STRATEGIC FLOOD RISK ASSESSMENT - LEVEL 1

PREPARED FOR THE LONDON BOROUGH OF HARINGEY

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EXECUTIVE SUMMARY

The purpose of this Level 1 Strategic Flood Risk Assessment (SFRA) is to help the London Borough of Haringey (Haringey) make decisions about its New Local Plan, how to adapt to climate change and future flood management. In particular, this SFRA will provide a sound evidence base on flood risk to inform Haringey's New Local Plan, a key planning policy document that will cover the period 2022 to 2037. This SFRA supersedes Haringey's 2008 Level 1 SFRA, enabling the Haringey to be compliant with the latest policy requirements and guidance and to utilise the latest data to better assess flood risk.

Haringey borough (the borough) is subject to fluvial flooding from the River Lee, Pymmes Brook and Moselle Brook. The borough is particularly at risk from flooding along its eastern edge due to the River Lee and Moselle Brook. The borough is also at risk of flooding from other sources, including surface water, sewers, reservoirs and groundwater.

The SFRA provides a strategic overview of all forms of flood risk throughout the borough, now and in the future. This document, and the associated Web Mapping delivered as part of the SFRA, is designed to help address local requirements, manage development requirements, and manage the risk of flooding posed to residents, businesses and infrastructure. The local requirements addressed as part of this SFRA include climate change impacts, localised flood issues, and specific policies and interpretations of the Flood Zones.

The document is broken down into eight sections:

- **Section 1 (Introduction):** Purpose and objectives of the SFRA.
- **Section 2 (Planning and Policy Framework):** Relevant national, regional, and local policies relating to flood risk and associated requirements.
- **Section 3 (Data Sources and Mapping):** Data sources used to produce the web maps that form part of the SFRA.
- **Section 4 (Applying Climate Change to Risk Assessments):** How to apply the updated guidance and adapting to climate change.
- **Section 5 (Flood Risk in Haringey):** Flood risk from all sources across Haringey, including climate change implications where this information is available.
- **Section 6 (Flood Risk Assessment Guidance)**: Guidance for applicants undertaking Flood Risk Assessments (FRA) for proposed development sites. This section explains the requirements of the Sequential Test and Exception Test.
- **Section 7 (Flood Risk Management and Mitigation):** Flood risk mitigation and management recommendations for Haringey. Recommended site-specific and strategic policies.
- **Section 8 (Review and Next Steps):** Summary of the proposed update schedule for the SFRA (the technical content and mapping) and information on Level 2 SFRA requirements.

Future development and climate change are some of the key factors that are impacting the risk of flooding events across the UK and globally. Several key drivers, including significant planned urban development, could see an increase in flood risk from various sources. The pressure of accommodating new development may lead to a larger number being proposed for sites within higher risk Flood Zones, placing them at greater risk of flooding. The impact of development and projected future population growth may also present a greater overall risk to people and property due to the accumulative flood risk from each source.

To meet flood risk mitigation requirements whilst facilitating housing and other development needs at all scales, strategic policy is required to manage the impact of future growth and climate change on flood risk. It is recommended that Haringey develop and implement policy that encourages opportunities for a strategic flood risk management approach. This will enable Haringey and partnership organisations (including developers and water companies) to deliver and facilitate development. The SFRA will be updated following the release of updated river modelling from the Environment Agency, based on the revised climate change guidance on the Peak River Flow Allowances.

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GLOSSARY

Term	Definition
Aquifer	Underground layers of saturated rock through which water can readily move. Water can be transmitted to the surface via natural springs and wells.
Catchment	An area which drains to a specific watercourse, or a given point on a watercourse, waterbody or other body of water.
Critical Drainage Area	Specific geographic areas (usually catchment areas) that have been identified as having multiple and interlinked sources of flood risk (surface water, groundwater, sewer, main river and/or tidal) during heavy weather periods, leaving people, property and local infrastructure at risk. These areas are defined by a borough's Surface Water Management Plan (SWMP) and does not include areas with critical drainage problems as designated by the EA.
Development	Defined as one (or more) of the following: • Building operations, which includes structural alterations, construction, rebuilding, and most demolition. • Material changes of use of land and buildings. • Certain engineering operations such as groundworks. • Mining operations. • Other operations normally undertaken by a person carrying on a business as a builder. • Subdivision of a building (including any part) used as a dwelling for use as two or more separate dwelling houses.
Drainage Strategy	A report analysing surface water flood risk for the proposed site and the surrounding area. The strategy should analyse water behaviour around the site, establishing runoff rates, flow pathways and flood depths under different rainfall events. The strategy should also investigate the impacts that the proposed development will have on the site and provide measures to ensure the site is compliant with national and local policy requirements.
Dry Island	An area in Flood Zone 2 or 3 surrounded by land which has a higher risk of flooding.
Exception Test	Defined within the Flood Risk and Coastal Change Planning Practice Guidance, this is a method carried out for certain development sites following the application of the Sequential Test. The Exception Test is designed to demonstrate and help ensure that flood risk will be managed satisfactorily, while allowing necessary development to proceed in situations where suitable sites at lower risk of flooding are not available.
Flood Hazard	The danger or risk presented by flood risk sources to people and property as a function of both velocity and depth. It is presented as a 'hazard rating' for fluvial, tidal flood, and surface water risk. The risk to life posed by fluvial and tidal flood risk has been assessed and delineated in accordance with the DEFRA and EA guidance provided in the FD2321/TR1 The Flood Risks to People Methodology. The risk posed by surface water has been assessed and delineated in accordance with the EA's What is the Risk of Flooding from Surface Water Map guidance.
Flood Risk	A combination of the probability and the potential consequences of flooding from all sources. This includes flood risk from rivers and the sea, directly from rainfall on the ground surface (surface water runoff), rising groundwater, overwhelmed sewers and drainage systems, the overtopping of reservoirs, canals and lakes, and other artificial sources.
Flood Risk Assessment	A site-specific study to assess current and future flood risk for a proposed development area. The assessment should demonstrate how flood risk will be managed now and in the future during the lifetime of the proposed development.

