Section 14A(9) of the Land Drainage Act, as amended by Schedule 3 of the Flood and Water Management Act) means anything done:	
(a)	to maintain existing works (including buildings and structures) including cleansing, repairing or otherwise maintaining the efficiency of an existing watercourse or drainage work;
(b)	to operate existing works (such as sluice gates or pumps);
(c)	to improve existing works (including buildings or structures) including anything done to deepen, widen, straighten or otherwise improve an existing watercourse, to remove or alter mill dams, weirs or other obstructions to watercourses, or to raise, widen or otherwise improve a drainage work;
(d)	to construct or repair new works (including buildings, structures, watercourses, drainage works and machinery);
(e)	for the purpose of maintaining or restoring natural processes;
(f)	to monitor, investigate or survey a location or a natural process;
(g)	to reduce or increase the level of water in a place;
(h)	to alter or remove works.

3.1.9 Sustainable Development

Section 27 of the FWMA requires that in exercising a flood or coastal erosion risk management function, LLFAs must aim to make a contribution towards the achievement of sustainable development.

3.1.10 Schedule 1 Designation of Features

Under Schedule 1 of the FWMA we, as a 'Designating Authority', have powers to designate, where we consider appropriate, structures and features that affect flooding. Any future works or changes to a designated structure or feature (alteration, removal or replacement) will require approval from the Council. This is a permissive power, meaning that we have the 'power' rather than the 'duty' and are not liable for the failure to exercise this power. There are four conditions that must be satisfied to enable a structure or feature (natural or manmade) to be designated. These are:

Condition	Explanation
Condition 1	that the designating authority thinks the existence of the structure or feature affects a flood or coastal erosion (or both) risk.
Condition 2	that the designating authority has flood or coastal erosion risk management functions in respect of the risk being affected.
Condition 3	that the structure or feature is not already designated by another designating authority.
Condition 4	that the owner of the structure or feature is not a designating authority.

As with the duty to maintain a Section 21 register (Refer to Section 3.1.6), we will work together in partnership with the South East London boroughs to identify features that affect flooding in neighbouring boroughs.

We have no plans at present to develop a shared definition with our Partners of what constitutes a 'structure or feature which affects flood risk', as this will be reviewed on a case by case basis at borough level.

3.1.11 Sustainable Drainage Systems (SuDS) and the Planning Process

In April 2015 changes to the planning system were introduced that further strengthened and promoted the use of Sustainable Drainage Systems in new developments. Under these changes, SuDS are to be used for the management of run-off in all major developments (unless it can be demonstrated inappropriate), and to be designed to ensure that maintenance and operation requirements are economically proportionate. To support these changes, Lead Local Flood Authorities were made statutory consultees in the planning process.

The London Borough of Bexley expects the use of SuDS in all developments, as this is a key method of managing surface water and reducing the burden on an aging public sewer system. Well-designed SuDS, which are considered at the outset of a development, can and shall provide multiple benefits, such as

- Reduced flood risk
- Improved amenity value for local residents
- Increased biodiversity and ecological value
- Improvements in water quality
- Reductions in the urban heat island effect

3.2 Sources of flood risk

There are many different sources of flooding, all of which will affect the Borough to some extent. However, not all sources of flooding are managed by one organisation:

Source of flooding	Description	Strategic Responsibility
Surface Water or "Pluvial"	Heavy rainfall leading to overland flows that are not collected by (or the exceed the capacity of) pipes and channels. The Environment Agency, in partnership with the LLFAs, has produced the *Updated Flood Map for Surface Water* which shows locations where this sort of flooding is predicted to occur. This mapping is available to view on the Agency's website.	LLFA
Groundwater	This can be the result of a combination of complex mechanisms and further work is underway at a national level to better understand where these effects are influential. It can occur when water under the ground rises and finds a place to escape to the surface.	LLFA
River or "Fluvial"	Main River – These are generally large rivers, such as the Thames, Cray and Shuttle, and larger dykes on the marshes. Flood mapping is available on the Agency's website.	Environment Agency and Riparian Owner

