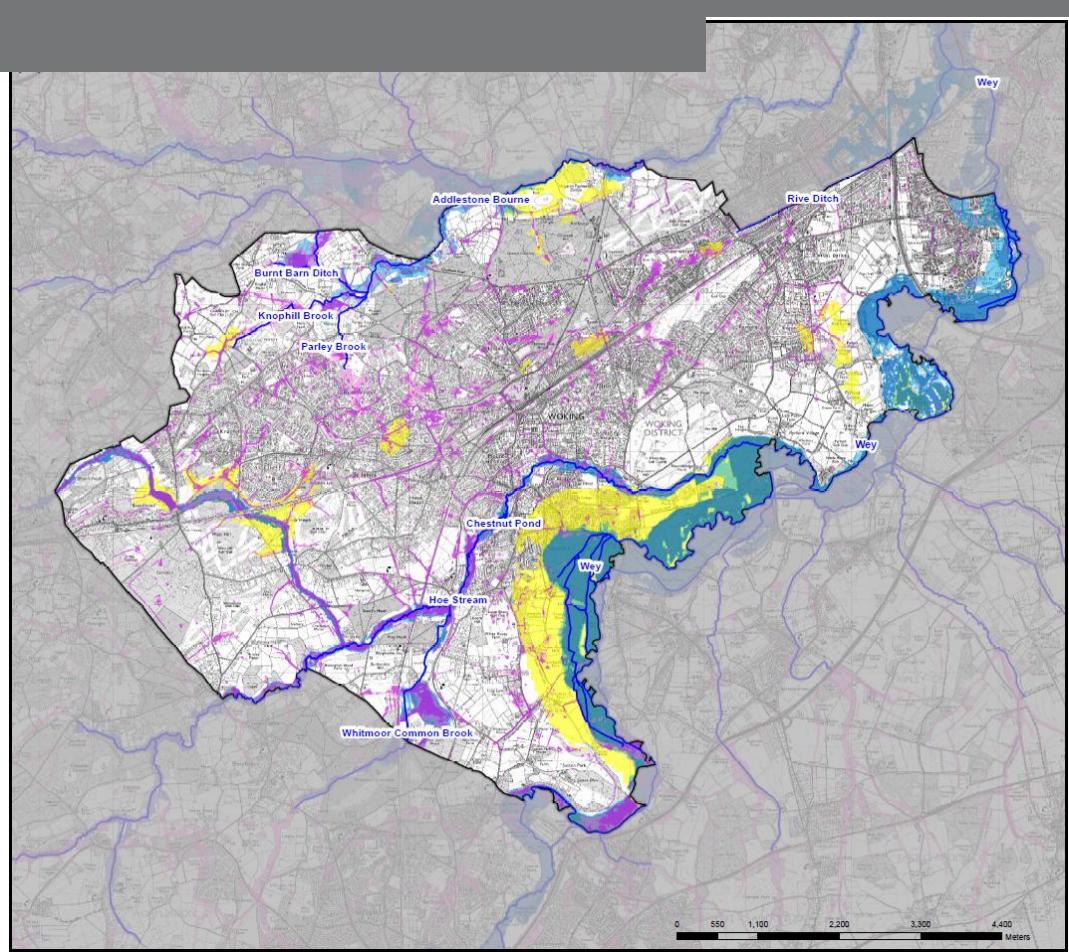


Woking Borough Council Strategic Flood Risk Assessment Volume 1 Decision Support Document

November 2015





Quality Management

| | | | |
|----------------------|---|-------------------------|-------|
| Job No | CS074594 | | |
| Project | Woking Borough Council SFRA Update | | |
| Location | P:\environment\ZWET\CS078748_Woking_SurreyHeath_SFRA\Reports and Outputs\Woking | | |
| Title | Volume 1 – Decision Support Document | | |
| Document Ref | Woking Borough Council SFRA Report Volume 1 Decision Support Document | Issue / Revision | Final |
| Date | November 2015 | | |
| Prepared by | Hayley Todd | Signature (for file) | |
| Checked by | Louise Markose | Signature (for file) | |
| Authorised by | Kerry Foster | Signature (for file) | |

Revision Status / History

| Rev | Date | Issue / Purpose/ Comment | Prepared | Checked | Authorised |
|-----|---------------|--|----------|---------|------------|
| 1 | March 2015 | Draft for Submission to WBC and Environment Agency | CJ | LM | MA |
| 2 | July 2015 | Final Draft for Submission to WBC and the Environment Agency | HT | LM | KF |
| 3 | October 2015 | Final Submission to WBC and the Environment Agency | HT/GA | LM | KF |
| 4 | November 2015 | Final | GA | LM | KF |



This document is the property of Woking Borough Council. If you have received it in error, please return it immediately to the above named Local Authority.

This report has been prepared by Capita Property and Infrastructure Limited with all reasonable skill, care and diligence within the terms of the Contract with the Client and taking account of the resources devoted to it by agreement with the client. We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above. This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.



Contents

| | |
|---|----|
| Executive Summary | 1 |
| 1. Introduction | 3 |
| 1.1 Background | 3 |
| 1.2 Aim of the SFRA | 3 |
| 1.3 SFRA Objectives | 3 |
| 1.4 WBC SFRA Structure | 4 |
| 2. Catchment Overview | 5 |
| 3. Flood Risk in Woking | 7 |
| 4. Policy Context | 9 |
| 4.1 Roles and Responsibilities | 9 |
| 4.2 European Policies | 12 |
| 4.3 National Policies | 13 |
| 4.4 Regional Policies | 15 |
| 4.5 Local Policies | 15 |
| 5. The Sequential Test | 17 |
| 5.1 What is the sequential test? | 17 |
| 5.2 How should the SFRA be used to apply the Sequential Test? | 20 |
| 6. The Exception Test | 22 |
| 6.1 What is the Exception Test? | 22 |
| 6.2 What is required to pass the Exception Test? | 22 |
| 7. Summary of High Risk Areas and Planning Considerations | 24 |
| 7.1 Summary of High Risk Areas | 24 |
| The Functional Floodplain | 25 |
| 7.2 Preliminary Drainage Areas | 26 |
| 7.3 Use of Emergency Plan in the Planning System | 26 |
| 7.4 Guidance for Developers | 27 |
| 8. Drainage of Development Sites | 28 |
| 8.1 What are SuDS? | 28 |
| 8.2 SuDS Policies | 28 |
| 9. Future Flood Risk Management Practices | 31 |
| 9.1 Flood Defences and Maintenance | 31 |
| 9.2 Flood Warnings | 31 |
| 9.3 Flood Alleviation Scheme Maintenance | 32 |
| 9.4 Flood Mitigation on site | 32 |
| 10. SFRA Maintenance and Management | 34 |
| 10.1 Data Collection | 34 |
| 10.2 Data Processing | 34 |
| 10.3 Data Ownership | 35 |
| 10.4 SFRA Data Management System | 35 |
| 11. Conclusions and Recommendations | 38 |
| 11.1 Summary of Flood Risk in Woking | 38 |
| 11.2 Policy Recommendations | 38 |
| 12. References | 41 |



13. Glossary

42

Figures

| | |
|--|----|
| Figure 2-1 – Woking Study Area | 5 |
| Figure 5-1 –Test Flow Chart | 21 |
| Figure 6-1 - An Application of the Exception Test for Local Plan preparation | 23 |
| Figure 7-1 – Map showing the areas of the Borough at high risk of flooding | 25 |

Tables

| | |
|--|----|
| Table 3-1 – Planning Policy Guidance Flood Zone Definitions | 7 |
| Table 5-1 –PPG Table 1 - Flood Zone Definitions | 17 |
| Table 5-2 – PPG Table 2 -Flood Risk vulnerability Classifications | 18 |
| Table 5-3 - PPG Table 3: Flood Risk Vulnerability and flood zone ‘compatibility’ | 19 |
| Table 5-4 – Definition of Flood Zones used within this SFRA | 20 |
| Table 10-1– Datasets that are known to be updated regularly | 37 |
| Table 11-1 – Summary of flood risk from all sources of flooding | 38 |
| Table 11-2 – General Recommendations | 39 |
| Table 11-3 – River Flooding Recommendations | 39 |
| Table 11-4 – Surface Water Flooding Recommendations | 39 |
| Table 11-5 – Groundwater Flooding Recommendations | 40 |
| Table 11-6 – Flooding from Artificial Sources Recommendations | 40 |
| Table 11-7 – Recommendations on keeping the SFRA ‘live’ | 40 |

Appendices

| |
|--------------------------------------|
| Appendix A – Data Register |
| Appendix B - Guidance for Developers |



Executive Summary

This report is a Level 1 Strategic Flood Risk Assessment (SFRA) for Woking Borough Council (WBC). This SFRA is an update to the previous SFRA for WBC (Bourne SFRA 2007, Wey SFRA 2008 and an overall update 2012) and has been prepared in accordance with current best practice, the National Planning Policy Framework (NPPF) and its accompanying Flood Risk and Coastal Change Planning Practice Guidance (PPG). This updated SFRA is formed of three volumes:-

- This is **Volume 1**, the Decision Support Document which outlines the relevant planning policies, recommendations and guidance for planners and developers. This document also sets out how to use the SFRA in carrying out the Sequential Test.
- **Volume 2** is the Technical Report, which is a technical analysis of the flood risk from all sources in WBC, and outlines the flood risk management measures associated with each source of flooding.
- **Volume 3** includes the flood risk maps, which represent as much of the data gathered as part of this update to visually display flood risk across the study area. The maps should be used in conjunction with this document, as well as Volume 2, and are referred to within the relevant chapters.

The SFRA has been based on best available data and users need to consider limitations of the quality and extent of the data used. This SFRA has utilised the information available from the Environment Agency's Addlestone Bourne Flood Risk Mapping Study (2007), Lower Wey (2009) and the Hoe Stream (2014). The Flood Risk Mapping data provides an improved level of accuracy and detail in relation to fluvial flood risk and has enabled a quantitative assessment of climate change impacts on flood risk from the Addlestone Bourne, Lower Wey and the Hoe Stream - Please note the Environment Agency will be issuing revised climate change allowances Autumn this year (2015). Other additional information on Flood Risk from the Environment Agency, Local Authorities and Thames Water has also been used to inform the SFRA.

Flood Risk across Woking Borough Council

| Type of Flood Risk | Summary | Further information |
|--------------------|--|----------------------|
| Fluvial | Modelled and historic flood extents indicate higher risk along floodplains of Wey, Hoe Stream and Whitmoor Common Brook. Defences modelled along Hoe Stream have significantly reduced flood risk. | Volume 2 Section 4.3 |
| Surface Water | Historically affected areas include Maybury, Byfleet, Old Woking and several roads (particularly Blackhorse Road), which are indicated as at higher risk. Modelling shows areas of Maybury and Sheerwater, Horsell and Goldsworth East at higher risk. | Volume 2 Section 5.3 |
| Sewers | Highest number of historical events in Old Woking and West Byfleet. Higher risk areas are the densely populated wards of Goldsworth West, Maybury and Sheerwater and Mount Hermon. | Volume 2 Section 7.3 |
| Groundwater | Highest groundwater flooding susceptibility in Old Woking and Pyford, where superficial river gravel deposits exist along the Wey floodplain. Parts of central Woking adjacent to Basingstoke Canal also at increased risk. No historic incidents. | Volume 2 Section 8.3 |



| Type of Flood Risk | Summary | Further information |
|--------------------|---|----------------------|
| Artificial Sources | Overall low, as breaching embankments unlikely. In situation, Basingstoke Canal is the highest flood risk source in the area, potentially flooding parts of central Woking. Sutton Place lake has minimal flood extent affected several farms in southern Woking Borough. | Volume 2 Section 9.3 |

Definition of Flood Zone 3b – the Functional Floodplain

PPG states that Local Planning Authorities (LPA's) should identify within their SFRA areas of functional floodplain (flood zone 3b) and its boundaries accordingly, in discussion with the Environment Agency (EA). The identification of functional floodplain should take into account of local circumstances. For the purpose of the Woking SFRA, Flood Zone 3b has been defined using the 5% AEP model outline from available hydraulic models. Where detailed model outlines and the definition of the 5% AEP outline was unavailable, Flood Zone 3 from the Environment Agency Flood Maps for Planning has been used to define the Functional Floodplain. A developed and undeveloped floodplain has also been defined as part of this SFRA.

Flood Zone 3b - developed includes only the existing built footprint and not areas of open space within the developed areas. The extent of the Functional Floodplain is discussed further in Volume 2, Chapter 4, and is represented in the map series in Volume 3, Figure 4.

Applying the Sequential Test

The Level 1 SFRA provides an evidence base for Woking Borough Council to carry out the Sequential Test. In applying the Sequential Test, development should be steered toward areas at least risk of flooding from all sources.



1. Introduction

1.1 Background

The previous iterations of this SFRA (River Bourne SFRA 2007, River Wey SFRA 2008 and an overall update 2012) were used to inform the WBC Core Strategy in October 2012. In this document, Policy CS9: *Flooding and Water Management* specifically reflects flood risk as outlined in the previous SFRA and with additional correspondence with the Environment Agency. The previous SFRA was formed from two parts, divided by natural hydrological boundaries of the Bourne Catchment and the Wey catchment. The study area for this updated SFRA is formed of the administrative Borough boundary only, as shown in Figure 2-1. WBC is now seeking to update its SFRA, as they are keen to ensure the information held on flood risk is continuously up to date.

Capita Property and Infrastructure were commissioned in January 2015 to update the WBC SFRA to include all watercourses within the study area.

The 2008 SFRA documents were developed in line with the now superseded Planning Policy Statement 25 – Development and Flood Risk (PPS25) (DCLG, 2006). On 27th March 2012, this was replaced by the National Planning Policy Framework (NPPF). NPPF states; “A Strategic Flood Risk Assessment is a study carried out by one or more planning authorities to assess the risk to an area from flooding from all sources, now and in the future, taking account of climate change, and to assess the impact that changes or development in the area will have on flood risk”.

The NPPF and its accompanying Planning Practice Guidance (PPG, March 2014) maintain the requirement to apply a risk-based, sequential process to the location of development in order to avoid flood risk to people and property. The key difference for flood risk policy compared to PPS25 is that the NPPF gives local authorities a wider remit to interpret and implement local policies. This makes the SFRA process all the more important in establishing suitable, reasonable and practical local development policies to manage local flood risk. Refer to Chapter 3 of this document for further discussion on the introduction of NPPF and its implications for the management of flood risk.

1.2 Aim of the SFRA

The aim of the WBC Level 1 SFRA is to ensure that all relevant information, including recent hydraulic modelling, is incorporated into this update, to maintain its ‘living document’ status. In addition the SFRA should form a reference document for use by development management officers for advising and determining decisions on windfall and allocated sites.

1.3 SFRA Objectives

In keeping with guidance presented in the NPPF and its accompanying Technical Guidance, the main objectives of the WBC Level 1 SFRA involve:

- Mapping flood risk from all sources within WBC, including definitions of the functional floodplain and sub-delineated areas of developed and undeveloped Flood Zone 3b.
- Assessing the impacts of climate change and residual risk
- Identification of flood risk management measures in place and coverage of the flood warning systems
- Identifying areas where additional development may significantly increase flood risk elsewhere through the impact of existing sources of flooding, or by additional surface water runoff
- Advice on the likely applicability of sustainable drainage systems techniques for managing surface water run-off across the Borough
- Production of a concluding map showing the areas of the Borough which are at high risk of flooding



- Provide sufficient evidence to allow WBC to formulate suitable policies to address flood risk management in a consistent manner across its administrative area
- Wider objectives of the SFRA include managing development accounting for flooding whilst ensuring no deterioration, and where possible, improvements to the ecological status of the river environment¹.

1.4 WBC SFRA Structure

This updated SFRA is formed of three volumes:-

- This is **Volume 1**, the Decision Support Document which outlines the relevant planning policies, recommendations and guidance for planners and developers. This document also sets out how to use the SFRA in carrying out the Sequential Test.
- **Volume 2** is the Technical Report, which is a technical analysis of the flood risk from all sources in WBC, and outlines the flood risk management measures associated with each sources of flooding.
- **Volume 3** includes the flood risk maps, which represent as much of the data gathered as part of this update to visually display flood risk across the study area. The maps should be used in conjunction with this document, as well as Volume 2, and are referred to within the relevant chapters.