Term	Definition
Flood Storage Compensation	Replacing floodplain storage lost through development by reducing nearby ground levels to provide more volume. Compensatory storage provided must equal or exceed the storage lost to reduce the chances of local or downstream flood risk increasing.
Flood Zone	A geographic area with a defined flood risk and accompanying designated annual probability of flooding, primarily from river ('fluvial') flooding or sea ('tidal') flooding. Flood Zone definitions are set by the National Planning Policy Framework, Flood Risk and Coastal Change Planning Practice Guidance and Local Planning Authorities.
Flood Zone 1	Defined in the Planning Practice Guidance as land that has a 'Low Probability' of fluvial or tidal flooding. There is a less than 1 in 1,000 (< 0.1%) annual probability of river or sea flooding.
Flood Zone 2	Defined in the Planning Practice Guidance as land that has a 'Medium Probability' of fluvial or tidal flooding. There is a 1 in 100 to 1 in 1,000 (1% to 0.1%) annual probability of river flooding, or a 1 in 200 to 1 in 1,000 (0.5% to 0.1%) annual probability of sea flooding.
Flood Zone 3	Defined by the Environment Agency as land that has a greater than 1 in 100 (> 1%) annual probability of river flooding, or a greater than 1 in 200 (> 0.5%) annual probability of sea flooding.
Flood Zone 3a (fluvial / tidal)	Defined as the following: • Land within Environment Agency modelled fluvial flood risk extents predicted for up to, and including, 1 in 100 year return period events. • Land within modelled tidal flood risk extents predicted for up to and including 1 in 200 year return period events
Flood Zone 3a (surface water)	Defined as the following (by this SFRA): • Land within Environment Agency modelled surface water flood risk extents predicted for up to and including 1 in 100 year return period events. See *Section 5.12.3* for additional information of Flood Zone 3a (surface water) as defined in this SFRA.
Flood Zone 3b (fluvial)	Defined as the following (by this SFRA): • Land within Environment Agency modelled fluvial flood risk extents predicted for up to and including 1 in 20 year return period events, allowing for the impact of flood defences. It also includes land featured as part of the Environment Agency's Flood Storage Areas dataset. See *Section 5.12.1* for additional information of Flood Zone 3b (fluvial) as defined in this SFRA.
Floodplain	An area of land which experiences flooding when flood management infrastructure exceeds capacity. In these times, water either flows over this area of land or is stored on them.
Greenfield Runoff Rate	The rate at which rainfall runs off from an undeveloped, naturally permeable site.
Lead Local Flood Authority	As defined in the Flood and Water Management Act (2010) as the unitary authority (or county council if there is no unitary authority) that leads in managing local flood risks. For further information, see *Table 5-1*.
Main River	A statutory type of watercourse designated as such by the Environment Agency. These watercourses tend to be larger rivers and streams but are not exclusively so. The Environment Agency has powers to carry out maintenance and operational works on these watercourses, including flood defence works.
Major Development	Defined in the Town & Country Planning (Development Management Procedure) Order 2015 as one of the following: • For residential developments, the provision of 10 or more dwellings, or a site of 0.5 hectares or more. • For non-residential development, new floorspace of 1,000m^2 or more, or a site of 1 hectare or more.

Term	Definition
	• Developments that use land for mineral-working deposits, or the winning and working of minerals. • A waste development.
Minor Development	For the purposes of planning applications, Minor Developments are defined as: • For residential developments, 1-9 dwellings, site area under 0.5. • For non-residential developments, total building floorspace is less than 1,000m^2, site area under 1 hectare. For the purposes of flood risk, Minor Developments are defined as: • Industrial/commercial/leisure etc extensions with a footprint less than 250 m^2. • Development that does not increase the size of buildings, e.g. alterations to external appearance. • Householder development within the curtilage of the existing dwelling (e.g. sheds, garages, games rooms), in addition to physical extensions to the existing dwelling itself.
Ordinary Watercourses	A watercourse that is not designated as a main river. It includes rivers, streams, land and roadside ditches, drains, cuts, culverts, dikes, sluices, some sewers (other than public sewers within the meaning of the Water Industry Act 1991) and passages, through which water flows.
Residual Risk	Defined in the Planning Practice Guidance as the risks that remain after applying the sequential approach and taking steps to mitigate against flood risk.
Risk Management Authorities	Defined within the Flood and Water Management Act (2010), these include Lead Local Flood Authorities, highway authorities, water and sewerage companies, plus the Environment Agency.
Sequential Test	Defined within the Flood Risk and Coastal Change Planning Practice Guidance, this is a sequential approach which aims to steer new development to areas with the lowest probability of flooding.
Strategic Flood Risk Assessment	A study carried out by one or more Local Planning Authorities to assess the risk of flooding from all sources, now and in the future, in a given geographical area. The Assessment takes into account the impacts of climate change and assesses the impact that development and land use changes in the area will have on flood risk.
Sustainable Drainage Systems	A sequence of measures and techniques designed to manage surface water runoff. The management practices and structures mimic natural processes to control flow rates, improve water quality, and improve water drainage and groundwater recharge.