	Ordinary Watercourse – These are generally the smaller rivers, streams, ditches and dykes.	LLFA and Riparian Owner
Coastal / Tidal	This is when low lying coastal or estuary areas are inundated by the sea. In locations where raised defences are present, coastal or tidal flooding may be as the result of breaching or overtopping of a sea defence.	Environment Agency
Reservoir	This is when a reservoir fails and the water it holds inundates areas downstream of the reservoir. Reservoir flood mapping is available on the Environment Agency's website, and reservoir ownership can also be sought from them.	Owner of the reservoir; Bexley has responsibility for Danson Reservoir.
Sewer	Could be caused by blockages, heavy rainfall, or a lack of capacity. When flow in the system is high and the sewer reaches maximum capacity, it can become overwhelmed.	Public sewer – Thames Water Private sewer – land owner Highway drain – Highway Authority (Bexley)

3.2.1 Riparian Ownership

The owner of land next to a watercourse is known as a Riparian Owner, and they have responsibilities to manage and maintain the river running through their land. Some of these responsibilities include:

- Maintaining river beds and banks;
- Allowing the flow of water to pass without obstruction; and
- Controlling invasive alien species such as Japanese Knotweed.

These are explained further in the publication "*Living on the edge*".

3.3 Risk Management Authorities

A number of risk management authorities (RMAs) operate across or near the London Borough of Bexley. The table below sets out their respective responsibilities under the 2010 Flood and Water Management Act. All risk management authorities have a duty co-operate with Lead Local Flood Authorities in matters of flood risk management.

Table 3 Risk Management Authorities (RMAs) operating in South East London and their responsibilities

RMA	Responsibilities under the 2010 Flood and Water Management Act
Local Council as LLFA	Responsible for strategically managing flood risk from local sources See previous section for full break down.
Environment Agency	Responsible for managing flooding from main rivers or the sea. Strategic overview for all flooding sources and coastal erosion.
Thames Water Utilities Limited	Responsible for maintaining, improving and extending their water mains and other pipes. Duty to provide and maintain a system of public sewers so that the areas they are responsible for are effectively drained.
Local Council as Highways Authority	Responsible for maintenance of all public roads. Under Highways Act 1980, responsible for provision and maintenance of highways drainage and ditches.

TfL	Responsible for maintaining any drainage and ditches associated with Red Routes in London.
Neighbouring LLFAs	Carry out duties under FWMA within their own borough boundaries.

3.4 Emergency Planning

Under the Civil Contingencies Act 2004 the London Borough of Bexley is a category 1 responder, meaning that we play a lead role in emergency planning and recovery after a flood event. As such the Borough has developed a Multi-Agency Flood Plan which aims to provide a coordinated multi-agency response framework for any incident that presents a risk of flooding. The Emergency Planners in the Borough regularly hold exercises with other emergency responders to test and improve the plan. For more information on emergency preparedness please see our website.

3.5 Development Control and Planning

The London Borough of Bexley is also a Local Planning Authority, and as such has various policies in place to ensure that development and re-development are used as opportunities to decrease flood risk. This is delivered through the Bexley Core Strategy, the Bexley Sustainable Design and Construction Guide Supplementary Planning Document, Bexley's Strategic Flood Risk Assessments, the London Plan, the National Planning Policy Framework, the Flood Risk and Coastal Change Planning Practice Guidance and the Mayor's Sustainable Design and Construction Supplementary Planning Guidance.

In April 2015 the Lead Local Flood Authority at Bexley became a statutory consultee under the planning process, with an assumption that all major developments will be drained by means of Sustainable Drainage Systems (SuDS). Bexley encourages the use of SuDS in all developments, as this is a key method of reducing both flood risk and the burden on an aging public sewer system.

In addition, the London Plan policy 5.13 requires that development proposals should utilise sustainable drainage systems (SuDS), aiming to achieve greenfield run-off rates. This helps to ensure that surface water run-off is managed as close to its source as possible in line with the drainage hierarchy (SUDS).