¹ EU Water Framework Directive (or shorter the WFD).The Directive was published in the Official Journal (OJ L 327) on 22 December 2000.



2. Catchment Overview

The Woking Borough Council area is shown below, in Figure 2-1. A detailed description of the hydrology, topography, geology and demographics of the Borough are described further in Volume 2, Chapter 2, and are shown in Volume 3, Figure 1 and Figure 2.

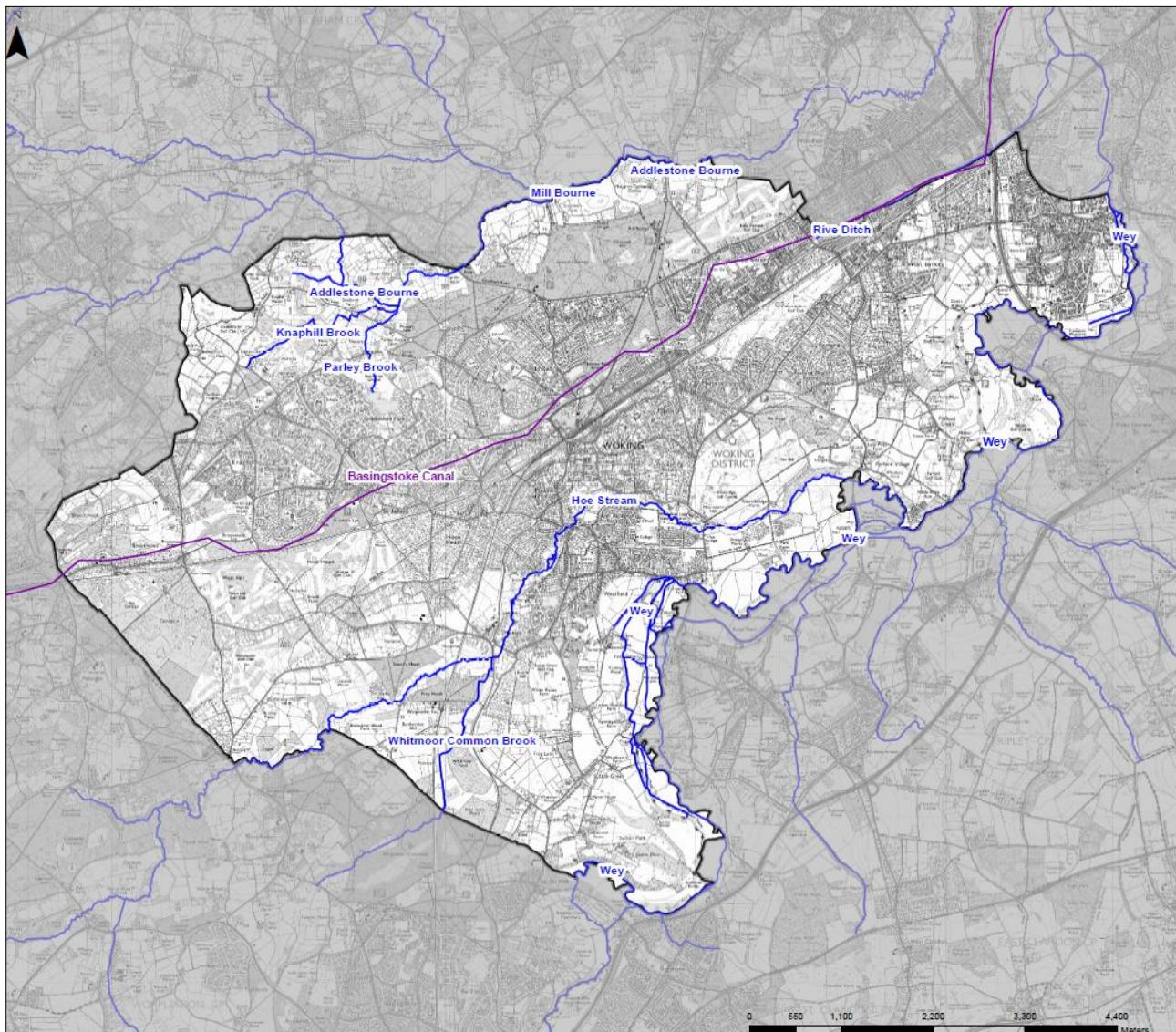


Figure 2-1 – Woking Study Area

The Woking SFRA covers an area of 63.41km² and within this the principle catchment is that of the River Wey running along the southern boundary of the borough. The Wey catchment includes the tributaries, Hoe Stream and to a lesser extent, Rive Ditch. Much of the Hoe Stream catchment is heavily urbanised, running through the south of the town of Woking, and subsequently several flood defence structures have been built along the Hoe Stream as part of the Hoe Valley Scheme.

The other major catchment included in the study area is that of the Addlestone Bourne which bounds Surrey Heath and Woking at the northern edge of the borough. The Addlestone Bourne tributaries, Burnt Barn Ditch, Knaphill Brook and Parley Brook, all rise and converge with the main river in the study area.



Running central to the study area is an artificial watercourse, the Basingstoke Canal. To the west of the Borough, this passes over the River Blackwater in an aqueduct. Downstream, at the north-eastern boundary of the Woking Borough, the canal runs parallel with the Rive Ditch and is capable of interacting with it. Other artificial structures in the catchment include the Wey Navigation, consisting of modified channels of the Wey and separate engineered channels, and the Sutton Place Lake in the south of the study area, which has the potential to breach.

The topography of the study area is determined by the River Wey floodplain, with hills gently grading into valley sides. The geology of the catchment predominantly comprises of Barton, Bracklesham and Bagshot formations, which are moderately impermeable clays, silts and sandstones. There are isolated river gravels along the Wey floodplain. There is a small area of principal aquifer to the North East corner of the borough, which is related to river terrace gravels.

The 2009 River Basin Management Plans have been used to identify the ecological status of the main river channels. The River Wey, Hoe Stream and the Bourne are all part of the River Thames River Basin district. All of the main rivers in the study area have a moderate ecological and chemical status, except for the Hoe Stream, which has a poor status. The Basingstoke Canal has moderate ecological and chemical status.

According to the EA's 2009 River Basin Management Plans, the current Ecological Quality of the River Wey is Moderate while that of the Hoe Stream is Poor. The current Chemical Quality of the River Wey is recorded as 'Fail'.



3. Flood Risk in Woking

NPPF identifies six forms of flooding, five of which are relevant to Woking, and (there is no risk from coastal flooding in Woking):

- Rivers
- Surface Water
- Sewers
- Groundwater
- Artificial Sources

Flooding from rivers and surface water present the greatest risk across the Borough. Although the Hoe Stream runs through central Woking and the River Wey through Byfleet are heavily urbanised, the majority of the land within the river catchments is rural or semi-rural. Much of the study area outside of the immediate floodplains is urbanised, with an average population density for Woking of 15.6 persons per hectare. There is an increased likelihood of surface water flooding and sewer flooding in urban areas, due to impermeable surfaces and culverted channels. Groundwater has the potential to be a localised issue and requires consideration in the planning process.

3.1.1 *Flood Risk from Main Rivers*

Flooding from rivers occurs when the volume of water in the river exceeds the capacity of the channel. In the south and east of the Borough, fluvial flood risk is from the Wey and its tributaries; in the north of the Borough; flood risk is from the Addlestone Bourne and its tributaries.

Different areas are at risk of flooding from different sized flood events. Four flood zones are defined by PPG based on the probability of flood events occurring. These are outlined in Table 3-1 below.

Table 3-1 – Planning Policy Guidance Flood Zone Definitions

| Flood Zone | Definition |
|---------------------------------------|--|
| Flood Zone 1 – Low Probability | Land having a less than 1 in 1000 annual probability of river flooding (<0.1% AEP) |
| Flood Zone 2 – Medium Probability | Land as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1% AEP) |
| Flood Zone 3a – High Probability | Land having a 1 in 100 or greater annual probability of flooding (>1% AEP) |
| Flood Zone 3b – Functional Floodplain | This Zone comprises of land where water has to flow or be stored in times of flood. |

For the purpose of this SFRA, specific SFRA flood zones have been derived, which can be used as a starting point for the Sequential Test decisions. These are defined in Table 5-4.

3.1.1.1 Definition of Flood Zone 3b – The Functional Floodplain

PPG states that Local Planning Authorities (LPA's) should identify within their SFRA areas of functional floodplain (flood zone 3b) and its boundaries accordingly, in discussion with the Environment Agency (EA). The identification of functional floodplain should take into account of local circumstances. For the purpose of the Woking SFRA, Flood Zone 3b will be defined using the 5% Annual Exceedance Probability (AEP) model outline from available hydraulic models. Where detailed model outlines and the definition of the 5%AEP outline is unavailable, Flood Zone 3 from the Environment Agency Flood Maps for Planning should be used to define the Functional Floodplain. The functional floodplain has also been divided into the developed and undeveloped Flood Zone 3b. Whilst there is no increased risk between the developed and undeveloped 3b definitions, this division recognises areas where development has previously occurred. Flood Zone 3b -



developed includes only the existing built footprint and not areas of open space within the developed areas. Flood risk betterment should be sought for redevelopment within these areas, and there should be no increase in development vulnerability classification or intensification in use. Volume 3, Figure series 5 shows the functional floodplain outline, as well as the remaining SFRA Flood Zones.

3.1.2 *Flood Risk from Surface Water*

Flooding from surface water can result from under capacity of drainage systems and blockage of pipes, or alternatively due to the presence of saturated ground after prolonged wet periods, reducing infiltration and increasing runoff. The urban drainage issue is most prevalent in major urban centres and has been known to lead to flooding within more densely urbanised areas of Woking including Maybury, Sheerwater and Goldsworth. Runoff due to saturated ground is more likely to happen in rural areas where water ponds on the surface. This can happen across the study area, but is more likely within the lower catchments, which in Woking Borough is the Wey. Historic and modelled data shows that Horsell, Hook Heath, Maybury, Sheerwater and Knaphill are at increased surface water risk.

3.1.3 *Flood Risk from Sewers*

The assessment of sewer flooding within this SFRA refers to flooding of water from combined or foul water sewers which results in foul water flooding. Flooding from surface water may impact on sewer flooding, however within this SFRA, surface water flooding refers to flooding from overland flow and runoff as a result of rain falling on the ground. No modelling of surface water drainage networks has been carried out or evaluated to further evaluate flood risk from the drainage network. No modelling of surface water drainage networks has been carried out or evaluated to further ascertain flood risk from the drainage network. Should Woking Borough Council feel it is necessary to do further investigation into sewer capacity and flood risk, the Council could carry out a Water Cycle Study or an assessment of their Sewage Treatment Works.

Where rainwater is drained into surface water or combined sewers, flooding can result when the volume received by the sewer exceeds its capacity. This can be due to under capacity, blockage, or the occurrence of an event greater than the design event of the sewer network. Within Woking Borough, Old Woking and West Byfleet have experienced sewer flood incidents. However, maintenance of drains following reported sewer incidents means that historic flood events may not always reflect future flood risk.

3.1.4 *Flood Risk from Groundwater*

Groundwater Flooding occurs when the groundwater table rises to levels which cause emergence at the surface. This is most likely to occur along the Wey floodplain, where superficial deposits of river alluvium can store small water tables and cause localised flooding. Otherwise, the underlying geology is relatively impermeable and presents low groundwater flood risk. The Environment Agency groundwater incident database has no reported records.

3.1.5 *Flood Risk from Artificial Sources*

Artificial sources of flooding include reservoirs, canals or lakes that are above the natural ground level. Flooding may occur as a result of any impoundment structure being overtapped or failing. This could cause significant threat to life due to deep, fast flowing floodwaters. No significant area is at risk from Sutton Place Lake, the only reservoir in the study area, as indicated by the EA reservoir inundation maps. The Basingstoke Canal presents flood risk through some central areas of Woking, where the adjacent land has a much lower elevation than the canal.



4. Policy Context

4.1 Roles and Responsibilities

4.1.1 Environment Agency

The Environment Agency is a government agency whose overarching objective is to protect and enhance the environment in England. Their role involves issues such as flood risk, water quality, water resources, biodiversity and mineral and waste regulators.

With regards to water management, the Environment Agency has a duty to:

- Maintain or improve any watercourses which are designed as Main Rivers².
- Maintain or improve the ecological status of water bodies in line with the requirements of the Water Framework Directive.

Provide advice to LPAs as a Statutory Consultee to the planning application process where a development is in Flood Zone 2 or Flood Zone 3. Statutory powers means that the Environment Agency has powers to (but are not required by law) maintain watercourses. These powers include:

- Install and operate flood warning equipment;
- Clearing blockages and carrying out maintenance on Main Rivers where obstructions could cause a flood risk; and
- Control actions by riparian owners and occupiers which might interfere with the free flow main rivers
- Provide advice on Plan making

The Development Management Procedure Order 2015 (DMPO) and Environment Agency's Flood Risk Standing Advice (FRSA) has been revised (April 2015). The **FRSA for planning authorities**³ and **FRSA for developers**⁴ provides substantive responses to flood risk issues. The FRSA provides substantive responses to councils on lower risk planning applications in regards to flood risk issues only. Bespoke comments on other non flood related issues may also be provided.

4.1.2 Surrey County Council, Lead Local Flood Authority

Surrey County Council (SCC) is the Lead Local Flood Authority (LLFA) for Woking and it has the 'lead' role in managing flood risk from surface water, groundwater and ordinary watercourses across the county. This involves close working with key partners involved in flood and water management for this geographic area, known as Risk Management Authorities. As the LLFA, SCC has powers to maintain Ordinary Watercourses. Ordinary Watercourses are all river channels not defined as Main Rivers, as set out in the EA "Living on the Edge" document⁵.

As the LLFA, the main duties and responsibilities of SCC include:

- Applying and monitoring the Local Flood Risk Management Strategy. This will be guided by the Environment Agency's National Flood and Coastal Risk Management Strategy.

² Main Rivers are generally larger streams or rivers, but can be smaller watercourses of local significance

³ <https://www.gov.uk/flood-risk-assessment-local-planning-authorities>

⁴ <https://www.gov.uk/flood-risk-assessment-for-planning-applications>

⁵ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/403435/LIT_7114.pdf



- Cooperating with other Risk Management Authorities within SCC, including the 11 other districts and boroughs, water utility companies, the Environment Agency and others.
- Maintain a register of local structures and features that are likely to have a significant effect on flood risk.
- In the event of a significant flood, investigate to an appropriate level whether the relevant flood risk management functions were exercised correctly.
- Contribute towards sustainable development when exercising a flood risk management function.
- Statutory consultee on planning applications from 15th April 2015 for major development with regard to surface water management

The Environment Agency will only provide high level advice on surface water flooding. The EA will also provide advice on surface water drainage in relation to water quality and pollution issues. Woking Borough Council has an informal agreement with Surrey County Council to review and provide comments on major planning applications in relation to surface water drainage designs. Woking Borough Council will also provide guidance on the maintenance and adoption of drainage schemes.

The council has convened an officer group to coordinate flood risk management activity. It is also involved in reporting on the implementation of the recommendations of the council's 2006/7 Flooding Task Group and 2008 Pitt Review Monitoring Task Group. The most recent report on progress against these recommendations was made to the Environment and Transport Select Committee in January 2012.

From December 2011, the council is required to establish and keep a register of structures and features, which are considered to have a significant impact on flood risk. This could include structures as small as a wall or underground rainwater storage tank. This register will take the form of a live database, and new structures/features will be added as information becomes available.

A current list of the structures and features on the register is available for public inspection and can be downloaded on the Flooding Asset Register webpage⁶.

4.1.3 *Woking Borough Council, (Local Planning Authority)*

Woking Borough Council is responsible for determining planning applications, requiring consultation with the Environment Agency in accordance with the Development Management Procedure Order (DMPO).

Following changes in National Planning Policy (outlined in Section 4.3.3), WBC as the LPA will be responsible for local planning policies and decisions on planning applications relating to major development. WBC will also have to ensure that sustainable drainage systems for the management of run-off are put in place, unless demonstrated to be inappropriate. SCC will act as a statutory consultee and WBC should consult SCC on the management of surface water and satisfy themselves that the proposed minimum standards of operation are appropriate. It should be ensured through the use of planning conditions or planning obligations that there are clear arrangements in place for ongoing maintenance over the lifetime of the development.