Acronyms and Abbreviations

Abbreviation	Definition
AAP	Area Action Plan
CCAP	Climate Change Action Plan
CDA	Critical Drainage Area
CFMP	Catchment Flood Management Plan
CIL	Community Infrastructure Levy
DEFRA	Department for Environment, Food and Rural Affairs
DPD	Development Plan Document
EA	Environment Agency
EU	European Union
FCERM	Flood and Coastal Erosion Risk Management
FRA	Flood Risk Assessment
FRMP	Flood Risk Management Plan
FRMS	Flood Risk Management Strategy
FRR	Flood Risk Regulations (2009)
FWMA	Flood and Water Management Act (2010)
GLA	Greater London Authority
LFB	London Fire Brigade
LFRMS	Local Flood Risk Management Strategy
LLFA	Lead Local Flood Authority
LPA	Local Planning Authority
LSDAP	London Sustainable Drainage Action Plan
MHCLG	Ministry of Housing, Communities and Local Government
NLWP	North London Waste Plan
NPPF	National Planning Policy Framework
OAPF	Opportunity Area Planning Framework
PFRA	Preliminary Flood Risk Assessment
PPG	Planning Practice Guidance
RFRA	Regional Flood Risk Appraisal
RMA	Risk Management Authority
RoFSW	Risk of Flooding from Surface Water
S106	Section 106 (of the Town and Country Planning Act 1990)
SFRA	Strategic Flood Risk Assessment
SuDS	Sustainable Drainage Systems
SWMP	Surface Water Management Plan
TE2100	Thames Estuary 2100 Plan
TfL	Transport for London
TWUL	Thames Water Utilities Ltd.
UKCP	United Kingdom Climate Projections

1 INTRODUCTION

1.1 Objectives of the SFRA

The purpose of this Level 1 Strategic Flood Risk Assessment (SFRA) is to help the London Borough of Haringey (Haringey) make decisions about its New Local Plan, how to adapt to climate change and future flood management. In particular, the SFRA will provide a sound evidence base on flood risk to inform Haringey's New Local Plan, a key planning policy document that will cover the period 2022 to 2037. This document will provide a strategic overview for all sources of flood risk throughout Haringey borough (the borough). It will replace the previous Level 1 a SFRA completed in 2008. It will help to address local requirements, with associated web mapping delivered as part of the SFRA, including the following:

- Climate change impacts, which will incorporate recently published guidance and provide associated flood mapping for fluvial and tidal sources
- Specific policies and interpretations of the Flood Zones, including the incorporation of surface water flood risk into Flood Zone 3a

It is intended that this Level 1 SFRA will assist Haringey in improving its strategic approach to managing flood risk across the borough. This approach will be balanced with the challenges posed to the borough through the need for substantial amounts of new development.

1.2 Document Structure – User Guidance

The document is broken down into eight sections:

- **Section 1 (Introduction)**: Purpose and objectives of the SFRA.
- **Section 2 (Planning and Policy Framework):** Relevant national, regional, and local policies relating to flood risk and associated requirements.
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- **Section 8 (Review and Next Steps):** Summary of the proposed update schedule for the SFRA (technical content and mapping) and information on Level 2 SFRA requirements.

1.3 A Living Document

This SFRA is intended to serve as a 'living document'. For further information on reviews and updates for this SFRA see *Section 8.* The SFRA report is shaped by the latest legislation, policy, and flood risk information. Any new Acts, policy directives, or information that may impact flood risk management and planning decisions will be reviewed in accordance with the information currently presented in the SFRA. Following completion of this 2022 version, any updates made to the SFRA report will be documented as

required. The SFRA will be reviewed following the release of updated river modelling from the Environment Agency (EA), based on the revised climate change guidance on the Peak River Flow Allowances (See *Section 4*).

2 PLANNING AND POLICY FRAMEWORK

2.1 Overview

This section provides an overview of the policies, guidance, evidence base and legislation that are most relevant to flood risk in Haringey. National, regional, and local level policy is outlined, all of which have informed this SFRA.

Wherever possible, a hyperlink is provided for the referenced source material. Over time, the policies and documents referenced in this section may be superseded. It is advised that users of this document keep up to date with any changes to ensure that development proposals are in line with active policy, guidance and legislation.