3.6 Partnership working and other stakeholders

We have identified the following additional groups of stakeholders who we will also work with in delivering our Local Strategy Action Plan:

- Business groups (e.g. Chamber of commerce)
- Environmental and Wildlife Groups (e.g. Thames 21, Bexley Natural Environment Forum)
- Emergency Services
- Resident's Groups and Associations (e.g. Cray Rivers Group)
- Neighbouring Local Authorities
- Statutory bodies (e.g. Natural England)
- Transport operators and authorities (e.g. Transport for London, Network Rail)
- Utility providers and operators (i.e. National Grid)
- Other Council departments

We will undertake to maintain an open, transparent and pragmatic communications approach between the Flood Risk Management (Drainage) Team and other council departments. We will continue to forge links with key stakeholders including Elected Members, community groups and river groups. We will provide a point of contact to respond to queries from members of the public and we will share this information where appropriate with the other parties via Partnership quarterly meetings and more frequently via less formal means as required (see Section 3.1.3).

We have identified the following potential beneficiaries of local flood risk management:

- Residents
- Businesses
- Insurance bodies (both domestic and commercial)
- Fishery groups and angling clubs.
- Riparian owners
- Agricultural land
- The environment
- Biodiversity

Our ability to manage flood risk is significantly enhanced if alternative sources of funding can be secured in each area to reflect the local benefits that would be delivered. Therefore we will consider who is benefitting from proposed measures when reviewing funding opportunities as outlined in Section 5 and encourage private investment in risk management in return for allowing some influence over the scope and timing of works.

3.7 How we will monitor our LFRMS

We will monitor our LFRMS through the use of Key Performance Indicators (KPIs). The Flood Risk Engineer will provide borough specific KPIs and key information to the Partnership at quarterly meetings, at which Local Strategy KPI monitoring will be a standing item on the agenda. Our KPIs are designed to be quick reference matrices that provide a 'state of the nation' overview for the South East London boroughs. They are not overly onerous, are based on readily available information and are collated by the Borough officer each quarter. The KPIs are measureable so that variance can be monitored and reviewed.

3.7.1 What are our KPIs?

Our provisional KPIs are set out in Table 4 below.

Table 4 South East London Local Strategy Key Performance Indicators

KPI ID	Metric and description
FWMA 1a	**Number of (Section 19) flood investigations undertaken.** Number of flood investigations undertaken under Section 19 of the Flood and Water Management Act 2010 in response to the trigger level being reached.
FWMA 1b	**Number of (Section 19) flood investigations published.** Number of flood investigations at or above the trigger level completed and published (including discretionary investigations if appropriate).

FWMA 2a	**Number of requests for works to ordinary watercourses received**. Number of requests for works to ordinary watercourses under Section 23 of the Land Drainage Act 1991.
FWMA 2b	**Number of ordinary watercourse consents granted.** Number of requests for works to ordinary watercourses where consent is granted.
FWMA 2c	**Number of ordinary watercourse consents refused.** Number of requests for works to ordinary watercourses where consent is refused.
FWMA 3a	**Number of structures / features added to (Section 21) register of flood risk assets.** Structures or features which, in the opinion of the authority, are likely to have a significant effect on a flood risk in its area, and a record of information about each of those structures or features, including information about ownership and state of repair recorded on the Section 21 register.
FWMA 3b	**Number of structures / features considered for (Schedule 1) 'designation'.** Designation is a form of legal protection or status reserved for certain key structures or features that are privately owned and maintained, but which make a contribution to the flood or coastal erosion risk management of the people and property at a particular location.
FWMA 3c	**Number of structures / features designated (Schedule 1).** Number of structures / features which meet the four designation conditions and for which the four stage process of designation has been completed.
FWMA 4a	**Number of actions from the Local Flood Risk Management Strategy Action Plan commenced or in progress**. The number of actions from the individual borough Local Strategy Action Plans that have been commenced. Reported against the total number of actions stated.
FWMA 4b	**Number of actions from Local Flood Risk Management Strategy Action Plan completed.** The number of actions from the individual borough Local Strategy Action Plans that have been completed. Reported against the total number of actions stated.