All development will potentially be able to put their SuDS up for adoption as long as they meet all of the following criteria:

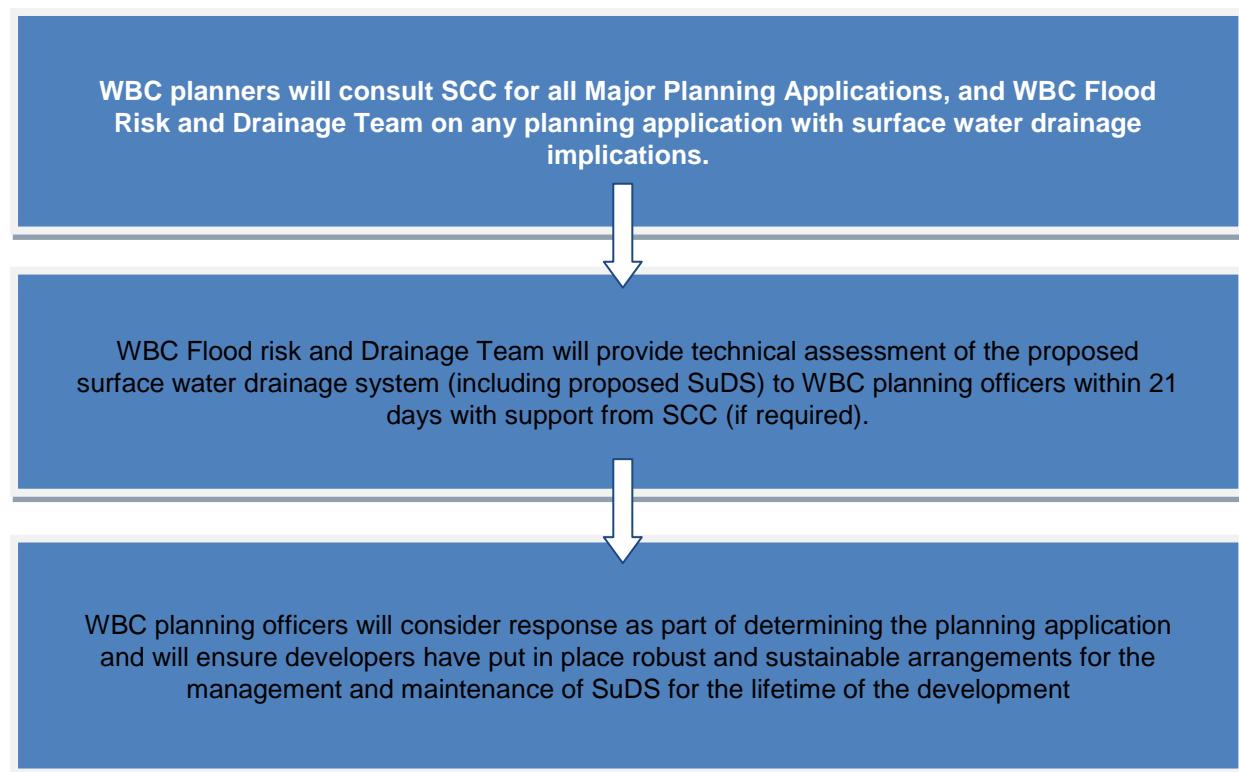
- Have been designed in accordance with the Woking Borough Council SuDS Design and Adoption Guide,
- Serve more than one property, and
- Are located with open public space

⁶ <http://www.surreycc.gov.uk/people-and-community/emergency-planning-and-community-safety/flooding-advice/more-about-flooding/flooding-asset-register>



In addition WBC has an informal agreement with SCC that the WBC Drainage and Flood Risk Engineering Team will be responsible for reviewing major planning applications with support from them when required. As this is still informal WBC are still required to consult them. A pro-forma and Validation list are now available setting out the required information to support a major planning application.

The flow chart below outlines how the relationship with the LLFA and the LPA will work in practice.



Volume 2 provides details of the Infiltration SuDS Map (detailed) developed by the British Geological Survey (BGS). The dataset provides subsurface information enabling preliminary assessment of the ground for infiltration SuDS. This dataset will assist developers, planners and WBC who need to assess the properties of the ground directly, or assess planning applications for SuDS.

4.1.4 Sewerage undertakers

Sewerage undertakers are responsible for surface water and foul drainage from developments, where this is adopted via adopted sewers. Thames Water is the sewerage undertakers within the study area.

The Flood and Water Management Act 2010 is set to remove the automatic right to connect to public surface water sewers. This may require developers to provide more justification than is currently required in order to connect to the Thames Water drainage network. It may in future be necessary to provide evidence that surface water runoff cannot be appropriately managed within the site through the use of soakaways or direct discharge to surface water in order to gain approval for connection to the public surface water sewer. Additionally, they have a role of providing information to LPAs so that an SFRA takes into account any areas of critical drainage problems.

Updates to the Planning Practice Guidance in April 2015 highlight that sewerage undertakers are not statutory consultees, however WBC will consult with Thames Water on all application that are proposing to discharge to their network.



4.1.5 Highways England

Highways England are responsible for maintaining major roads throughout England; this includes the upkeep of the surface water drainage infrastructure associated with the road network. Major roads within the study area include a short stretch of the M25 between junctions 10 and 11.

4.1.6 Landowners

Riparian Landowners are defined as, owners of land adjoining to, above or with a watercourse running through it, have certain rights and responsibilities in relation to the watercourse. The person who owns the land adjacent to a watercourse is the riparian owner. By law it is the riparian owner who is responsible for maintaining a watercourse. These are outlined in the Environment Agency's 'living on the edge' document⁷. The key responsibilities associated with flood risk are highlighted below:

- Let water flow through owned land without any obstruction, pollution or diversion which affects the rights of others.
- Accept flood flows through owned land, even if these are caused by inadequate capacity downstream. A landowner has no duty in common law to improve the drainage capacity of a watercourse he/she owns.
- Keep the banks clear of anything that could cause an obstruction and increase flood risk, either on owned land or downstream if it is washed away.
- Responsible for maintaining the bed and banks of the watercourse and the trees and shrubs growing on the banks. The property owner should always leave a development-free edge on the banks next to a watercourse
- Keep any structures, such as culverts, trash screens, weirs and mill gates, clear of debris.
- Responsible for protecting your property from water that seeps through natural or artificial banks. Where this damages a flood defence, the local risk management authority may require you to pay for repairs.

4.2 European Policies

4.2.1 Water Framework Directive (EU Directive 2000/60/EC)

The EU Water Framework Directive was developed following a review of EU water policy. The WFD requires that rivers, coastal waters and groundwater achieve "good ecological and chemical status" or potential by 2027 and are prevented from deteriorating. This is carried through an integrated River Basin Management Plan and includes the management of both biological and chemical elements. This is a method of ensuring all requirements and pressures on the water environment are taken into account within a river basin. The implications of the Water Framework Directive on flood risk can include controls on the type of flood alleviation schemes that can be implemented and that any flood alleviation schemes should also contribute to achieving 'good ecological status' and preventing deterioration through methods such as restoration of floodplains to their natural state and purpose. The Thames River Basin Management Plan covers the Borough of Woking.

4.2.2 Floods Directive

The European Directive on the Assessment and Management of Flood Risks (European Union, 2007) came into force on the 26th November 2007. The directive was transposed into English and Welsh law as the Flood Risk Regulations in December 2009. The directive requires member states to consider the potential impacts that domestic policies might have on flood risks and the management of flood risks to neighbouring member

⁷ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/403435/LIT_7114.pdf



states. It recognises that objectives regarding the management of flood risk should be determined by the Member States themselves and should be based on local and regional circumstances.

The Directive requires Member States to designate competent authorities to implement the Directive; for England, this is the Environment Agency. The Directive requires the following elements to be undertaken:

- Preliminary Flood Risk Assessments to identify areas that are at potentially significant flood risk, to be completed by 20 December 2011;
- Flood hazard maps (showing the likelihood and flow of the potential flooding) and flood risk maps (showing the impact), to be completed by 20 December 2013;
- Flood risk management plans (showing measures to decrease the likelihood or impact of flooding), to be completed by 22 December 2015; and
- Updates every 6 years thereafter that take into account the impact of climate change.

The Surrey Preliminary Flood Risk Assessment (2011) confirmed that part of the County Council's administrative area is in a 'Flood Risk Area' (the Greater London Flood Risk Area) and is therefore required to deliver flood hazard / risk maps and a flood risk management plan under the Regulations.

4.3 National Policies

Since the 2008 SFRA's were completed, updates to national planning policy and flood risk have been implemented. This section highlights the main changes and the impacts they have on the SFRA.

4.3.1 Flood and Water Management Act (2010)

The Flood and Water Management Act 2010 places significantly greater responsibility on Lead Local Flood Authorities to manage and lead on local flooding issues. As the LLFA, the Act sets out the requirements and targets of Surrey County Council:

- Taking an active role leading flood risk management
- Cooperating with other relevant authorities to manage local flood risk
- Investigating flood incidents and reporting upon them
- Maintaining an 'Asset Register' of assets that have a significant influence on local flood risk
- Designating 'features' that have a significant influence on local flood risk
- Regulating works on 'ordinary watercourses'
- Development and implementation of the Local Flood Risk Management Strategies (LFRMS)
- Providing support to the LPA, acting as the statutory consultee on the delivery of SuDS techniques where necessary

The Flood and Water Management Act also clarifies three key areas that influence development:

- Sustainable drainage (SuDS) - the Act makes provision for a national standard to be prepared on SuDS. Developers will be required to obtain LPA approval for the SuDS in accordance with the Non-Statutory Technical Standards for sustainable drainage systems as part of the planning application process.
- Flood risk management structures - the Act enables the Risk Management Authorities to designate structures such as flood defences or embankments owned by third parties for protection if they affect flooding or coastal erosion. A developer or landowner will not be able to alter, remove or replace a designated structure or feature without first obtaining consent.
- Permitted flooding of third party land – Only in exceptional circumstances and only where works pass the required tests of the FWMA, the EA and local authorities have the power to carry out work which may cause flooding to third party land. This is very unlikely, and will only occur where/when the works are deemed to be in the interest of nature conservation, the preservation of cultural heritage or people's enjoyment of the environment or of cultural heritage.



4.3.2 National Planning Policy Framework (2012)

The National Planning Policy Framework⁸ was issued in March 2012 and outlines the national policy including on development and flood risk assessment. This replaced with immediate effect national policy including Planning Policy Statement 25 – Development and Flood Risk.

The NPPF requires Local Plans to be supported by a Strategic Flood Risk Assessment and develop policies to manage flood risk from all sources. Advice should be sought from the Environment Agency and other relevant flood risk management bodies, such as Lead Local Flood Authorities. Planners should use the Sequential Test as the primary decision making tool, and if this is passed and it is deemed necessary to place development in higher flood risk zones, apply the Sequential Approach to steer vulnerable development within the red line boundary to areas at lowest risk of flooding.

4.3.3 National Planning Policy Guidance

The Technical Guidance to the National Planning Policy Framework⁹ has been superseded by the Planning Practice Guidance Flood Risk and Coastal Change¹⁰ (April 2015) which sets strict tests to protect people and property from flooding. All local planning authorities are expected to follow the PPG. Where these tests are not met, national policy is clear that new development should not be allowed. The main step to be followed is designed to ensure that development is directed to the lowest risk of flooding (the Sequential Test). Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding. This is in accordance with paragraph 101 of the NPPF.

The National Planning Practice Guidance document provides guidance on how the local planning authorities should:

- Assess flood risk;
- Avoid flood risk; and
- Manage and Mitigate flood risk and coastal change.

There is also information on the requirements to consult the Environment Agency, on the role of lead local flood authorities and on flood risk in relation to minor developments. In addition, NPPF provides information on the application of the Sequential and the Exception Tests in the preparation of a Local Plan.

The April 2015 update to the practice guidance provides additional guidance on SuDS, including:

- The importance of SuDS;
- When SuDS should be considered;
- The SuDS discharge hierarchy;
- Factors a local authority will address when considering SuDS as part of a planning application;
- When SuDS are inappropriate and relevant flood risk consultees;
- Applicability of Defra's Non-statutory Technical Standards for Sustainable Drainage Systems;
- Design and construction cost considerations;
- Operation and maintenance considerations; and
- Where to go for further SuDS advice.

As part of the April 2015 update, the practice guidance provides details on the parties responsible for assessing the suitability of SuDS practices. As per paragraph 084 from the practice guidance:

⁸ National Planning Policy Framework (DCLG, 2012)

⁹ Technical Guidance to the National Planning Policy Framework (DCLG, 2012)

¹⁰ <http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/>



The decision on whether a sustainable drainage system would be inappropriate in relation to a particular development proposal is a matter of judgement for the local planning authority. In making this judgement the local planning authority will seek advice from the relevant flood risk management bodies, principally the lead local flood authority, including on what sort of sustainable drainage system they would consider to be reasonably practicable.

4.3.4 Non-statutory Technical Standards for Sustainable Drainage Systems, March 2015

This document, published by the Department for Environment, Food and Rural Affairs, sets out non-statutory technical standards for sustainable drainage systems. The non-statutory technical standards should be used in conjunction with the National Planning Policy Framework and Planning Practice Guidance.

Non-statutory technical standards are provided for the following items:

- Flood risk outside the development;
- Peak flow control;
- Volume control;
- Flood risk within the development;
- Structural integrity;
- Designing for maintenance considerations; and
- Construction.

Woking Borough Council will offer adoption for all new SuDS Features that meet the Woking Borough Council SuDS Adoption Criteria, set out within the Woking Borough Council SuDS Design and Adoption Guide¹¹. All Major planning applications will need to set out who will be responsible for maintaining and inspecting the drainage system for the lifetime of the development and include a detailed SuDS maintenance plan.

4.4 Regional Policies

4.4.1 Catchment Flood Management Plans

A Catchment Flood Management Plan (CFMP) is a high-level strategic planning document that provides an overview of the main sources of flood risk and how these can be managed in a sustainable framework for the next 50 to 100 years. The Environment Agency engages stakeholders within the catchment to produce policies in terms of sustainable flood management solutions whilst also considering local land use changes and affect of climate change.

The approach that the Environment Agency would like to see taken to flood risk management within the Study Area is outlined in the Thames CFMP. The Woking SFRA Study area is covered by sub-area groups Rural Wey, Addlestone Bourne and Hoe Stream. The proposed management policies are discussed further in Volume 2, Chapter 4.

4.5 Local Policies

4.5.1 Local Flood Risk Management Strategy

Surrey County Council is the Lead Local Flood Authority for Woking Council. SCC is required to develop, maintain, apply and monitor a Local Flood Risk Management Strategy (LFRMS). The strategy aims to increase awareness of local flood risk issues, and set out how partners are working together to reduce flood risk. The document provides an overview of the ongoing flood risk management work underway across Surrey for 2012-2016. The Surrey Flood Risk Partnership Board oversees the strategy. Reflecting the requirements of

¹¹ http://connect.woking.public-i.tv/document/item_5_Adoption_of_Sustainable_Drainage_Systems_SUDS_19_March_2015.pdf



the Flood and Water Management Act (2010) and the National Flood and Coastal Erosion Risk Management Strategy (2011) the LFRMS aims to make it easier for management authorities to work together and clarify roles, providing a clear overview of the levels of flood risk throughout the County by considering flooding issues at catchment level. The strategy also aims to reflect the concerns of residents and business, in order to appropriately prioritise the spending on schemes aimed to reduce flood risk. The strategy must cover how and when the flood risk reduction measures will be implemented, how much they cost and how they will be paid for.

The document can be found online at:

http://www.surreycc.gov.uk/_data/assets/pdf_file/0006/393486/Surrey-LFRMS-Final-consultation-draft.pdf

4.5.2 Woking Core Strategy

Woking Borough Council has a statutory responsibility to prepare Local Development Documents (LDD) that will collectively replace the Woking Borough Local Plan (1999). The Core Strategy provides the local strategic planning policy for all the other LDDs which will be prepared. It sets out a plan for the period up to 2027, with policies and proposals intending to enhance the strengths and opportunities of the Borough, as well as addressing and assessing the weakness and threats. One such threat is the flood risk in the area, which is addressed by the Borough-wide policy CS9, 'Flooding and Water Management' that specifically focuses on the location of new developments relative to flood risk.