2.2 National

2.2.1 National Planning Policy Framework

The revised NPPF was published in July 2021 by the Ministry of Housing, Communities and Local Government (MHCLG). It supersedes the previous revised NPPF which was published in February 2019 and the NPPF published in March 2012 and revised in July 2018.

The document outlines the Government's planning policies for England and how these are expected to be applied. The document provides a framework within which Local Planning Authorities (LPAs) can prepare plans for housing and other developments. It also provides guidance for prospective developers and applicants for planning application submissions. The NPPF revisions have been completed with the aim of improving and updating the plan-making process. Section 14 of the revised NPPF covers the need to meet the *"challenge of climate change, flooding and coastal change*". Paragraphs 159-169 specifically relate to "*Planning and flood risk*". Paragraph 160 highlights the importance of an SFRA and the role they should play in planning and flood risk:

"*Strategic policies should be informed by a strategic flood risk assessment, and should manage flood risk from all sources. They should consider cumulative impacts in, or affecting, local areas susceptible to flooding, and take account of advice from the Environment Agency and other relevant flood risk management authorities, such as lead local flood authorities and internal drainage boards.*"

Paragraphs 161 to 168 of the NPPF outline the Sequential and Exception Tests as a means of steering new development proposals to areas at the lowest risk of flooding. This SFRA provides the basis for applying these tests. Guidance for the application of the Sequential and Exception Tests can be found in *Section 6*.

Some of the key changes linked to planning and flood risk in the revised NPPF include:

- Paragraph 160 – Cumulative flood risk impacts – Strategic and planning policy on flood risk should consider cumulative flood risk impacts from all sources.
- Paragraph 161 – Adjusting for climate change and flood risk impacts – Local Plans should consider the current and future impacts of climate change. If it is expected that climate change may lead to an increase in flood risk, resulting in some existing development being less sustainable in the long term, opportunities should be sought to relocate the development.

- Paragraph 169 – Sustainable Drainage Systems (SuDS) in major developments – Major developments should incorporate SuDS as part of their drainage scheme proposals unless proof can be provided that it would be inappropriate. The proposed SuDS should have appropriate minimum operational standards and provide multifunctional benefits where possible. Drainage proposals for major developments are assessed by Lead Local Flood Authorities (LLFAs) through their statutory consultee role as defined in Written Ministerial Statement HCWS161.

On 12 March 2020, MHCLG published 'Planning for the Future', a policy paper outlining the Government's ambitions for housing and planning. The 12 March publication was accompanied by a statement from the Housing Secretary, Robert Jenrick MP, outlining 'plans for the future to get Britain building'. As part of the Government's 'green housing revolution', a future review of policy for building in areas at flood risk was announced, seeking to ensure that communities across the country know that future development will be safe from floods. The Government will assess whether current flood safeguarding protections in the NPPF are enough and consider options for further reform.

2.2.2 Flood Risk and Coastal Change Planning Practice Guidance

The 'Flood Risk and Coastal Change' section of the Planning Practice Guidance (PPG) was initially published in March 2014, and is intended to serve as a living document. Parts of the document have since been updated in accordance with the revised NPPF. The 'Flood Risk and Coastal Change' PPG operates in conjunction with the NPPF, defines flood risk and outlines certain Risk Management Authority (RMA) responsibilities for managing different sources of flooding.

It provides additional guidance and supporting information for LPAs on how to account for flood risk in preparation of the Local Plan and detail on what should be included as part of an SFRA. Specific detail is provided on how LPAs and prospective developers can assess, avoid, manage and mitigate against flood risk. Flood risk guidance from the Department for Environment, Food and Rural Affairs (DEFRA) is referenced as required throughout the report.

2.2.3 Flood and Water Management Act (2010)

The Flood and Water Management Act 2010 (FWMA) aims to provide an improved and effective method of managing flood risk across England and Wales. The FMWA defines the roles and responsibilities of RMAs in England and Wales, the bodies who manage flood risk from different flood sources. The Act defines the EA, LLFAs, District Councils (where there is no unitary authority), Internal Drainage Boards, Water & Sewerage Companies and Highway Authorities as RMAs. As an LLFA, Haringey has several responsibilities under the FWMA:

- Developing, maintaining and applying a Local Flood Risk Management Strategy (LFRMS)
- Maintaining a flood risk asset register
- Managing the risk of flooding from local sources (surface water, groundwater and ordinary watercourses)
- Investigating and recording key local flood incidents (Section 19)
- Regulation of works on Ordinary Watercourses
- Sharing of information about flood risk

Section 19 of the FWMA requires LLFAs to complete a flood investigation to the extent that it considers necessary or appropriate. After a significant flood event, the LLFA must determine which RMAs have flood risk management responsibilities and whether those RMAs exercised those responsibilities in the

flood event. The LLFA must also publish the results of the investigation and inform the relevant RMAs. Section 19 investigations which have been undertaken by Haringey are referenced in *Section 5.10*.

2.2.4 Flood Risk Regulations (2009)

The Flood Risk Regulations 2009 (FRR) translates the European Union's (EU) Floods Directive into law for England and Wales. The EU Floods Directive sets out a series of requirements to help make flood risk management more consistent across Europe.