We will review these KPIs as part of our annual Action Plan review to ensure they are still fit for purpose. Amendments to KPIs will be formally agreed at the quarterly Partnership meetings. We will seek to keep our KPIs consistent with other borough members of the Partnership to allow benchmarking of our progress against neighbouring authorities.

3.8 How we will review our Local Strategy

We have developed our Local Strategy with the aim of reviewing the whole document every 6 years. Therefore in 2023 we will commence reviewing the success of our Local Strategy over the previous six years and use this as the platform for the next Strategy period.

We recognise that it is difficult to plan for or commit to actions six years in the future given the extent of uncertainty governing the process. It is expected that the Local Strategy will be impacted by variability in council and external budgets / funding opportunities, in response to significant flooding, in response to changes in

development pressures and plans, and in response to shifting local priorities. Therefore the Local Strategy is supported by an Action Plan which will be reviewed and as necessary updated annually (or following a significant flooding event). Any updates to the Action Plan will be agreed at Borough level and then presented at a Partnership quarterly meeting.

3.9 How have we consulted on this document

The draft Local Strategy was presented for an 8 week public consultation in late 2016. There were ten responders to the consultation, and their comments were used to refine this strategy. A response to the consultation is published is published here, and is also available as an appendix to this document.

The Local Strategy Action Plan which accompanies this document was presented for consultation in September 2015. There were twelve responders to the consultation, and their comments were used to refine the Action Plan. A response to the consultation was published, and is available as an appendix to this document.

4 Objectives and Measures

There are a number of National, Regional (Partnership wide), and Local objectives that govern the work of the Partnership and the formation of our Local Strategies. These have been set out below

4.1 National Objectives

These are set within the National Strategy (National flood and coastal erosion risk management strategy for England); the overall aim of which is to ensure the risk of flooding and coastal erosion is properly managed by using the full range of options in a co-ordinated way. The National Strategy was developed by the Environment Agency who are responsible for its maintenance, application and monitoring in accordance with the requirements of the FWMA 2010.

To be consistent with the National Strategy the following national objectives will be taken into consideration and where appropriate addressed in the management of local flood risk:

- Understanding and Working Together: Understanding the risks of flooding and coastal erosion, working together to put in place long-term plans to manage these risks and making sure that other plans take account of them;
- Development Control: Avoiding inappropriate development in areas of flood and coastal erosion risk and being careful to manage land elsewhere to avoid increasing risks;
- Reducing Risk: Maintaining and improving Flood and Coastal Erosion Risk Management (FCERM) systems to reduce the likelihood of harm to people and damage to the economy, environment and society;
- Improve Public Awareness: Building public awareness of the risk that remains and engaging with people at risk to encourage them to take action to manage the risks that they face; and
- Improved Emergency Planning and Recovery: Improving the detection, forecasting and issue of warnings of flooding, co-ordinating a rapid response to flood emergencies and promoting faster recovery from flooding.

4.2 Regional (Partnership Wide) Objectives

The underpinning regional (Partnership wide) objectives are based on the terms of reference from the South East London Partnership. They cover the four borough's objectives for their Strategy which are to:

- Develop a robust and consistent understanding of flood risk across South East London, actively sharing information where necessary;
- Establish a common understanding of each risk management authority's roles and responsibilities;
- Collaborate in the development of the Local Flood Risk Management Strategies and other legal requirements to deliver coordinated flood risk management across South East London;
- Develop and promote options for joint mitigation of flood risk across South East London to ensure that all partners are working together to reduce local flood risk;
- Ensure that there is a common overview of the resources, skills and capabilities available to manage flood risk, alongside an understanding of where the gaps exist and how available funds can best be maximised;
- Discuss issues and seek advice/guidance from other risk management authorities to ensure that there are robust links to other forums involved in flood risk at all spatial levels in order to resolve flood risk issues, shape policy and gain access to funding;
- Ensure that elected members are fully briefed as to the current progress of the Partnership, and specifically where there are projects which are likely to be put forward for funding to the Thames or Southern Regional Flood and Coastal Committees (RFCCs).