4.5.3 Surrey Preliminary Flood Risk Assessment

A Preliminary Flood Risk Assessment (PFRA) was prepared for Surrey County Council in June 2011. The report was prepared to ensure Surrey County Council met their duty to deliver the requirements of the Flood Risk Regulations (2009).

The PFRA is aimed at providing high level overview of flood risk from all sources of flooding within the local area, including consideration of surface water, groundwater, ordinary watercourses and canals.

The EA has used a national methodology, which was set out by Defra, to identify Indicative Flood Risk Areas (IFRA) across England. Of the ten IFRAs that have been identified nationally, only one affects part of the County Council's administrative area – The London IFRA. Within this Flood Risk Area, the Regulations require Surrey County Council to carry out two subsequent key stages:

- Produce flood hazard maps and flood risk maps; and
- Produce flood risk management plans.

The London IFRA extends into the north of Surrey and covers parts of Tandridge, Reigate and Banstead, Elmbridge, Epsom and Ewell and Mole Valley.



5. The Sequential Test

5.1 What is the sequential test?

The NPPF Sequential Test is a risk based approach to determine the suitability of development according to flood risk from all sources. The NPPF requires LPAs to apply the Sequential Test at all stages of the planning process to ensure that where possible developments are removed from areas with a high probability of flooding. Through the application of the Sequential Test LPAs are encouraged to guide new development towards areas of the lowest flood probability.

Allied to the Sequential Test, NPPF also assigns different vulnerabilities to different types of development (Table 2 of the Planning Practice Guidance (PPG) for Flood Risk and Coastal Change). When applying the Sequential Test, the LPA should also bear in mind the vulnerability classification of the proposed development, to assess if it is appropriate in an area of flood risk. In some circumstances, it will be necessary for the Exception Test to be undertaken to justify some types of development in the floodplain (discussed further in Chapter 6).

NPPF also assigns which types of development are compatible within each flood zone (Table 3 of the PPG for Flood Risk and Coastal Change). Using the information within these tables (Table 5-1, Table 5-2 and Table 5-3) in tandem with the Sequential Test methodology set out below, planners should guide developments to those areas where the development vulnerability is appropriate to the flooding probability.

Table 5-1 – PPG Table 1 - Flood Zone Definitions

| Flood Zone | | Definition |
|------------|---------------------------|--|
| Zone 1 | Low Probability | Land having a less than 1 in 1,000 annual probability of river or sea flooding. (<0.1% AEP) |
| Zone 2 | Medium Probability | Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% - 0.1% AEP) |
| Zone 3a | High Probability | Land having a 1 in 100 or greater annual probability of river flooding. (>1% AEP) |
| Zone 3b | The Functional Floodplain | This zone comprises land where water has to flow or be stored in times of flood. |



Table 5-2 – PPG Table 2 -Flood Risk vulnerability Classifications

| Vulnerability Classification | Types of Development |
|-------------------------------------|--|
| Essential Infrastructure | <ul style="list-style-type: none"> Essential transport infrastructure (including mass evacuation routes), which has to cross the area at risk, and strategic utility infrastructure |
| Highly Vulnerable | <ul style="list-style-type: none"> Police, Ambulance and Fire stations and Command Centres and telecommunications installations required to be operational during flooding and emergency dispersal points Basement dwellings, Caravans, mobile homes and park homes intended for permanent residential use. Installations requiring hazardous substances consent. |
| More Vulnerable | <ul style="list-style-type: none"> Hospitals, residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. Buildings used for: dwelling houses; student halls of residence; drinking establishments; nightclubs; and hotels. Non-residential uses for health services, nurseries and educational establishments. Landfill and sites used for waste management facilities for hazardous waste. Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan. |
| Less Vulnerable | <ul style="list-style-type: none"> Buildings used for: shops; financial, professional and other services; restaurants and cafes; hot food takeaways; offices; general industry; storage and distribution; non-residential institutions not included in 'more vulnerable'; and assembly and leisure. Land and buildings used for agriculture and forestry. Waste treatment (except landfill and hazardous waste facilities). Minerals working and processing (except for sand and gravel working). Water treatment plants and sewage treatment plants (if adequate pollution control measures are in place). |
| Water-Compatible Development | <ul style="list-style-type: none"> Flood control infrastructure and Water transmission infrastructure and pumping stations and sewage transmission infrastructure and pumping stations. Sand and gravel workings. Docks, marinas and wharves and navigation facilities. MOD defence installations and ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. Water-based recreation (excluding sleeping accommodation). Lifeguard and coastguard stations. Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan. |

**Table 5-3 - PPG Table 3: Flood Risk Vulnerability and flood zone 'compatibility'**

| Flood Zones | Essential Infrastructure | Highly Vulnerable | More Vulnerable | Less Vulnerable | Water-Compatible Development |
|-------------|--------------------------|-------------------------|-------------------------|-----------------|------------------------------|
| Zone 1 | ✓ | ✓ | ✓ | ✓ | ✓ |
| Zone 2 | ✓ | Exception Test Required | ✓ | ✓ | ✓ |
| Zone 3a | Exception Test Required | ✗ | Exception Test Required | ✗ | ✓ |
| Zone 3b | Exception Test Required | ✗ | ✗ | ✗ | ✗ |

Table 5-4 has been adapted to form the SFRA Flood Zone definitions that WBC should use as starting points within the SFRA. Beyond these fluvial SFRA flood zones, application of the Sequential Test must consider the impacts of all sources of flooding. The fluvial SFRA flood zone definitions include available detailed modelling results, and are therefore more accurate than using the EA flood zones alone. The definitions of each zone along the different watercourses are outlined in Table 5-4.

For the purpose of Woking SFRA, the functional floodplain has been divided into the developed and undeveloped flood zone 3b using MasterMap data to define the developed areas as the building footprint. A simple clipping process has been used at the extents of the flood zone 3b to define the developed areas. Flood Zone 3b - developed includes only the existing built footprint and not areas of open space within the developed areas.

**Table 5-4 – Definition of Flood Zones used within this SFRA**

| SFRA Flood Zone | Lower Wey | Hoe Stream/Whitmoor Common Brook | Hoe Stream tributary | Addlestone Bourne | Rive Ditch |
|-----------------------------------|-------------------|----------------------------------|--|-------------------|--|
| SFRA Flood Zone 2 | 0.1% AEP event | 0.1% AEP event | EA Flood Zone 2 | EA Flood Zone 2 | EA Flood Zone 2 |
| SFRA Flood 3- Plus climate change | 1% AEP + CC event | 1% AEP + CC event | Not defined – displays EA Flood Zone 3 | 1% AEP + CC event | Not defined – displays EA Flood Zone 3 |
| SFRA Flood Zone 3a | 1% AEP event | 1% AEP event | EA Flood Zone 3 | 1% AEP event | EA Flood Zone 3 |
| SFRA Flood Zone 3b | 5% AEP event | 5% AEP event | EA Flood Zone 3 | 5% AEP event | EA Flood Zone 3 |
| SFRA Flood Zone 3b - undeveloped | 5% AEP event | 5% AEP event | Not defined – displays EA Flood Zone 3 | 5% AEP event | Not defined – displays EA Flood Zone 3 |
| SFRA Flood Zone 3b - developed | 5% AEP event | 5% AEP event | Not defined – displays EA Flood Zone 3 | 5% AEP event | Not defined – displays EA Flood Zone 3 |

5.2 How should the SFRA be used to apply the Sequential Test?

In accordance with Policy CS9, all development within Flood Zone 2, 3a and 3b will need to demonstrate that the sequential test has been passed and if it has been successfully passed, it may also be necessary to apply the exception test. If the exception test is not required, the developer will still need to demonstrate that the site is safe from flooding and does not increase flood risk to the site itself or elsewhere. This should be done through a specific Flood Risk Assessment.

Woking Borough Council should use the information presented in this Level 1 SFRA to undertake the Sequential Test for any potential development sites or windfall sites. The Sequential Test should be accurately documented to ensure that the decision processes followed for the locating of a development are consistent and transparent.

It is recognised that flood risk information must be considered alongside other spatial planning issues. Allocations are thus “Tested” on the basis of their flood risk attributes and the outcome used to inform decisions that include other spatial planning issues such as transport, housing, economic growth, natural resources, regeneration, biodiversity, the historic environment and management of other hazards.

To perform the Test WBC first need to be aware of what sites are reasonably available alternatives in their council area. It is necessary to clearly define “reasonably available” and be able to provide evidence that there are not locations outside of those considered with a lower probability of flooding that could be considered to be “reasonably available” for the type of development proposed.

When applying the Test it will be important for WBC to demonstrate:

- That a transparent process has been formulated and followed;
- That this process has sought to steer new development to areas with the lowest probability of flooding (according to Table 1 PPG); and
- That full consideration has been given to reasonably available alternatives on land with a lower probability of flooding

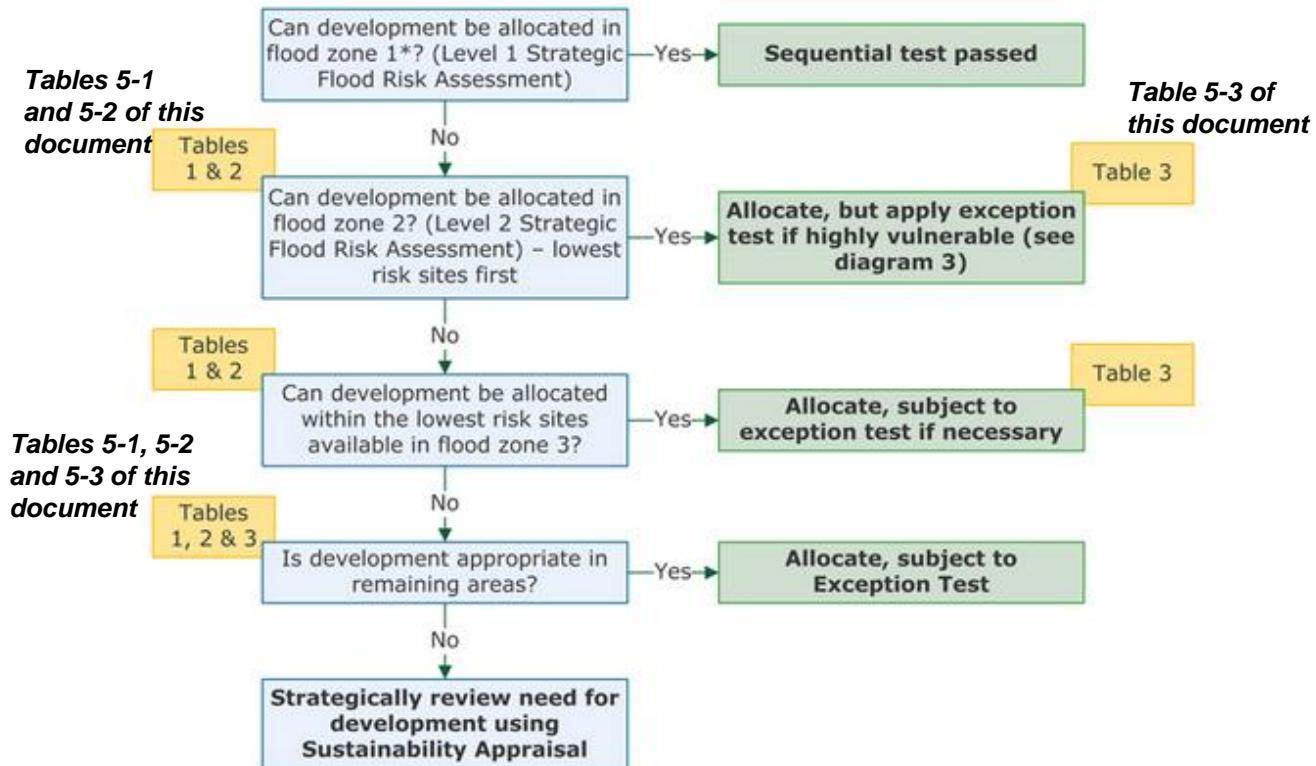


The protocols adopted for the Sequential Test should ideally be agreed with the Environment Agency. It is important that the decision maker engages key stakeholders early in the decision making process. It is also important to consider uncertainty of information when making land use planning decisions. WBC, in consultation with the EA, may wish to consider the adoption of a 'layered' approach to the application of the Sequential Test in Woking.

At the first stage, the Sequential Test will be applied to the general development areas within the borough and then subsequently, in the second stage, applied to individual allocation sites within these development areas. If favoured this "layered approach" will require further consultation with the Environment Agency and should be subject to agreement with the Environment Agency prior to application

The flood risk information required to address the four stages (shown in Figure 5-1) in the application of the Sequential Test noted above is provided in the relevant sections of Volume 2, and the flood maps in Volume 3 of this SFRA.

Figure 5-1 –Test Flow Chart¹²



¹² Planning Practice Guidance, March 2014



6. The Exception Test

6.1 What is the Exception Test?

The Exception Test allows necessary development to go ahead when sites with a lower risk of flooding are not available. It may not always be appropriate to apply the Exception Test.

As shown in Volume 3, some areas of WBC area are within Flood Zones 2 and 3 and are predicted to have a medium or high risk of flooding.

6.2 What is required to pass the Exception Test?

Figure 5.1 in Section 5 highlights the stages in the Sequential Test at which the Exception Test may need to be applied. The Planning Practice Guidance provides additional guidance on the application of the Exception Test.

If, following application of the Sequential Test, it is not possible, for the development to be located in zones with a lower probability of flooding, the Exception Test can be applied if appropriate. For the Exception Test to be passed:

- it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh or are neutral to, flood risk, informed by a Strategic Flood Risk Assessment where one has been prepared; and
- a site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

The first of the criteria should be addressed through a sustainability appraisal¹³. Where the score is neutral, because sites have been located accordingly in Flood Zone 1, the sites should be considered sustainable.

If a potential allocation fails to score positively; it has failed the exception test. This should be overcome at pre-application stage.

The second part of the Exception Test relates to the “safety” of the development. The Planning Practice Guide provides detail on ‘What is safe?’ When considering safety, specific local circumstances need to be taken into account, including:

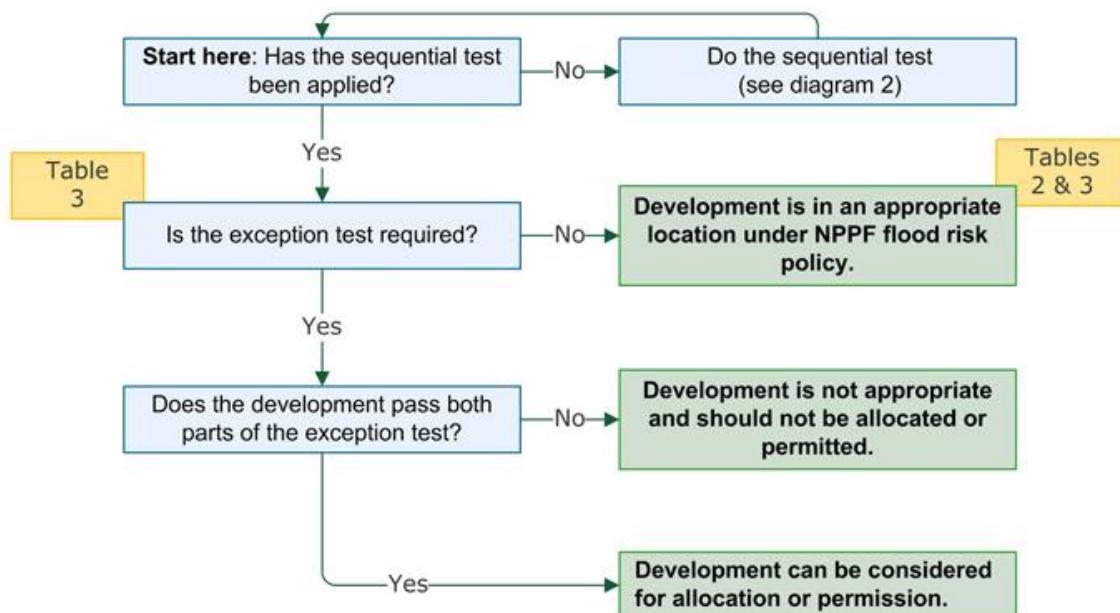
- The characteristics of a possible flood event, e.g. the type and source of flooding and frequency, depth, velocity and speed of onset;
- The safety of people within a building if it floods and also the safety of people around a building and in adjacent areas, including people who are less mobile or who have a physical impairment. This includes the ability of residents and users to safely access and exit a building during a design flood and to evacuate before an extreme flood;
- The structural safety of buildings, and;
- The impact of a flood on the essential services provided to a development.