The FRR set out duties for LLFAs and the EA, requiring the RMAs to produce Preliminary Flood Risk Assessments (PFRAs), flood risk maps which show flooding extents and hazards, and Flood Risk Management Plans (FRMP). These requirements are completed on a six-year cycle and enable England and Wales to meet their legal obligations under the EU Floods Directive 2007. Haringey published their PFRA in May 2011 with an addendum update in 2017. Further information on the PFRA can be found in *Section 2.4.9*.

The EA published their FRMP for the Thames River Basin District in March 2016. The document covers a six-year cycle period spanning from 2015 to 2021. Further information on the FRMP can be found in *Section 2.3.4.*

2.2.5 National Flood and Coastal Erosion Risk Management Strategy

The National Flood and Coastal Erosion Risk Management (FCERM) Strategy was published in July 2020. The Strategy is updated from the Draft National FCERM Strategy following a public consultation in 2019.

The National FCERM Strategy identifies climate change, and in turn the increased risk of flooding and coastal change, as a significant challenge. It outlines the Government's vision of "*a nation ready for, and resilient to, flooding and coastal change – today, tomorrow and to the year 2100*". It is a document that sets out the practical measures to be implemented by RMAs, partners and communities, which will contribute to longer term delivery objectives and the Government's vision. The next review for the Strategy is planned for 2026. The EA plan to review and update the shorter-term measures to ensure everything remains on track to support the Strategy's vision and longer-term objectives.

Alongside the final Strategy, the EA has developed an action plan for the Strategy's measures, published in May 2021. The action plan helps define what LLFAs and other RMAs will need to deliver and is intended to frame local action. The action plan reports against the progress of each proposed measure and the planned action for the measure in the future. From this, it is expected that Haringey's Local Flood Risk Management Strategy (see *Section 2.4.8*) will require an update.

2.2.6 Flood Risk Assessments: Climate Change Allowances

The EA published Flood Risk Assessments: Climate Change Allowances guidance in 2016. The guidance was produced for local planning authorities and developers. It provides information on how to apply climate change allowances to SFRAs, site-specific FRAs and planning applications. The guidance is updated periodically to capture the most recent climate change allowance guidance. More information can be found in *Section 4.*

2.2.7 Preliminary Flood Risk Assessment for England

The EA published a Preliminary Flood Risk Assessment (PFRA) for England in 2018. The report was produced under the FRR (See *Section 2.2.4*) and provides an FRA for river, sea and reservoir flooding throughout England. The document also identifies nationally significant flood risk areas. The Thames Region was identified as a high flood risk area, of which Haringey is included.

2.2.8 Catchment Based Approach: Improving the quality of our water environment

A catchment-based approach to flood risk management seeks to improve the water environment through an integrated approach. In 2013, DEFRA published Catchment Based Approach: Improving the quality of our water environment. The guidance document explains the purpose and implementation of a catchment- based approach and the ways in which DEFRA would support it. A catchment- based approach seeks to understand and evaluate the water environment on a catchment (watershed) level, as catchments are a natural scale to consider the water environment. This approach encourages collaboration between water managers to improve a catchment's water quality, understand water abstraction and discharge rates within the catchment, and reduce flood risk. The approach also encourages partnership working with the local community, to increase the local understanding of the water environment.

2.3 Regional

2.3.1 London Plan 2021

The London Plan is the Greater London Authority's (GLA) statutory spatial development strategy for London. It has been prepared in accordance with the Greater London Authority Act 1999. It sets out a unified economic, environmental, transport and social framework for development in London over the next 20-25 years. The London Plan was first published in 2004 and has undergone various alterations, reviews and replacements since. The current London Plan was published in March 2021, superseding the previous one which was published in March 2016.

Chapter 9 of the document covers 'Sustainable Infrastructure' and features several policies relating to climate change, flood risk and water management, including 'Policy SI 12 Flood risk management', 'Policy SI 13 Sustainable drainage' and 'Policy SI 17 Protecting London's waterways'. In addition, chapters covering 'Green Infrastructure and Natural Environment', 'Design', 'Spatial Development Patterns' and 'Planning London's Future – Good Growth' provide flood risk and water management guidance. A summary of the key policies relevant to this SFRA can be seen below:

- **Policy SI 12 Flood risk management** – The policy states that both current and expected flood risk from all sources across London should be managed in a sustainable and cost-effective way. This should be a collaborative effort between the EA, LLFAs, developers and infrastructure providers. It also sets out requirements for developments plans and development proposals.
- **Policy SI 13 Sustainable drainage** – The policy provides an updated drainage hierarchy (to that under the previous London Plan Policy 5.13) which development proposals need to adhere to when addressing surface water runoff. Proposals should aim to achieve greenfield runoff rates and manage surface water runoff as close to its source as possible, using the most sustainable solutions to reduce runoff volumes and rates. Development proposals should seek to include SuDS features to provide multiple benefits through their

drainage scheme. In addition, LFRMS and SWMP documents produced by LLFAs should identify areas where there are particular surface water management issues and aim to reduce these risks.