4.3 Local Objectives

Our local objectives have been developed from reviewing the overarching corporate priorities of the council and applying these to Flood Risk Management. They are set out below.

Locally we will:

- Grow a thriving community
    - Reduce risk of flooding across the Borough and manage the residual risk, reducing the damage and disruption caused by flooding
    - Improve community understanding of local flood risk so they can take action to reduce the risk to themselves and their property
    - Manage development to ensure flood risk is not increased, and opportunities are taken to reduce flood risk through well planned and designed developments
- Living long, fulfilling and independent lives
    - Ensure flood risk works are designed to achieve multiple benefits and enhance the location by adding amenity and biodiversity value
- Providing value for money
    - Take opportunities to apply for external flood risk funding, and use any funds in the most efficient way to reduce flood risk.

4.4 How the Objectives will be achieved

To address these objectives we have developed a Local Strategy action plan. This sets out how we will seek to exercise our role and responsibilities under the FWMA and work to manage flood risk over the next 6 years and beyond.

The achievement of our Action Plan will be highly correlated to the availability of funding. Much of the work we have noted is dependant either partly or wholly on external funding sources (as outlined in Section 5). To manage this we have undertaken to review the Action Plan annually to ensure it is still realistic and achievable. As there are changes to funding availability we will review our programme and the prioritisation we place on each action to ensure it is still appropriate. It is expected that over the course of 6 years a number of the funding sources listed in Section 5 will cease, whilst new ones will be introduced. In reviewing our priorities each year the availability of funding will have significant impact on our programme of works.

Alongside our annual Action Plan review, we will also regularly assess the impact of local flooding events, to ensure that we prioritise the most high risk flood risk areas. High priority will be given to areas with reports of frequent internal property flooding.

5 Funding and Delivery

5.1 Funding Sources

There are many different possible funding sources and mechanisms. The potential for government funding to contribute to the cost of measures is greater at locations where the community is more vulnerable to the effects of flooding. Some of the key ones are listed below for consideration when developing flood risk management options:

- Flood and Coastal Erosion Risk Management Grant in Aid (GiA) – This funding is specifically for flood risk management measures, usually delivered by specific schemes. Schemes are more likely to receive GiA Funding where additional Partnership Funding (with other risk management authorities etc.) can be found to support their delivery. Some of our potential partners are shown below:
    - Thames Water – Flood alleviation projects to achieve Thames Water's commitment to remove all sewer flooding by 2027. Surface water flooding may in some instances be linked to Thames Waters flooding issues with the opportunity for both to gain benefits in joint delivery of a scheme.
    - Other LLFAs – work with other LLFAs in the delivery of flood risk management measures. These could be neighbouring authorities, (such as would be appropriate for flood alleviation works spanning two or more LLFA areas) or with non-neighbouring LLFAs (who are delivering similar projects such as awareness raising or publicity campaigns around flood risk management).
    - Partnership private funders – From local communities and business. Contributions from the beneficiaries of flood risk management measures. This can be sought in order to increase the likelihood of schemes attracting GiA funding.
- Local Levy – This funding is available from the Regional Flood and Coastal Committees and is allocated in a similar way to Flood and Coastal Erosion Risk Management Grant in Aid.
- Council Capital Funds – the London Borough of Bexley has a modest capital program to deliver flood risk management works.

- Council capital and revenue budgets – The Council sometimes undertakes larger (major) projects ranging from refurbishment of schools to the introduction of large scale public realm improvements. Where possible, officers will influence these projects to include or integrate identified flood risk management projects or influence the design to ensure projects or schemes reduce or mitigate flood risk.
- Community Infrastructure Levy (CIL) – CIL is a charge made against new development that can be used to fund local measures. For boroughs in London it is composed of two elements – local CIL (optional) and Mayoral CIL (compulsory). The Mayoral CIL goes to the Greater London Authority however the Local CIL can be used to invest in local infrastructure including flood relief and resilience works.
- DEFRA Grants - These are either allocated directly to support the introduction of new legislation and practices, or made available for local authorities to submit grant applications for funding for specific Government schemes
- The Catchment Restoration Fund – This is a fund administered by the Environment Agency aimed at the restoration of more natural features in and around water bodies.
- Greater London Authority – The top-tier administrative body for Greater London. Administers grants and funding for a range of cross London projects and schemes in line with the Mayor of London and London Assembly's objectives.
- Transport for London – Provide a range of funding streams to deliver projects which support the Mayor's Transport Strategy through a Local Implementation Plan (LIP).
- Big Lottery Fund (Communities Living Sustainably) – Available for partnerships that bring together the public, private, voluntary and community sectors to build sustainable and resilient communities to help deal with the potential impact of climate change.
- Heritage Lottery Fund – Provides grants to sustain and transform our heritage including parks, historic places, and natural environment.