Figure 6-1 presents the process that should be followed by WBC in its application of the Exception Test under the PPG

¹³ <http://planningguidance.planningportal.gov.uk/blog/guidance/strategic-environmental-assessment-and-sustainability-appraisal/sustainability-appraisal-requirements-for-local-plans/>



Figure 6-1 - An Application of the Exception Test for Local Plan preparation¹⁴



It is important that Woking Borough Council retain a record of all their assumptions and decisions with regard to both the Sequential and Exception Tests, in order to demonstrate that they have performed the process. Once the Tests are completed, and WBC are satisfied with the outcome, it is then possible to continue with the development process.

¹⁴ Planning Practice Guidance, March 2014



7. Summary of High Risk Areas and Planning Considerations

7.1 Summary of High Risk Areas

A map showing the areas of the Borough which are at a high risk of flooding, taking into account all sources of flooding, residual risk and climate change is shown in Volume 3, Figure 14, and reproduced below in Figure 7-1. The flood risk classifications have been defined according to the following definitions:

Fluvial flood risk:

- Very high – Flood Zone 3b (5% AEP plus EA flood zone 3 where detailed modelling unavailable)
- High risk – EA Flood Zone 3a

Surface water flood risk:

- High risk – 3.3% AEP outline from the Updated Flood Map for Surface Water
- Medium risk – 1% AEP outline from the Updated Flood Map for Surface Water

Groundwater flood risk:

- Areas where the BGS groundwater susceptibility dataset shows that there is potential for groundwater flooding to occur at the surface

Volume 3, Figure 14 shows that the river corridors are subject to high risk from fluvial and surface water sources, as well as some groundwater flood risk. Much of the areas at high risk from two or three of these sources are undeveloped rural floodplain, including the areas around Brookwood and Brook Heath.

Along the Wey corridor there are large areas at high risk of fluvial flooding throughout the south and eastern parts of Byfleet, including Sanway in the south and Parvis Road. Most of the areas at high risk from the Addlestone Bourne are rural and undeveloped. The floodplains of the Hoe Stream are at high risk of flooding. This includes developed areas including the A320 and Mayford, and the A327 at Elm Bridge. Much of the high risk areas are parkland green space. It is important these floodplains remain undeveloped.

Many of the roads throughout the Borough are at high risk of surface water flooding. This includes, the A320 between Hook Heath and Kingsfield, White Rose Lane in central Woking, Lower Guildford Road in Knaphill, many of the residential streets across Goldsworth Park and Monument Road at Maybury. The mainline railway is at high risk of surface water flooding at Sheerwater and St Johns. At Brookwood and in northern Knaphill, there are larger areas at risk of surface water flooding from overland flow, however these are mostly undeveloped.

The main areas at high risk of groundwater flooding are along the river valleys where the groundwater table is likely to be higher and fluvial deposits allow movement through the ground. This is the case to the south of Knaphill and in the very north of the Borough along the Addlestone Bourne. Along the River Wey, there are large areas at elevated groundwater flood risk, including the developed parts of Old Woking, Kingfield and Westfield.

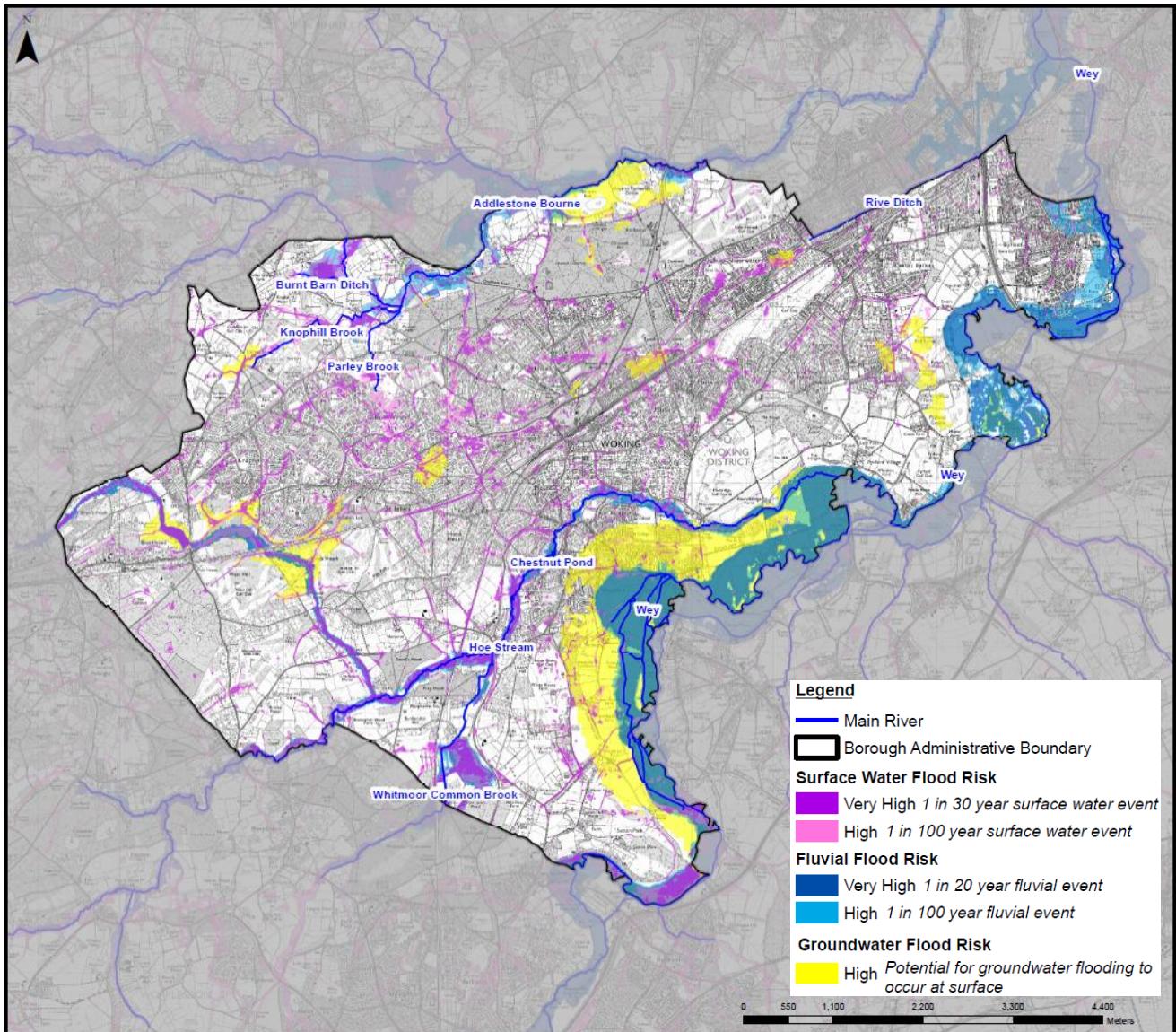


Figure 7-1 – Map showing the areas of the Borough at high risk of flooding

Note: Volume 3, Figure series14 provides more detailed maps showing the areas at high and very high risk of flooding across Woking Borough

The Functional Floodplain

The functional floodplain, flood zone 3b, has been defined as the land having a 1 in 20 year (5% AEP) or greater annual probability of river flooding, defined using detailed hydraulic modelling provided by the Environment Agency. Where the 5% AEP outline is unavailable, the Flood Zone 3a outline (1% AEP) has also been used to define Flood Zone 3b. The 5% AEP outline was available along the River Wey, the Addlestone Bourne and the Hoe Stream, from the detailed modelling studies. The smaller, unmodelled tributaries within the borough therefore have a more conservative flood zone 3b definition using the EA flood zone 3a outline. It has been assumed that the defended and undefended scenarios are the same along all of the watercourses, except along the Hoe Stream, where the defended scenario has been used.

The functional floodplain has been divided into the developed and undeveloped flood zone 3b using MasterMap data to define the developed areas as the building footprint. A simple clipping process has been



used at the extents of the flood zone 3b to define the developed areas. Flood Zone 3b - developed includes only the existing built footprint and not areas of open space within the developed areas.

There are likely to be developed sites within the Functional Flood Plain, where redevelopment is likely to continue to be proposed through windfall developments. Following application of the sequential and exception test, a Local Plan policy may consider allowing redevelopment of developed sites in the Functional Flood Plain when flood risk betterment, appropriate mitigation and risk management can be achieved and implemented. Delineating the Functional Floodplain into Developed and Undeveloped assists with this understanding.

In the case of site allocations, redevelopment of developed land within the Functional Flood Plain should only be considered when there are no reasonably available alternatives at less risk of flooding, and when the sequential and exception test has been passed. There should, however, be no increase in development vulnerability or intensification in use.

7.2 Preliminary Drainage Areas

Volume 2 Chapter 6 also identifies the areas which are likely to increase surface water flooding and highlights the areas particularly susceptible to surface water flooding, by identifying preliminary drainage areas and upstream and downstream catchments. These areas should be used to develop policies within the local plan for managing surface water runoff. These should be combined with new planning considerations for delivering SuDS.

7.3 Use of Emergency Plan in the Planning System

Outcomes from the SFRA should be addressed in the Multi Agency Flood Management Plan which may then be incorporated into a local emergency plan to major incident plan as seen appropriate. It is expected that the other professional partners including Local Authorities, the Environment Agency, fire service, police service and Health Authority will contribute to the flood management plan. This is an obligation under the civil contingencies act (July 2004).

The Multi-Agency Flood Management Plan should:

- Identify the responsibilities of professional partners and others in the management of flood risk
- Identify the appropriate responses to flood warnings
- Identify the actions required during instigation of the plan
- Identify recovery actions following a flood event
- Identify clear communication routes between professional partners.
- The risk of isolation of residential areas
- The risk of flooding of major transport routes in and out of the study area

With the appropriate management of flooding taking increasing importance in the planning system, more developments will be required to ensure they appropriately manage their risks and do not exacerbate the risks to surrounding property and residents as a consequence of development. Whilst much of the impact of development should be mitigated against through appropriate proactive planning, (through application of the Sequential Test), there will remain some developments that will have to take place in areas at risk of flooding. In such circumstances, developments should be constructed in such a way as to protect them and their residents from flooding; however the impact of the development on the ability of emergency services to maintain current standards of service should also be considered.

Ensuring a robust emergency plan is in place will enable WBC to establish where a proposed development will place an unreasonable pressure on emergency services and may increase risks to the existing population. Similarly it will enable developers to incorporate appropriate mitigation measures into their developments to minimise the impact it will have on the existing emergency service provision.



7.4 Guidance for Developers

Although this SFRA has been undertaken for the Woking Borough area, it does not negate the need for site specific Flood Risk Assessments (FRAs) to be undertaken at the planning application stage. It is essential that Flood Risk Assessments submitted with development proposals take into account the findings of this SFRA and assesses flood risk from all sources, in line with the details in Policy CS9 of the Core Strategy.

Proposals should also demonstrate that safe access / egress to the development can be maintained during an extreme flood event and that development is set at an appropriate level so that the residual risks are managed to acceptable levels. Where the site falls within an area which is classified as being at High or Medium Residual Risk from all sources, as defined in the relevant chapters within Volume 2, the FRA should include a detailed assessment of the residual risks posed. Residual risk can occur when the existing defences are breached or overtapped by an event greater than the design event, or when breaching or overtopping of an artificial watercourse, (Basingstoke Canal) occurs.

Where the constraints to development are likely to be significant, developers should seek advice from the Council, the Environment Agency and Thames Water as to the specific requirements for assessment. Appendix B of this document provides further detailed guidance for the completion of detailed flood risk assessments and guidance on mitigation measures. A Site Specific Flood Risk assessment checklist is also available from PPG, and can be found at:

<http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/site-specific-flood-risk-assessment-checklist/>



8. Drainage of Development Sites

An objective of this Level 1 SFRA is to advise WBC on the principles, objectives and applicability of Sustainable Drainage Systems (SuDS) throughout the study area. As outlined in Chapter 4 of this document, the Local Planning Authority, in consultation with the LLFA, are responsible for the delivery of SuDS and it is likely that the operation and maintenance of SuDS will be adopted by WBC. The Department for Communities and Local Government (DCLG) has published revised planning guidance (Non Statutory Technical Guidance for the design, maintenance and operation of SuDS) in line with the policy changes.

8.1 What are SuDS?

SuDS are a varied collection of techniques designed to manage surface water in a sustainable manner. SuDS achieve this by seeking to manage surface water from new developments as close to its source as possible and by mimicking the surface water flow regime present on a site prior to development. Typically this approach involves a move away from conventional piped systems to softer engineering solutions inspired by natural drainage processes. All development must give priority to SuDS.

For SuDS to be fully sustainable they should seek to contribute to each of the three goals of sustainability (identified below), with the favoured system contributing equally to each goal. The three goals of sustainable drainage systems are:

- Reduce flood risk (to the site and neighbouring areas),
- Reduce pollution, and,
- Provide landscape and wildlife benefits.

In addition, SuDS should also be designed to ensure they remain effective for storm events up to and including the 1% annual probability storm event including an increase in peak rainfall intensities to account for the predicted effects of climate change.

SCC have prepared a SUDS Advice Note (April, 2015) which outlines the requirements for SUDS¹⁵. Some of these requirements are provided below:

- Infiltration rates are highly variable, refer to Environment Agency website to identify source protection zones (SPZ).
- Infiltration rates should be no lower than 1×10^6 m/s.
- Infiltration units must stand the test of half-emptying the provided storage within 24hrs for up to the 1 in 10yr return period storm (and that is for all rainfall duration events).
- Need 1m (min) between the base of the infiltration device & the water table to protect Groundwater quality & ensure GW doesn't enter infiltration devices. Avoid infiltration where this isn't possible.
- Water should not be infiltrated through land that is contaminated. The Environment Agency may provide bespoke advice in planning consultations for contaminated sites that should be considered.

8.2 SuDS Policies

Chapter 4 of this document outlines the policies that govern development and flood risk management in the WBC area. It is widely recognised that SuDS are a useful tool in the management of flood risk and water quality. As a result, the use of SuDS in individual planning applications should be promoted. As of April 6th 2015, SuDS will be a material planning consideration for development of ten dwellings or more, and equivalent non-residential schemes, unless developers can demonstrate that SuDS would not be appropriate.

¹⁵ http://www.surreycc.gov.uk/_data/assets/pdf_file/0011/52769/SuDS-Advice-Note.pdf



The changes within NPPG, require the inclusion of SuDS designs with all Major Developments planning applications. Full planning application are required to be accompanied by a detailed SuDS drainage design including simulation modelling of the proposed system, the SuDS pro-forma must be completed and signed by a competent drainage engineer and submitted as part of the planning application. The proposed drainage system shall be designed in accordance with the Non-Statutory Technical Standards for Sustainable Drainage Systems and the Woking Borough Sustainable Drainage Systems Design and Adoption Guide.

In accordance with PPG paragraph 80, all planning applications must follow the hierarchy for discharge destinations. Where it is not possible to achieve the first hierarchy, discharge through the ground, applicants must demonstrate in sequence why the subsequent discharge destinations were selected.

Where the intention is to dispose to soakaway, these should be shown to work through an appropriate assessment carried out under Building Research Establishment (BRE) Digest 365. All designs shall be based on actual infiltration figures obtained through percolation tests, carried out in accordance to BRE Digest 365.

In accordance with CIRIA Report 156, Infiltration Drainage and SuDS Manual (C697 or latest amended version C753), an adequate factor of safety must be applied to the observed infiltration value. The minimum factor of safety acceptable is 2 and that must be increased to reflect the consequences of failure of the system, the topography of the site and the likelihood of flooding.