- **Policy SI 17 Protecting London's waterways** – The policy requires that new developments support river and watercourse restoration. It addresses the protection of water spaces and their characteristics, with a particular priority for improving and restoring them.
- **Policy GG6 Increasing efficiency and resilience** – The policy states that buildings and infrastructure should be designed to adapt to climate change, utilise water efficiently and reduce flooding impacts.
- **Policy SD2 Collaboration in the Wider South East** – The policy states that collaboration with LPAs beyond London's boundaries on related challenges and opportunities is important. It highlights the need for collaborative working with the wider South East region of the country to tackle issues related to climate change, including water management and flood risk.
- **Policy D11 Safety, security and resilience to emergency** – The policy states that proposals should maximise building resilience and minimise potential physical risks that may arise from various hazards, including those that are flood risk related.
- **Policy G1 Green Infrastructure** – The policy states that LPAs should prepare green infrastructure strategies to ensure that green infrastructure is optimised and integrated within the built environment. The green infrastructure approach includes assets which provide natural or semi-natural drainage feature elements.
- **Policy G5 Urban greening** – The policy states that major development proposals should contribute to the greening of London by incorporating features such as high-quality landscaping and nature-based sustainable drainage. It also states that boroughs should develop an Urban Greening Factor to identify the amount of greening required in new urban developments.

2.3.2 London Regional Flood Risk Assessment 2018

The London Regional Flood Risk Appraisal (RFRA), published in August 2018 by the GLA, is an accompaniment to the 2021 London Plan. The document provides a strategic overview of all sources of flooding in London and addresses its probability and consequences. This includes the potential consequences of flooding as London's population continues to grow. The findings of the London RFRA support information presented in the 2021 London Plan and shapes the London Plan's policies.

The London RFRA provides monitoring recommendations as a monitoring tool to be used on a borough- or London-wide level. Each recommendation focuses upon a different flood risk source or potentially impacted site type, as listed below:

- Recommendation 1 – Tidal Flood Risk
- Recommendation 2 – Fluvial Flood Risk
- Recommendation 3 – Surface Water Flood Risk
- Recommendation 4 – Sewer Flood Risk
- Recommendation 5 – Groundwater Flood Risk
- Recommendation 6 – Reservoir Flood Risk
- Recommendation 7 – Flood Risk to Opportunity Areas and Town Centres
- Recommendation 8 – Flood Risk to Transport Infrastructure
- Recommendation 9 – Flood Risk to Emergency Services

- Recommendation 10 – Flood Risk to Schools
- Recommendation 11 – Flood Risk to Utility Infrastructure

These monitoring recommendations are intended to improve local risk policies and Drain London activities (Drain London is a partnership group of key organisations that are responsible for managing surface water flood risk and drainage assets within London). These recommendations should be incorporated into future Haringey Local Plan policies and documents once finalised.

2.3.3 Thames Catchment Flood Management Plan 2009

The Thames Catchment Flood Management Plan (CFMP) was published in December 2009 by the EA. Its purpose is to provide an overview of the scale and extent of flooding now and in the future within the River Thames catchment area. The Thames CFMP also sets out the preferred plan and strategic policies to sustainably manage flood risks over the next 50 to 100 years with climate change in mind. Haringey lies within Sub-area 8 (see *Figure 2-1*), heavily populated floodplain. It falls within the Lower Lee sub-area, as the EA designated main river is a tributary of the River Thames that flows along the borough boundary. The preferred policy for Sub-area 8 is Policy 5 which states: "*Policy 5: Areas of moderate to high flood risk where we can generally take further action to reduce flood risk.*"

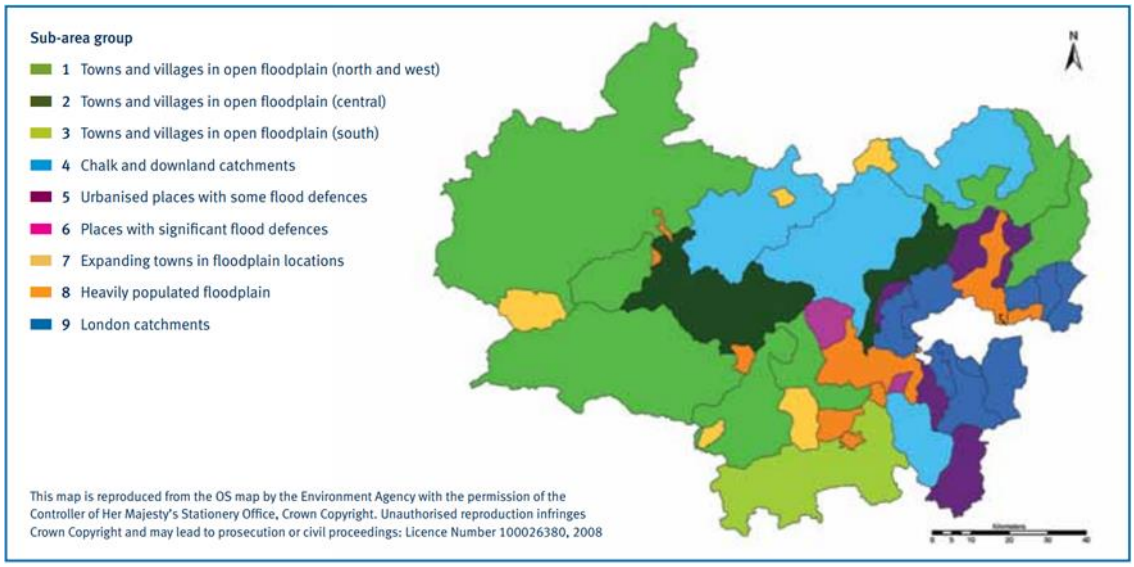


Figure 2-1. Thames CFMP Sub-Area Grouping (Thames CFMP Map)