We will work with other organisations to support their applications for funding where there will be a tangible flood risk benefit to Bexley and its residents. The main way we will do this will be via the South East London Flood Risk Management Partnership, and working directly with outside organisations.

5.2 Delivery

A cost / benefit appraisal considers the total expenditure required to deliver and maintain measures to manage flood risk and compares it to the resulting benefits (the benefits are based on estimated economic savings from preventing the damage and disruption that would have occurred if flooding had been allowed to continue). The total expenditure includes capital costs (such as those for studies, design and implementation) and maintenance costs (regular upkeep costs, any operational costs such as electricity and any consumable parts). The benefits are assessed for the operational life of the measure.

Wherever possible we will try to prepare schemes and measures that provide multiple benefits and unlock external funding opportunities. We have followed an Investment Strategy approach to identify schemes and measures that potentially

deliver multiple benefits and these are set out in our Action Plan. The approach identifies measures to reduce flood risk, focusing particularly on locations where vulnerable communities might be affected. In this way our Strategy seeks to make best use of the funding available and focus it on our communities with the greatest needs.

The level of detail available on costs and benefits for the measures identified in the Action Plan will depend on the data and information available. At this stage in the preparation of the Strategy there is not enough information to enable the preparation of a formal appraisal of benefits and costs for many of the measures identified. With the preparation and issue of subsequent Action Plans (at least annually) more information will become available and more detail on the benefits and costs will be included.

5.3 Prioritisation

The Council maintains a record of flooding incidents reported by residents, staff and road users. This information is used as the basis for prioritising the investigation of incidents and for assessing the extent and seriousness of the issues. Proposed flood risk management schemes are included in the Action Plan in accordance with a set of ranking criteria. These are, generally, in order of ranking: -

- Internal property flooding
- Highway flooding near shopping centres / important infrastructure
- Highways flooding generally
- Garden and open space flooding.

Before implementation of measures, a detailed site survey is undertaken and various designs and costed options considered. Outline solutions are then developed and budget costs prepared.

Our ability to fulfil our Action Plan is highly dependent on the availability of funding. Therefore our priorities also take into account the availability of external funding. It is anticipated that funding availability will change over time and consequently our prioritisation will shift to take advantage of availability of funds and make best use of alternative funding streams.

6 Environmental Assessment

6.1 Background

Our strategy required an Environmental Assessment to fulfil legislative requirements and assess how it might impact or contribute to the achievement of wider environmental objectives (SEA Directive) alongside the Conservation of Habitats and Species Regulations 2010 (HRA) and Water Framework Directive (WFD).

The process we have followed to achieve this is set out in Section 0.

6.2 Environmental Assessment Process



Figure 2 Environmental Assessment process flow chart

Our Screening report, Scoping report and responses to consultation SEA and HRA report and Statement of Environmental Particulars can all be found in Appendix D.

6.3 Summary of Conclusions

This Section provides an overview of some of the key overriding conclusions from the process and the statement of environmental particulars.

6.3.1 Screening

The screening reports concluded that an Environmental Assessment would be required for Bexley's Local Strategy. The Screening report can be found in Appendix D.1

6.3.2 Scoping and Consultation

A scoping report for Bexley's Local Strategy was submitted to the Environment Agency, Natural England and English Heritage for statutory consultation on the 28th July 2014. The final consultation response was received 11th September 2014. All three statutory consultees provided a consultation response. These responses can be found in Appendix D.3. The updated Scoping report can be found in Appendix D.2.