Infiltration units must stand the test of half-emptying the provided storage within 24hrs for up to the 1 in 10 year annual probability storm (for all rainfall durations). The proposed infiltration devices shall not intercept the water table and shall have at least 1m of unsaturated ground between the base of the infiltration device and the water table. There should be no infiltration of water into contaminated land.

If infiltration is not viable, subject to evidence being provided to support the choice of discharge destination, proposals to dispose of surface water in to a watercourse, surface water sewer, highway drain or another drainage system, should be accompanied by evidence of the system having spare capacity downstream

All development must aim to achieve pre-development greenfield run-off rates. If this is not proposed evidence must be submitted demonstrating why it has not been possible to achieve the greenfield run-off rate and why it is only possible to achieve the proposed discharge rate.

From the 16 April 2015, Woking Borough Council will offer adoption for all new SuDS Features that meet the Woking Borough Council SuDS Adoption Criteria, set out within the Woking Borough Council SuDS Design and Adoption Guide. All Major planning applications will need to set out who will be responsible for maintaining and inspecting the drainage system for the lifetime of the development and include a detailed SuDS maintenance plan.

8.2.1 Building Regulations 2008 H3 Rainwater Drainage

The Building Regulations 2008 (Approved UK Building Regulations 2008) enable the principles of the NPPF to be enforced during construction by stipulating that:

1. Adequate provision shall be made for rainwater to be carried from the roof of the building;
2. Paved areas around the building shall be so constructed as to be adequately drained;
3. Rainwater from a system provided pursuant to sub-paragraphs (1) or (2) shall discharge to one of the following, listed in order of priority:
 - an adequate soakaway or some other adequate infiltration system; or, where that is not reasonably practicable,
 - a watercourse; or, where that is not reasonably practicable,
 - a sewer.



As the Environment Agency are the consenting authority for discharges to controlled waters (i.e. groundwater or watercourses), SuDS will be favoured for the removal of pollutants and attenuation of discharge rates.

8.2.2 WBC Core Strategy SuDS policy

As highlighted in Policy CS9 of the Core Strategy, all significant forms of development will require the incorporation of SuDS as part of any development proposals. The Council will require evidence illustrating that SuDS are not feasible if they are not included in the plan.

8.2.3 Environment Agency Policies

The Thames Catchment Flood Management Plan (Environment Agency, January 2007) also advocates policies relating to SuDS, these are:

- All sites greater than 1 hectare in size require the following:
 - SuDS,
 - Greenfield discharge rates,
 - Attenuation of the 1 in 100 year storm event including allowance for climate change.
- Allocated land should set-aside space for SuDS. All sites greater than 10 dwellings will require SuDS.



9. Future Flood Risk Management Practices

Current flood risk management practices within the WBC SFRA study area have been described in Volume 2, Chapter 3. This section describes the practices that are planned for the area or methods that can be incorporated into new developments.

9.1 Flood Defences and Maintenance

Volume 3, Figure series 3 identifies the flood defences and river management practices in place across Woking Borough. The Key defences are highlighted below:

- Along the Addlestone Bourne there are several sections of bank protection
- Along the Hoe Stream there are multiple levels of flood protection, including flood embankments, weirs, engineered channels and informal flood defences.
- Across the study area there are large areas protected by escarpments
- Channel maintenance occurs along many large stretches of the channels. Different flood risk management Authorities are recorded as responsible, including SCC, the EA and WBC. The Riparian owner is principally responsible for the maintenance of the channel.

It should be noted that hydraulic remodelling and a Project Appraisal Report is currently (Summer 2015) being undertaken for the River Wey. An options assessment for the future of the flood defences along the River Wey through Old Woking, Weybridge and Byfleet will determine the flood defence programme going forwards.

9.2 Flood Warnings

Ensuring people in areas of flood risk are aware of potential flooding is key to ensuring they are prepared, facilitating the protection of property and evacuation where necessary.

Flood Warning is an essential component of the strategy to reduce flood risk. The Environment Agency seeks to provide a flood warning service for flooding from rivers and the sea in areas where it is possible to do so. It consists of three flood warning codes – Flood Alert, Flood Warning and Severe Flood Warning that indicate the level of danger. The flood warnings are disseminated through a variety of mediums that include TV, radio, an automated voice messaging service direct to a phone/fax/pager, the Internet and/or loudhailer. There is also an emergency Floodline number (0345 988 1188) and a quick dial number for individual rivers.

Woking Borough is included as part of the Lower Wey Flood Alert area. The flood alert area of the River Wey is situated in a larger geographical area, as the warning area is smaller geographically than an alert area. However, the flood warning system only operates for fluvial flooding. A significant number of properties within urban areas of the study area at risk from surface water; most surface water flooding incidents are likely to occur without any warning due to the rapid onset.

Sir Michael Pitt's reviewⁱ of the summer 2007 floods stresses the importance of developing a flood warning system for surface water flooding. One of the reports interim conclusions (IC3) was "*the Environment Agency further develops tools and techniques for predicting and modelling river flooding, especially to take account of extreme multiple events; and takes forward work to develop similar tools and techniques to model surface water flooding.*" The flood forecasting centre was created to address this issue. There is a partnership between the Met Office and the Environment Agency, who issue weather warnings to help Risk Management Authorities (RMAs) prepare for severe weather.



9.3 Flood Alleviation Scheme Maintenance

The potential for flooding can be increased in areas where flood alleviation measures are not maintained regularly and/or adequately. Breaches in raised flood defences, for example, are most likely to occur where the defence has been degraded or not maintained to its design standard. Drainage infrastructure in urban areas can also frequently become blocked with debris which, if not removed, can lead to blockages in culverts and backing up of a watercourse resulting in flooding of property and infrastructure.

It is an essential aspect of flood risk management practise that all flood alleviation schemes and hydraulic structures are regularly maintained to a specified design standard. It is the responsibility of the riparian owner to maintain the watercourses or defences to a suitable standard. The Local Authority or Environment Agency has permissive powers to act should the riparian owner not satisfy their maintenance requirements.

9.4 Flood Mitigation on site

Flood mitigation measures can also be incorporated within a development and are usually more appropriate in areas of residual flood risk. The Pitt Review (Sir Michael Pitt, 2008) recognised the importance of flood resilient and resistant techniques and came to an interim conclusion (IC11) that "*no new building should be allowed in a flood risk area that is not flood-resilient, and that Government should work with organisations such as the Royal Institute of British Architects and the building industry to encourage flood-resilient building and development design.*"

There is a guide for Non-Domestic Buildings (CLG 2011). One credit is made available for developments in Flood Zone 2 or 3 and 2 credits are available for developments in Flood Zone 1.

When including flood avoidance (which should always be the first consideration through application of the Sequential Test) flood risk mitigation measures that can be employed on individual sites can be split into three categories:

- Flood Avoidance
- Flood Resistance
- Flood Resilience

9.4.1 Flood Avoidance

This is defined as: -

'Constructing a building and its surrounds (at site level) in such a way to avoid it being flooded (e.g. by raising it above the flood level, re-siting outside flood risk area etc.)'.

These are used to restrict the pathway between the flooding source and the receptor. The preferential option is to locate the building outside a flood risk area through rearranging the site layout if possible, alternatives within this category could include a permanent or temporary defence such as raised kerbs to contain and route flood water through a site or demountable barriers.

9.4.2 Flood Resistance

This is defined as:-

'Constructing a building in such a way to prevent floodwater entering the building and damaging its fabric'.

Floodwaters will enter buildings through the weakest points in the construction which maybe in the brickwork, party walls of terraced or semi-detached buildings, expansion joints between walls where different construction materials meet, vents, door thresholds, seepage from below ground through floors and basements and/or sanitary appliances from backflow from surcharged drainage systems.



Flood resistance techniques can be employed on buildings. For a new dwelling, finished floor levels for habitable areas must be 300mm above the 1 in 100 (1%) annual exceedance probability plus climate change flood level. Appropriate material that can withstand periodic flooding must be used. They include the use of low permeability materials in the construction of the building and are likely to only be effective for short duration flood events and of low flooding depths (less than 0.3 m). If it can be demonstrated to the satisfaction of the LPA that it is inappropriate to raise floor levels for development classified as 'Less vulnerable' then measure to prevent flood water entering a building may be appropriate.

They may be used in conjunction with flood resilience techniques when the predicted flood level is between 0.3 - 0.6 m.

9.4.3 Flood Resilience/Repairable

This is defined as:-

'Constructing a building in such a way that although floodwater may enter the building its impact is reduced (i.e. no permanent damage is caused, structural integrity is maintained and drying and cleaning is facilitated)'.

Flood resilience techniques are also employed on buildings within the floodplain. This type of approach is often more appropriate when the predicted depth of flooding is greater than 0.3 m or flooding is expected to last for a long time. In these cases the use of more durable materials that will not be easily damaged by floodwaters as well as the use of construction materials that are more effective at draining and drying are recommended. Flood resilience techniques are only suitable for new developments that are classified as 'Less Vulnerable'.

There is currently no guidance within the UK Building Regulations for appropriate means of construction for properties in flood risk areas. For more information on flood resistant construction refer to the Communities and Local Government publication 'Improving the Flood Performance of New Buildings: Flood Resilient Construction' (May, 2007).



10. SFRA Maintenance and Management

10.1 Data Collection

An objective of this Level 1 SFRA is to collate and review the information available relating to flooding in the study area and present this in a manner that allows WBC to apply the Sequential Test.

This section describes the data collection process, and presents the available data. A comprehensive record of all the available data collected through the production of the Level 1 SFRA is presented in a document register in Appendix A. All of the data was registered on receipt and reviewed to assess its contribution to the Level 1 SFRA.

The information presented in this Level 1 report should not be considered as an exhaustive list of all available flood related data for the study area. The Level 1 SFRA report is a presentation of the data collected following consultation with and input from the partnering local authorities and agencies within the timeframe available.

The Level 1 SFRA assessment methodology is based on using available existing information and data where suitable. As a result, there has been no new investigation undertaken for this Level 1 SFRA.

10.1.1 Stakeholders

The information used in this SFRA has been sourced from a variety of stakeholders including

- Woking Borough Council - the Local Planning Authority
- Surrey County Council - the Lead Local Flood Authority
- Environment Agency – responsible for all Main Rivers in Woking Borough
- Basingstoke Canal Authority
- Thames Water - Thames Water is responsible for the management of surface water and foul water sewers in the study area
- British Geological Survey – Geological data used to derive SUDS suitability maps and susceptibility to groundwater data set.

It is recommended that during future iterations of the SFRA, the above organisations are contacted to ensure that the most up-to-date records are included in the SFRA.

10.2 Data Processing

The following data processing was undertaken during the development of the SFRA:

- Historic records of flooding were assessed to determine source of flooding and GIS layers were compiled.
- Maps and figures were produced using map templates designed for the SFRA report.
- Analysis to identify areas where additional development may significantly increase flood risk elsewhere was carried out using topographic data combined with the UFMfSW and Water Framework Directive outlines.



10.3 Data Ownership

The datasets obtained for use in the SFRA have come from a number of sources, as outlined in Appendix A, under licence agreement. These datasets cannot be passed to external sources without permission from the owner and those requiring the data should ensure that they possess the appropriate copyrights and access. WBC should be aware of the IPR they possess so that they only issue data that is contractually appropriate. Datasets produced during the SFRA are owned by Woking Borough Council and can be passed to external parties at their discretion. Other datasets are the property of the EA and should not be released by WBC.

10.4 SFRA Data Management System

The data management strategy developed for the SFRA is designed to account for likelihood that external parties will seek to make use of the information within the SFRA in preparing flood risk assessments and assessing sites. The SFRA is also a “live” document, and as such it is necessary to ensure at regular intervals in the future that the information within it remains valid.

The final deliverables of the SFRA are delivered in two forms:

- Digital copies of the SFRA reports – the SFRA contents are divided into several volumes and chapters to allow easier update during future iterations.
- Electronic datasets including:
 - Raw GIS data - SFRA flood outlines and additional GIS data layers used to produce the SFRA maps and figures. Some of these were obtained under licence from the Environment Agency. All data is provided in a format compatible with Woking Borough Council’s existing corporate GIS infrastructure.
 - Electronic document management system - PDF versions of all maps and reports produced during the SFRA

To ensure that the SFRA remains ‘live’ it is important to nominate a Management Group with responsibility for monitoring, managing and maintaining the SFRA, as shown in Figure 7.1. It is recommended that the monitoring of the SFRA is linked to the Borough’s LDF Annual Monitoring report.

By following this process of information dissemination and review, the management team can ensure a consistent and up to date supply of strategic flood risk information to all levels of planning process.

10.4.1 Monitoring the SFRA

To ensure that the SFRA remains ‘live’ it is important to nominate a Management Group with responsibility for monitoring, managing and maintaining the SFRA, it is recommended that the following maintenance checks be undertaken on a regular basis and if necessary meetings arranged with the relevant organisations:



Has any flooding been observed within the Borough since the previous review?

If so, the following information should be captured as an addendum to the SFRA:

- What was the mapped extent of the flooding?
- On what date did the flooding occur?
- What was the perceived cause of the flooding?
- If possible, what was the indicative statistical probability of the observed flooding event? (I.e. how often, on average, would an event of that magnitude be observed within the District?)

Have any amendments to NPPF or the Practice Guidance been released since the previous review? Does the revision to the policy guidance alter the definition of the Flood Zones presented within the SFRA?

- Does the revision to the policy guidance alter the decision making process required to satisfy the Sequential Test?
- Does the revision to the policy guidance alter the application of the Exception Test?
- Does the revision to the policy guidance alter the categorisation of land use vulnerability, presented within the NPPG, 2014?

Has the implementation of the SFRA within the spatial planning and/or development control functions of the Council raised any particular issues or concerns that need to be reviewed as part of the SFRA process?

If so; consider updating the SFRA.

Has the Environment Agency issued any amendments to their flood risk mapping and/or standing guidance since the previous policy review?

If so:

- Has any further detailed flood risk mapping been completed within the District, resulting in a change to the 20 year, 100 year or 1000 year flood outline? If yes, then the Zone 3b and Zone 3a flood outlines should be updated accordingly.
- Has the assessment of the impacts that climate change may have upon rainfall and/or river flows over time altered? If yes, then a review of the impacts that climate change may have upon the District is required.
- Do the development control recommendations provided in Section 9 of the SFRA in any way contradict emerging EA advice with respect to (for example) the provision of emergency access, the setting of floor levels and the integration of sustainable drainage techniques? If yes, then a discussion with the EA is required to ensure an agreed suite of development control requirements are in place.
- Have any new/updated surface water or other sources of flooding maps been produced and published?

Whilst all datasets should be checked for updates and key organisations contacted, Table 10-1 contains a list of datasets that are likely to be updated regularly.

**Table 10-1:** Datasets that are known to be updated regularly

| Dataset | Owner | Comment |
|---|--|--------------------------|
| Flood Zones | Environment Agency | Updated quarterly |
| Catchment Flood Management Plans | Environment Agency | Updated every five years |
| National Flood and Coastal Defence Database (NFCDD) | Environment Agency | Ongoing updates |
| Historic flood incidents | Environment Agency, Water companies, Fire Brigade, Highways Dept WBC. | Unknown |

10.4.2 Incorporating New Datasets

The following tasks should be undertaken when including new datasets in the WBC SFRA:

- Identify new dataset.
- Save new dataset/information.
- Record new information in log so that the next update can review this information.

10.4.3 Updating SFRA reports and Figures

Volume 2 provides a record of all of the technical analyses used to develop the Woking Borough SFRA. In recognition that the SFRA will be updated in the future, the report has been structured in chapters according to the sources of flooding investigated. By structuring the report in this way, it is possible to undertake further analyses on a particular source of flooding and only have to supersede the relevant chapter, whilst keeping the remaining chapters unaffected.

In keeping with this principle, the following tasks should be undertaken when updating SFRA reports and figures:

- Undertake further analyses as required after SFRA review
- Document all new technical analyses by rewriting and replacing relevant Volume 2 chapter/s.
- Amend and replace relevant SFRA Maps in Volume 3.
- Review and if required, amend Chapter 1 of Volume 1.
- Reissue to departments within Woking Borough Council and other stakeholders.