The Thames CFMP identifies that Haringey, within the Lower Lee sub-area, will find it difficult to implement major flood defences. These areas will have major technical obstacles that mean any solutions will be expensive and will not provide the entire community with the levels of flood protection that they require. It states that flood plain management will be key in these areas, including adapting buildings with flood resilient and resistant measures.

2.3.4 Thames River Basin Flood Risk Management Plan 2016

The Thames River Basin Flood Risk Management Plan (FRMP) was published in March 2016. The Thames River Basin FRMP is produced in line with the EU Floods Directive (2007), helping to meet the Directive's requirements for RMAs to produce FRMPs. In the UK, the Directive's requirements are legislated through the FRR. The documents are updated on a six-yearly basis. They set out how RMAs will work with communities to manage flood and coastal risk over the next six years within the Thames River Basin District. The current cycle runs from 2015 to 2021.

The objectives of the Thames River Basin FRMP are grouped into social, economic, and environmental themes. They outline the main areas where RMAs aim to make improvements. A set of Thames River Basin District-wide measures have been produced to work towards achieving specific objectives. These measures fall under one of four different categories:

- Preventing risk
- Protecting from risk
- Preparing for risk
- Recovery and review

Details on these objectives and measure categories can be viewed in Sections 4 and 8 of Part A of the Thames River Basin FRMP. A new Thames River Basin FRMP is currently in development and is expected to be published in spring 2022. Haringey will be involved in this process through the review of existing, and the creation of new, FRMP objectives and measures.

2.3.5 London Sustainable Drainage Action Plan

The London Sustainable Drainage Action Plan (LSDAP) was published in 2016. The Plan aims to address the flood risk challenges posed by London's increasing population, changing land use, and climate change which places pressure on the city's drainage and sewer system.

Increased surface water runoff and greater foul water discharges have frequently left the existing drainage systems across London over-utilised. In response, the GLA have produced the LSDAP to help reduce the increasing flood risk. The focus of the Plan is retrofitting sustainable drainage to existing infrastructure, buildings, and land. It looks at opportunities where retrofitting schemes can be implemented at lower costs and provides money saving measures to local users.

The LSDAP aims to set the direction for the next 20 years. It provides short-term objectives, setting out 40 actions specifically for 2016 to 2021. These actions require the GLA to work in partnership with RMAs including the EA, Thames Water Utilities Ltd. (TWUL), Transport for London (TfL) and London Boroughs. The actions range from wider policy improvements and delivery of SuDS projects to the identification of opportunities to better implement SuDS in schools, housing and transport schemes.

2.3.6 North London Waste Plan

The North London Waste Plan (NLWP) is a joint waste plan that covers the North London boroughs of Haringey, Barnet, Camden, Enfield, Hackney, Islington and Waltham Forest. The NLWP identify suitable sites for the management of North London's waste up to the year 2031 as well as a suite of policies to assess planning applications for waste uses. The plan was reviewed by an independent Planning Inspector and is due to be adopted by the North London boroughs in the first half of 2022.

NLWP's Policy 5 requires that, "*development has no adverse impact on Flood Risk on or off site and to reduce risk where possible*." The NWLP also states that flood risk must be considered when choosing sites for waste facilities and a sequential approach to the layout of the site should aim to locate development in areas with the lowest risk. Facilities near or adjacent to flood risk will be expected to provide a reduction in flood risk through design and show that flood risk will not increase off-site due to the facility being developed. Finally, the document states that the EA must be consulted to review the site's impact on flood risk from an early stage.

2.4 Local

2.4.1 Haringey Local Plan

Haringey's current Local Plan comprises of four separate documents:

- Local Plan: Strategic Policies (adopted 2013, updated July 2017)
- Development Management DPD (adopted July 2017)
- Site Allocations DPD (adopted July 2017)
- Tottenham Area Action Plan (adopted July 2017)

2.4.2 Local Plan: Strategic Policies

Haringey's Local Plan: Strategic Policies sets out the vision and policies for the development of the borough until 2026.

As per the revised NPPF 2021, Local Plans should take into account the current and future impacts of climate change (see *Section 2.2.1* for further details on NPPF requirements). In recognition of this, Haringey includes Strategic Policy (SP) 4: Working Towards a Low Carbon Haringey. SP4 contains goals towards energy and carbon emission reduction from new development and the promotion of low- and zero-carbon energy generation through decentralised energy hubs.