6.3.3 Statement of Environmental Particulars

A Statement of Environmental Particulars has been prepared prior to public consultation and can be found in Appendix D.5. This should be updated following the public consultation on the main Strategy document.

Appendices

A Glossary and Abbreviations
B Action Plan
C Summary of Consultations
D Environmental Assessment
  D.1 Screening report
  D.2 Scoping report
  D.3 Responses to Consultation
  D.4 SEA and HRA report
  D.5 Statement of Environmental Particulars
E Flood Risk Maps
F Equality Impact Assessment

A Glossary and Abbreviations

CDA	Critical Drainage Area
CIL	Community Infrastructure Levy
CIRIA	Construction Industry Research and Information Association
DCLG	Department for Communities and Local Government
DEFRA	Department for Environment, Food and Rural Affairs
Designating authority	The Council (under Schedule 1 of the Flood and Water Management Act)
FCERM	Flood and Coastal Erosion Risk Management
FCERM GiA	Flood and Coastal Erosion Risk Management Grant in Aid
Floods Directive	European Union Floods Directive 2007
Fluvial	Flooding attributed to river processes
FOI	Freedom of Information Act
FRM	Flood Risk Management
FRRs	Flood Risk Regulations 2009
FWMA	Flood and Water Management Act 2010
GiA	Grant in Aid
GLA	Greater London Authority
HRA	Conservation of Habitats and Species Regulations 2010
INTERREG	A collection of funds aimed at promoting inter-regional cooperation across the EU
KPI	Key Performance Indicator
LEPs	Local Enterprise Partnerships
LIFE+	A programme providing specific support for the implementation of European environment policy.
LLFA	Lead Local Flood Authority
Local Strategy/ LFRMS	Local Flood Risk Management Strategy
National Strategy	National flood and coastal erosion risk management strategy for England
Ordinary Watercourse	Every river, stream, ditch, dyke, sewer (aside from public sewers) and passage through which water flows which is not considered to be a main river, highway drain or private drain.
PFRA	Preliminary Flood Risk Assessment (under the Flood Risk Regulations, 2009)
Pluvial	Flooding attributed to rainfall
RFCC	Regional Flood and Coastal Committee
Riparian owner	Owning property next to or adjoining a river, stream or ditch grants you rights and responsibilities for that section
RMA	Risk Management Authority
SEA	The Strategic Environmental Assessment Directive
Solution Cell	Five-borough groundwater flooding prevention initiative (Croydon, Bexley, Bromley, Greenwich and Sutton)
SuDS	Sustainable Drainage Systems
SYMOLOGY	An Asset Management System
TfL	Transport for London
The Four Boroughs	South East London Lead Local Flood Authorities (Bexley, Bromley, Greenwich and Lewisham).
The Partnership	South East London Flood Risk Management Partnership (Boroughs of Bexley, Bromley, Greenwich and Lewisham, Thames Water and The Environment Agency)

TWUL	Thames Water Utilities Limited
WFD	Water Framework Directive

B Action Plan

This has been provided as a separate file alongside the strategy. If you have been unable to locate it, please contact flooding@bexley.gov.uk.

C Summary of Consultation Responses

C.1 Action Plan Consultation Response
C.2 Draft Local Strategy Consultation Response

These have been provided as separate files alongside the strategy. If you have been unable to locate these, please contact flooding@bexley.gov.uk.

D Environmental Assessment

D.1 Screening Report
D.2 Scoping Report
D.3 Responses to Consultation
D.4 SEA and HRA report
D.5 Statement of Environmental Particulars

These have been provided as separate files alongside the strategy. If you have been unable to locate these, please contact flooding@bexley.gov.uk.

E Flood Risk Maps

These have been provided as separate files alongside the strategy. If you have been unable to locate these, please contact flooding@bexley.gov.uk.

F Equalities Impact Assessment

This has been provided as a separate file alongside the strategy. If you have been unable to locate it, please contact flooding@bexley.gov.uk.