11. Conclusions and Recommendations

11.1 Summary of Flood Risk in Woking

This updated SFRA has reassessed the sources of flood risk within Woking Borough, using updated Policy and datasets, maintaining a 'live' document. This SFRA will provide a more up to date evidence base for WBC should the need arise to update the policies within the Local Plan and Core Strategy.

A summary of flood risk from all sources across the Borough have been identified throughout Volume 2 of this SFRA. A summary of this information is present in Table 11-1 below.

Table 11-1 – Summary of flood risk from all sources of flooding

| Type of Flood Risk | Summary | Further information |
|--------------------|---|-------------------------|
| Fluvial | Modelled and historic flood extents indicate higher risk along floodplains of Wey, Hoe Stream and Whitmoor Common Brook. Defences modelled along Hoe Stream have significantly reduced flood risk. | Volume 2 Section 4.3 |
| Surface Water | Historically affected areas include Maybury, Byfleet, Old Woking and several roads (particularly Blackhorse Road), which are indicated as at higher risk. Modelling shows areas of Maybury and Sheerwater, Horsell and Goldsworth East at higher risk. | Volume 2 Section 5.3 |
| Sewers | Highest number of historical events in Old Woking and West Byfleet. Higher risk areas are the densely populated wards of Goldsworth West, Maybury and Sheerwater and Mount Hermon. | Volume 2 Section 7.3 |
| Groundwater | Highest groundwater flooding susceptibility in Old Woking and Pyford, where superficial river gravel deposits exist along the Wey floodplain. Parts of central Woking adjacent to Basingstoke Canal also at increased risk. No historic incidents. | Volume 2 Section 8.3 |
| Artificial Sources | Overall low, as breaching embankments unlikely. In situation, Basingstoke Canal is the highest flood risk source in the area, potentially flooding parts of central Woking. Sutton Place lake has minimal flood extent affected several farms in southern Woking Borough. | Volume 2 Section 9.3 |

11.2 Policy Recommendations

The SFRA makes the following recommendations, outlined in Table 11-2, which should be considered when developing policies and using the SFRA. The recommendations have been divided into categories associated with each type of flood risk. The organisations likely to be involved in implementing the recommendations have been identified also. The Woking Borough Council Local Plan and other users of the SFRA need to take into consideration the recommendations within this SFRA. It is important to



recognise that the allocation of sites for future developments can impact flood risk and should be managed carefully.

Table 11-2 – General Recommendations

| | General Recommendations | Organisation |
|---|---|--------------------------|
| 1 | On watercourses that have not been included within detailed river models, and as such do not have a defined Flood Zone 3b. That is 'all areas within Flood Zone 3 should be considered Flood Zone 3b(Functional Floodplain) unless or until, an appropriate FRA shows to the satisfaction of the EA that it can be considered as falling within Flood Zone 3a (High Probability). | WBC EA Developer |
| 2 | It is recommended that policies are developed such that development must not increase flood risk from all sources in the surrounding area. | WBC |
| 3 | It is recommended that WBC liaise with Guildford BC, Runnymede BC and Elmbridge BC regarding development policies in their boroughs, to ensure flood risk is not increased along the Wey Valley. | WBC GBC RBC EBC |
| 4 | It is recommended that WBC liaise with Surrey Heath BC regarding development policies in the boroughs, to ensure flood risk is not increased in the Addlestone Bourne catchment. | WBC SHBC |
| 5 | It is recommended that information on all sources of flooding continues to be collected and where possible more resources are invested in documenting flooding incidents and determining the source of flooding | WBC Landowners |
| 6 | Due to limitations and lack of information available on other sources of flooding; and in some cases the local nature of problems it is recommended that these issues are considered in detail on a site by site basis. | WBC Landowners EA |

Table 11-3 – River Flooding Recommendations

| | River Flooding | Organisation |
|---|--|-------------------------|
| 1 | Results of updated hydraulic modelling and hydrological studies should be incorporated into future updates of the SFRA | WBC EA |
| 2 | Where limitations in data or the scale of assessment have been identified, information should be improved through more detailed study. Where modelling is carried out as part of an FRA, results should be captured by WBC to inform the SFRA. | WBC EA Developers |
| 3 | Results of the Rive Ditch Modelling Study should be considered and included in updates of the SFRA. | WBC EA |

Table 11-4 – Surface Water Flooding Recommendations

| | Surface Water Flooding | Organisation |
|---|--|--------------|
| 1 | Policies should be developed to ensure that appropriate surface water management and mitigation is provided for developments. Where possible, surface water runoff rates should be reduced to greenfield runoff rates as per the core strategy Policy CS9 and the Non-statutory standards for Sustainable drainage Systems S5. Discharge Rates should also be to Greenfield as per S3 within the Non-statutory Technical standards and Core Strategy Policy CS9. | WBC SCC |



| | | |
|---|---|-----|
| 2 | WBC should engage in its responsibility to promote and deliver the use of SuDS within new and re- developments. | WBC |
|---|---|-----|

Table 11-5 – Groundwater Flooding Recommendations

| | Groundwater Flooding | Organisation |
|---|---|---------------------|
| 1 | It is recommended that a policy is developed regarding areas at risk of groundwater flooding taking into consideration the limitations of the assessment made in the SFRA and available data. It may be appropriate for FRAs to complete more detailed groundwater analysis, given the local nature of this source of flooding. | WBC Developer |

Table 11-6 – Flooding from Artificial Sources Recommendations

| | Artificial Sources of Flooding | Organisation |
|---|---|---------------------|
| 1 | It is recommended that the council consult with the Environment Agency and the Basingstoke Canal Authority to agree policies for development at risk from canal breach, this may include agreeing raised floor levels, or developing evacuation plans | WBC BCA EA |
| 2 | It is recommended that FRAs for developments at risk of flooding from breach of the canal consider this in their assessment. | WBC Developers |
| 3 | It is recommended that the council consult with the Environment Agency to agree appropriate policies for development adjacent to artificial water bodies where there is a risk of flooding | WBC |

Table 11-7 – Recommendations on keeping the SFRA ‘live’

| | Maintenance and Management of the SFRA | Organisation |
|---|--|-----------------------------|
| 1 | It is recommended that the SFRA is updated to ensure it remains a robust and current document. Therefore it is further recommended the SFRA Management and Maintenance strategy is adopted. | WBC |
| 2 | Information from site level FRAs will be submitted to the councils and the Environment Agency as part of the development control process and this information should be used to inform the SFRA in the future. | Developers EA WBC |
| 3 | It is likely that the council will receive multiple requests for copies of the SFRA, it is therefore recommended that the SFRA is made available for viewing and download through the council webpage. | WBC |
| 4 | It is important the liaison is maintained between the Local Authority, Thames Water, the Environment Agency, Highways Agency, and other stakeholders to work towards sustainable management of flood risk now and in the future. | WBC EA TW EA HA |



12. References

- National Planning Policy Framework. Department for Communities and Local Government (March 2012)
- Planning Practice Guidance: Flood Risk and Coastal Change. Department for Communities and Local Government (March 2014)
- Thames Catchment Flood Management Plan: Summary Report. Consultation Environment Agency, Bristol (December 2009)
- Surrey County Council Preliminary Flood Risk Assessment (June 2011)
- Surrey County Council Local Flood Risk Management Strategy (2012)
- Lower Wey Remodelling Flood Study Modelling Report. Mott MacDonald (December 2009)
- River Blackwater Flood Study Final Flood Mapping report. Peter Brett Associates (August 2007)
- Blackwater Tributaries Flood Risk Mapping Study, Environment Agency (2012)
- River Wey Flood Mapping Study. Atkins (February, 2006)
- Living with Environmental Change. study led by NERC (2013)
- Living on the Edge, Environment Agency (2014)
- Strategic Environmental Assessment and Sustainability Appraisals for Local Plans, PPG, 2014
- Designing for Exceedance in Urban Drainage – good practice (C635). CIRIA (May 2006)
- Planning for SuDS – making it happen (C687). CIRIA (December 2010)
- The SUDS Manual (C697D). CIRIA (March 2007)
- Site Handbook for the Construction of SuDS (C698D). CIRIA (February 2007)
- Guidance on the Permeable Surfacing of Front Gardens. Department for Communities and Local Government (May 2009)
- Promoting Sustainable Drainage Systems: Design Guidance for Islington. Robert Bray Associates Ltd, Islington Borough (March 2012)
- Sustainable Drainage Systems (SuDS) – an introduction. Environment Agency (May 2003)
- Floods Review. Sir Michael Pitt (2008) (<http://www.cabinetoffice.gov.uk/thepitreview.aspx>)
- Flood Risk Standing Advice (March 2014) for local Planning Authorities (<https://www.gov.uk/flood-risk-standing-advice-frsa-for-local-planning-authorities>)



13. Glossary

| Term | Definition |
|-------------------------------------|--|
| Alluvium | Sediments deposited by fluvial processes / flowing water |
| Annual Exceedance Probability (AEP) | The probability of an event occurring within any one given year. |
| Attenuation | In the context of this report - the storing of water to reduce peak discharge of water |
| Aquifer | A source of groundwater comprising water-bearing rock, sand or gravel capable of yielding significant quantities of water. |
| Breach | An opening – For example in the sea defences |
| Brownfield | Previously developed land, usually of industrial land use within inner city areas. |
| Catchment Flood Management Plan | A high-level planning strategy through which the Environment Agency works with their key decision makers within a river catchment to identify and agree policies to secure the long-term sustainable management of flood risk. |
| Culvert/culverted | A channel or pipe that carries water below the level of the ground. |
| Drift Geology | Sediments deposited by the action of ice and glacial processes |
| EA Flood Zone 1 | Low probability of flooding |
| EA Flood Zone 2 | Medium probability of flooding. Probability of fluvial flooding is 0.1 – 1%. Probability of tidal flooding is 0.1 – 0.5 % |
| EA Flood Zone 3a | High probability of flooding. Probability of fluvial flooding is 1% (1 in 100 years) or greater. Probability of tidal flooding is 0.5%(1 in 200 years) |
| EA Flood Zone 3b | Functional floodplain |
| Estuary | A tidal basin , where a river meets the sea, characterised by wide inlets |
| Exception Test | The exception test should be applied following the application of the Sequential Test. Conditions need to be met before the exception test can be applied. |
| Flood defence | Infrastructure used to protect an area against floods as floodwalls and embankments; they are designed to a specific standard of protection (design standard). |
| Floodplain | Area adjacent to river, coast or estuary that is naturally susceptible to flooding. |
| Flood Resilience | Resistance strategies aimed at flood protection |
| Flood Risk | The level of flood risk is the product of the frequency or likelihood of the flood events and their consequences (such as loss, damage, harm, distress and disruption) |
| Flood Risk Assessment | Considerations of the flood risks inherent in a project, leading to the development actions to control, mitigate or accept them. |
| Flood storage | A temporary area that stores excess runoff or river flow often ponds or reservoirs. |
| Flood Zone | The extent of how far flood waters are expected to reach. |
| Fluvial | Relating to the actions, processes and behaviour of a water course (river or stream) |
| Fluvial flooding | Flooding by a river or a watercourse. |
| Freeboard | Height of flood defence crest level (or building level) above designed water level |
| Functional Floodplain | Land where water has to flow or be stored in times of flood. |
| Freeboard | Height of the flood defence crest level (or building level) above designed water level. |
| GIS | Geographic Information System – A mapping system that uses computers to store, manipulate, analyse and display data |
| Greenfield | Previously undeveloped land. |
| Groundwater | Water that is in the ground, this is usually referring to water in the saturated zone below the water table. |
| Highly Vulnerable Developments | Developments that are at highest risk of flooding. |
| Hydraulic Modelling | A computerised model of a watercourse and floodplain to simulate water flows in rivers too estimate water levels and flood extents. |
| Hydrodynamic Modelling | The behaviour of water in terms of its velocity, depth and hazard that it presents. Infiltration The penetration of water through the grounds surface. |
| Infrastructure | Physical structures that form the foundation for development. Inundation Flooding. |
| LiDAR | Light Detection And Ranging – uses airborne scanning laser to map the terrain of the land. |
| Local Development | The core of the updated planning system (introduced by the Planning and |



| | |
|-------------------------------|---|
| Framework (LDF) | Compulsory Purchase Act 2004). The LDF comprises the Local Development Documents, including the development plan documents that expand on policies and provide greater detail. The development plan includes a core strategy, site allocations and a proposals map. |
| Local Planning Authority | Body that is responsible for controlling planning and development through the planning system. |
| Main River | Watercourse defined on a 'Main River Map' designated by DEFRA. The environment Agency has permissive powers to carry out flood defence works, maintenance and operational activities for Main Rivers only |
| Mitigation measure | An element of development design which may be used to manage flood risk or avoid an increase in flood risk elsewhere. |
| Overland Flow | Flooding caused when intense rainfall exceeds the capacity of the drainage systems or when, during prolonged periods of wet weather, the soil is so saturated such that it cannot accept any more water. |
| Overtopping | Water carried over the top of a defence structure due to the wave height exceeding the crest height of the defence. |
| Reach/ Upper reach | A river or stream segment of specific length. The upper reach refers to the upstream section of a river. |
| Residual Flood Risk | The remaining flood risk after risk reduction measures have been taken into account. |
| Return Period | The average time period between rainfall or flood events with the same intensity and effect. |
| Risk | The probability or likelihood of an event occurring. |
| River Catchment | The areas drained by a river |
| SAR | Synthetic Aperture Radar - a high resolution ground mapping technique, which uses reflected radar pulses. |
| Sequential Test | Aims to steer development to areas of lowest flood risk. |
| Sewer flooding | Flooding caused by a blockage or overflowing in a sewer or urban drainage system. |
| Solid Geology | Solid rock that underlies loose material and superficial deposits on the earth's surface |
| Source Protection Zone | Defined areas in which certain types of development are restricted to ensure that groundwater sources remain free from contaminants. |
| Standard of Protection | The flood event return period above which significant damage and possible failure of the flood defences could occur. |
| Storm surge | A high rise in sea level due to the winds of the storm and low atmospheric pressure. |
| Sustainability | To preserve /maintain a state or process for future generations. |
| Sustainable drainage system | Methods of management practices and control structures that are designed to drain surface water in a more sustainable manner than some conventional techniques. |
| Sustainable development | Development that meets the needs of the present without compromising the ability of future generations meeting their own needs |
| Tidal | Relating to the actions or processes caused by tides. |
| Topographic survey | A survey of ground levels. |
| Tributary | A body of water, flowing into a larger body of water, such as a smaller stream joining a larger stream. |
| 1 in 100 year event | Event that on average will occur once every 100 years. Also expressed as an event, which has a 1% probability of occurring in any one year. |
| 1 in 100 year design standard | Flood defence that is designed for an event, which has an annual probability of 1%. In events more severe than this the defence would be expected to fail or to allow flooding. |



Appendix A – Data Register

| Data | Description | Date Provided | Owner / Author | |
|---|---|--|--------------------|--------------------|
| Hydraulic Models and Reports | Addlestone/Hale Bourne Flood Mapping Study | Study undertaken by Mott Macdonald for the Environment Agency in 2007. Package includes hydrology report, modelling report, figures, appendices and extents. | January 2015 | Environment Agency |
| | Lower Wey Remodelling Flood Study | Study undertaken by Mott MacDonald for the Environment Agency in 2009. Package includes hydrology and modelling reports, appendices and extents. | January 2015 | Environment Agency |
| | Hoe Stream Modelling Report | Study undertaken by CH2M Hill for the Environment Agency in 2014. Package Includes modelling report and extents. | January 2015 | Environment Agency |
| Flood Alleviation Schemes | Existing and proposed flood alleviation schemes through Woking. | January 2015 | Environment Agency | |
| Historic Property Flooding Incidents | Flooded property database identifying location, date and source where possible. | February 2015 | Environment Agency | |
| Reservoir Flood Outline | GIS outlines showing the extent of flooding in case of reservoir breach. | February 2015 | Environment Agency | |
| Thames Catchment Flood Management Plan (CFMP) | Composed by the Environment Agency in December 2009, outlines flood risk and subsequent management strategies across the West Thames catchment. | February 2015 | Environment Agency | |
| Winter Flood Report | Report identifying causes of and areas affected by flooding during winter 2013-2014. | February 2015 | Environment Agency | |
| Groundwater Level Data | Level data for seven sites across the Woking and Surrey Heath Boroughs. | February 2015 | Environment Agency | |
| Asset Data | Package includes AIMS defences and structures, | February 2015 | Environment Agency | |



| | | | |
|---|--|---------------|---|
| | recorded asset failures and maintenance of the watercourse. | | |
| Historic Flood Events | GIS outlines showing recorded outlines and proposed sources. | January 2015 | Environment Agency |
| LiDAR Topographic Data | DTM showing the elevation of the ground across WBC | March 2015 | Woking Borough Council |
| Recorded Flood Outlines | GIS outlines showing recorded outlines and proposed sources. | February 2015 | Woking Borough Council |
| Watercourses (EA Main River) | Watercourses GIS layer, line data at 1:10000 scale. | February 2015 | Woking Borough Council |
| Detailed River Network | Minor watercourses recorded as line data in GIS layer. | February 2015 | Woking Borough Council |
| Flood Map | GIS outlines of Flood Zone 2, Flood Zone 3 and defences. | February 2015 | Woking Borough Council |
| Historic Flood Map | GIS outlines showing extents of historic flooding and surface water flood events. | February 2015 | Woking Borough Council |
| Critical infrastructure | GIS datasets for EA defined National Receptors and Woking Borough key areas (developed areas, settlements, priority places). | February 2015 | Woking Borough Council |
| Mapping | OS Mapping GIS file (25k and 50k). | January 2015 | Woking Borough Council |
| Reservoir Information | GIS outline showing recorded water bodies in borough. | February 2015 | Woking Borough Council |
| Flood Incident Information | Reports identifying and analysing individual flood incidents. | February 2015 | Woking Borough Council |
| Flood Management Update | Report discussing flood risk incidents and improvement schemes. | February 2015 | Woking Borough Council |
| Woking local Development Document – Core Strategy | Public document | February 2015 | Woking Borough Website – weblink provided |
| Drainage Asset Information | GIS dataset of ditch locations. | February 2015 | Woking Borough Council |
| Surface water Drainage Systems information | Discussion regarding proposed scheme, referral to building project. | February 2015 | Woking Borough Website – weblink provided |
| Surface Water Management Plan | Draft preliminary SWMP for Woking and Byfleet area and associated | February 2015 | Woking Borough Council |



| | | | |
|-------------------------------------|---|---------------|------------------------|
| | figures showing flood risk, historic flooding from surface water and Thames Water Sewer networks. | | |
| Updated Flood Map for Surface Water | Second generation flood map for surface water generated from a digital terrain model. | February 2015 | Woking Borough Council |
| Basingstoke Canal Information | GIS datasets including canal corridor and trace. | February 2015 | Woking Borough Council |
| Ward Boundaries | GIS dataset of ward extents. | February 2015 | Woking Borough Council |
| Flood Alert Areas | GIS outlines showing Environment Agency Flood Alert Area catchments | February 2015 | Woking Borough Council |
| Flood Warning Areas | GIS outlines showing Environment Agency Flood Warning catchments | February 2015 | Woking Borough Council |
| Previous SFRA | Woking and Surrey Heath SFRA, Woking (River Wey) SFRA. | | Retrieved from server |
| Sewer Flooding Information | DG5 Extract for Surrey Heath Borough. | February 2015 | Thames Water |



Appendix B - Guidance for Developers

B.1 EA Guidance for Developers

The Environment Agency Guide for Developers (May 2013) provides a tool for developers to refer to during each development stage. The guide gives advice on how a development can be better for people and the environment.

At the Pre-Planning Application stage, the Environment Agency encourages developers to make enquiries on the Agency website that allows for a considered response. This stage of enquiries allows issues to be addressed such as; a lack of information in the application, if there is any more information available to help the application, and whether the application is likely to be refused. Pre-Planning Application Enquiries save the developer time and money, and make sure the development is better for the environment (Developers Guide, May 2013). Any bespoke pre-application advice from the Environment Agency will be chargeable.

The Environment Agency Pre-application enquiry form can be found at:

<https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion>

In addition to NPPF, the Guide for Developers provides advice on “Managing the risk of flooding” by ensuring the site land use and layout is appropriate to risk of flooding. This section of the guide also details/reiterates the government regulations set out by NPPF by stating the need for developers to “avoid causing flooding elsewhere”.

The Guide for Developers details the permissions needed for Flood Risk Management. The Water Resources Act 1991 and associated byelaws require the application for formal consent for works in, over, under or adjacent to main rivers. This is to ensure that these activities don’t cause flooding or make an existing flooding problem worse, and don’t damage the local environment, fisheries, wildlife, and flood defences. Main rivers are watercourses designated by Defra and are usually larger rivers or streams.

The EA Guide for Developers is available at:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/289894/LIT_2745_c8ed3d.pdf

A site-specific Flood Risk Assessment (FRA) will be required to demonstrate that flood risk to the development can be managed now and in the future, that the development will not increase the risk of flooding elsewhere and that the proposals are compliant with the SFRA. The requirement for site-specific FRAs is detailed in NPPF and the Planning Practice Guidance where there is a useful Site Specific Flood Risk Assessment Checklist. Planning applications for development proposals of 1 hectare or greater in Flood Zone 1 and all proposals for new development located in Flood Zones 2 and 3 require a FRA. The FRA should consider all sources of flooding, not just river flooding. For individual planning applications where there has been no sequential testing of the allocations in the development plan, or where the use of the site being proposed is not in accordance with the development plan, it will be necessary for developer to demonstrate that the Sequential Test has been applied (in accordance with the NPPF) within the FRA.

The principles and key requirements of a FRA are provided in Section 10 of PPG. Broad guidance on completion of FRAs in Woking Borough Council area is provided below.

Site Specific Guidance

Before commencement of a detailed site-specific FRA, a broad scale assessment of flood risk should be taken by the developer to ascertain the location and records of non-fluvial flood risk, shown in Volume 3.

Appendix I of the SFRA identifies areas which may be at risk in the event of a breach from the Basingstoke Canal, within these the developer may need to carry out their own assessment of residual



risk (criteria for breach analysis should be agreed with the planning authority who may take advice from the EA and the Basingstoke Canal Authority).

Once the Sequential Test has been applied in accordance with Section 5 of this SFRA and the NPPF and the local authority has considered the proposed development to have passed the Sequential Test and if required the Exception Test, a site-specific Flood Risk Assessment (FRA) should be carried out by the developer.

Developing a FRA

Flood risk is a fundamental consideration for any development project regardless of scale or type. Understanding the flood risk to and arising from a development is essential to managing the risk to people and property reducing the risk of injury, property damage or even death. Climate change is of particular concern to flood risk, with current predictions suggesting the UK will experience milder wetter winters and on average hotter drier summers, whilst sea levels will continue to rise. This will lead to an increase in rainfall and therefore flood events in winter months and increase the risk of thunderstorms in the summer months, as well as increasing the unpredictability of our weather.

Evidence collected through this Level 1 SFRA demonstrates flooding in the study area is not limited to just rivers (although it may be exacerbated by fluvial flooding). In fact flooding is proven to arise from a number of sources, each presenting their own type of risk and requiring management. In addition some areas currently defended from flooding may be at risk in the future as the effects of climate change take hold, as the condition of defences deteriorates with age, as defence strategies change or a combination of these causes.

A failure to adequately consider flood risk in development proposals can have significant implications for the planning and development processes and longer term on the residents of new or existing developments. Issues that may arise through inappropriate consideration of flood risk include:

- Failure to consider wider plans prepared by the Environment Agency or other operating authorities may result in an objection to a proposed scheme.
- Failure to identify flood risk issues early in a development project could result in failure of a development proposal, requiring redesign of the site to mitigate flood risk.
- Failure to adequately assess all flood risk sources and construct a development that is safe over its lifetime could increase the number of people at risk from flooding and/or increase the risk to existing populations.
- If an adverse effect can be demonstrated (i.e. flooding did not occur prior to development) by neighbouring properties or residents.
- Properties may be uninsurable and therefore effectively unable to be sold if flood risk management is not adequately provided for the lifetime of the development.

However, development can work with flood risk if it is accurately understood and managed. Using a sound understanding of flood risk to locate, and design developments enables flood risks to be managed through positive planning. This positive planning needs to consider the risks to a development from local flood sources but also the consequences a development may have on increasing flood risk. Early identification of flood risk constraints can ensure developments maximise development potential whilst achieving the principles of sustainability.

This Level 1 Strategic Flood Risk Assessment presents sufficient information to assist WBC to apply the 'Sequential Test' and identify where the Exception Test may be required. However, the scale of assessment undertaken for a Level 1 Strategic Flood Risk Assessment is typically inadequate to accurately assess the risks faced by a particular discrete development at a given location with the study area. This Level 1 SFRA has attempted to identify all sources of flood risk at the catchment and borough scale using the best available information. However, more local and site specific sources of flooding may become apparent during a Level 2 SFRA or during the course of a site specific FRA.



However, development can work with flood risk if it is accurately understood and managed. Using a sound understanding of flood risk to locate, and design developments enables flood risks to be managed through positive planning. This positive planning needs to consider the risks to a development from local flood sources but also the consequences a development may have on increasing flood risk. Early identification of flood risk constraints can ensure developments maximise development potential whilst achieving the principles of sustainability.

This Level 1 Strategic Flood Risk Assessment presents sufficient information to assist WBC to apply the 'Sequential Test' and identify where the Exception Test may be required. However, the scale of assessment undertaken for a Level 1 Strategic Flood Risk Assessment is typically inadequate to accurately assess the risks faced by a particular discrete development at a given location with the study area. This Level 1 SFRA has attempted to identify all sources of flood risk at the catchment and borough scale using the best available information. However, more local and site specific sources of flooding may become apparent during a Level 2 SFRA or during the course of a site specific FRA.

In addition, the information presented in the Level 1 SFRA does not necessarily fully address all the flood sources. For example, Flood Zones provided by the Environment Agency are not defined for all watercourses; typically watercourses with a catchment area less than 3km² are omitted from Environment Agency mapping unless there is a history of flooding affecting a population. Consequently there will be some locations adjacent to watercourses where on first inspection it is suggested there is no flood risk. This should be fully investigated to ensure more people are not placed at risk through inappropriate development.

Therefore, as part of the planning applications which come forward in future for both allocated and non-allocated sites, site specific FRAs will be required to assess the flood risk posed to individual discrete proposed developments and to ensure that where necessary, and appropriate, suitable mitigation measures are included in the development.

This section presents the recommendations for site specific FRAs, the circumstances under which they should be prepared and their requirements for submission with planning applications to WBC.

The site specific Flood Risk Assessment guidance presented in the following sections has been developed based on:

- The recommendations presented in NPPF and its accompanying Planning Practice Guidance;
- The Environment Agency's standing advice to LPAs
- A review of local policies and bye-laws throughout the study area; and,
- The information and findings gathered and developed during preparation of this Level 1 SFRA.

When are Flood Risk Assessments Required?

When informing developers of the requirements of a Flood Risk Assessment for a development site, consideration should be given to the position of the development relative to flood sources, the vulnerability of the proposed development and its scale.

In accordance with NPPF FRAs should always be provided with planning applications in the following situations:

- The development site is located in Flood Zone 2 or 3;
- The development site is equal or greater than 1 hectare in area in Flood Zone 1;
- The development site is located in Flood Zone 1 but the Environment Agency, Internal Drainage Board and/or other bodies have identified critical drainage problems;
- The development is located within 20m of any watercourse regardless of flood zone classification; or,



- The development involves any culverting operation or development which controls the flow of any river or stream.

The Environment Agency is a statutory consultee for planning applications that fall into the above situations with the exception of minor developments in flood zones 2 and 3. Minor development¹⁶ in relation to flood risk means:-

- minor non-residential extensions: industrial/commercial/leisure etc. extensions with a footprint less than 250 square metres.
- alterations: development that does not increase the size of buildings eg alterations to external appearance.
- householder development: For example; sheds, garages, games rooms etc. within the curtilage of the existing dwelling, in addition to physical extensions to the existing dwelling itself. This definition excludes any proposed development that would create a separate dwelling within the curtilage of the existing dwelling eg subdivision of houses into flats.

Minor developments are unlikely to raise significant flood risk issues unless:

- they would have an adverse effect on a watercourse, floodplain or its flood defences;
- they would impede access to flood defence and management facilities, or;
- where the cumulative impact of such developments would have a significant effect on local flood storage capacity or flood flows.

For minor development in Flood Zone 2 and 3 it is the responsibility of the LPA to determine the suitability of development against flood risk. In addition the LPA is also responsible for determining the suitability of development against other forms of flooding (identified through this Level 1 SFRA). In summary the LPA is responsible for determining the suitability of developments in the following situations:

- Development sites less than 1 hectare in area;
- Minor developments in Flood Zones 2 and 3; and,
- Developments at risk of flooding from flood sources other than fluvial or tidal (i.e. groundwater, surface water and infrastructure failures).

For developments in these situations the LPA must establish the requirements for FRAs and assess their suitability as part of the planning application.

Flood Risk Assessments Requirements

In general for all planning applications where a FRA is required under the NPPF it will be necessary to prepare a document to the satisfaction of the Environment Agency.

Although not as well defined as in PPS 25 the NPPF states “there should be iteration between the different levels of flood risk assessment”. Using the previous guidance in PPS 25 the following staged approach comprises of:

The staged approach comprises:

- Level 1 FRA - Screening Study
- Level 2 FRA - Scoping Study
- Level 3 FRA - Detailed Study

¹⁶ Planning Practice Guidance Flood Risk and Coastal Change, 2014



However it will not always be necessary to prepare each of the documents, in some cases where a site is known to flood it may be appropriate to prepare a Level 2 or 3 assessment directly.

The following outlines the minimum requirements for FRA at each stage in the process. These include:

- Considering the risk of flooding arising from the development in addition to the risk of flooding to the development;
- Consider, where possible the opportunity to reduce flood risk;
- Identifying and quantifying the vulnerability of the development to flooding from different sources and identify potential flood risk reduction measures;
- Assessments of the remaining 'residual' risk after risk reduction measures have been taken into account and demonstrate that this is acceptable for the particular development;
- The vulnerability of those that could occupy and use the development, taking account of the Sequential and Exception Tests and the vulnerability classification, including arrangements for safe access;
- Considering how the ability of water to soak into the ground may change with development, along with how the proposed layout of development may affect drainage systems.
- Fully account for current climate change scenarios and their effect on flood zoning and risk.

Where a particular element of the FRA cannot be achieved to the satisfaction of the EA or LPA it will be necessary to advance the next level of FRA.

Level 1- Screening Study

A Level 1 Screening Study is intended to identify if a development site has any flood risk issues that warrant further investigation. This should be based on existing information such as that presented in this Level 1 SFRA. Therefore this type of study could be undertaken by a development control officer in response to the developer query or by a developer where the Level 1 SFRA is available. Using the information presented in the Level 1 SFRA and associated GIS layers a development control officer could advise a developer of any flooding issues affecting the site. This information could then be used by the developer as a basis to further their understanding of how the flood risks could potentially affect their development.

Level 2 – Scoping Study

A level 2 Scoping Study is predominately a qualitative assessment designed to further understanding of how the flood sources affect the site and the options available for mitigation. The Level 2 FRA should be based on existing information to further a developers understanding of the flood risk and how it affects their development. This type of assessment should also be used to inform site master plans raising a developer's awareness of the flood management elements the proposed development may need to consider.

Level 3- Detailed Study

Where the quality and/or quantity of information for any of the flood sources affecting a site is insufficient to enable a robust assessment of the flood risks, further investigation will be required. For example it is considered inappropriate to base a flood risk assessment for a residential care home at risk of flooding from fluvial sources on Flood Zone maps alone. In such cases the results of hydraulic modelling are required to ensure details of flood flow velocity, onset of flooding and depth of flood water is fully understood and that the proposed development incorporates appropriate mitigation measures.

CAPITA

Capita Property and Infrastructure Ltd

www.capita.co.uk

CAPITA

Capita Property and Infrastructure Ltd

www.capita.co.uk