SP5: Water Management and Flooding of the Local Plan aims to address the challenges posed by surface and fluvial waters in Haringey. The policy requires that all development shall:

- Improve the water environment, water quality and drainage systems;
- Minimise water use and illustrate how development would contribute to general and flash flooding;
- Take account of flood risk vulnerability classification as set out in paragraph 100 of the NPPF and will apply the NPPF Sequential Test and Exception Test;
- Implement measures to prevent (or mitigate as last resort) local surface water and downstream flooding;
- Implement Sustainable Drainage Systems from strategic to individual site level to improve water attenuation, quality and amenity;
- Restore and enhance the Blue Ribbon Network including Pymmes Brook, Moselle Brook, the River Lee and its tributaries, de-culverting wherever feasible, to improve water quality and amenity of these waterways and to help reduce flood risk (in line with London River Action Plan); and
- Require higher resilience and levels of flood protection for critical infrastructure to ensure the protection of essential services such as water and power.

The policy requires developments to be guided to areas with the lowest flood risk in line with current national guidance (the revised NPPF). The NPPF contains further information on the application of the Sequential Test and Exemption Test (*Section 6*).

2.4.3 Development Management DPD

The Development Management DPD provides a clear framework for supporting development objectives in Haringey's Local Plan Strategic Policies and contains criteria-based policies against which planning applications can be assessed. The document contains *Policy DM 24: Managing and Reducing*

Flood Risk that states the flood risk requirements for developments. These requirements are captured in *Table 6-1.*

The DPD contains additional policy regarding water management, that incorporate national standards into the Local Plan requirements. These include:

- Policy DM 25: Sustainable Drainage Systems (SuDS)
- Policy DM 26: Critical Drainage Areas
- Policy DM 27: Protecting and Improving Groundwater Quality and Quantity
- Policy DM 28: Protecting and Enhancing Watercourses and Flood Defences, and
- Policy DM 29: On-site Management of Waste Water and Water Supply

Each policy states the borough's objectives and requirements regarding flood risk, drainage and water management for developers. Further information about these policies can be found within the Development Management DPD. The policies were used within this SFRA to guide flood risk policies required in *Section 6*. Specific information on each policy can be found in *Table 6-1.*

2.4.4 Tottenham Area Action Plan

Tottenham was identified in Haringey's Local Plan as an area for growth within the borough. The Tottenham Area Action Plan (AAP), adopted in 2017, provides a detailed plan to implement long-term regeneration in Tottenham, including plans for new home development, better employment opportunities and improved transport links. It identifies land capable of delivering up to 10,000 new homes and 5,000 new jobs. The AAP covers areas including Tottenham Hale, Northumberland Park and Tottenham Green.

The Tottenham AAP provides specific sites in the area that would be suitable for development. It also provides information on the flood risk requirements for those sites, identifying which sites require a FRA.

2.4.5 Wood Green Area Action Plan

Wood Green was identified as an area for growth within the Haringey's Local Plan. The Wood Green AAP Consultation Draft was issued February 2017, however the AAP has not been adopted by Haringey. The aim of the Wood Green AAP is to provide guidance to developers, landowners, service providers and the wider community on how the area will develop in the future and how development proposals will be assessed. A net increase of 4,300 residential homes, 47,000m^2 of employment floorspace and 17,000m^2 of town centre floorspace is anticipated to be developed in the area in the coming years.

The Wood Green AAP Consultation Draft provides specific sites in the area that would be suitable for development. It also provides information on the flood risk requirements for those sites, identifying which sites require a FRA.

2.4.6 New Haringey Local Plan

A new Local Plan (referred to henceforth as New Local Plan) is currently being prepared which will replace the four existing Local Plan documents with a single consolidated Local Plan document. This is being prepared to ensure Haringey continues to have an up-to-date Local Plan which provides a robust basis for deciding planning applications that incorporates Haringey's overall aspirations for the borough. The main reasons for undertaking a New Local Plan now are to:

- Take account of Haringey's Borough Plan 2019-2023
- Respond to Haringey's declaration of a Climate Emergency
- Take account of changes to national planning policy and guidance
- Take account of the London Plan 2021
- Respond to housing delivery challenges
- Support recovery and renewal from Covid-19

In 2020 Haringey published a New Local Plan First Steps Engagement document for consultation. A draft Local Plan is set for publication in 2022 and will be informed by this Level 1 SFRA.

2.4.7 Upper Lee Valley Opportunity Area Planning Framework

The Upper Lee Valley Opportunity Area Planning Framework (OAPF) was developed by the Greater London Authority (GLA) and the boroughs of Enfield, Haringey, Waltham Forest and Hackney in 2013. The Upper Lee Valley Opportunity Area is one of the largest Opportunity Areas in London. The objectives of the OAPF include:

- Growth at Tottenham Hale, Blackhorse Lane, Meridian Water in Central Leeside and Ponders End.
- Optimised development and redevelopment opportunities along the A10/A1010 Corridor, in particular the Tottenham High Road Corridor and Northumberland Park.
- Over 15,000 new jobs by 2031 across a range of industries and a green industrial hub creating greater learning and employment opportunities.
- Over 20,100 new well designed homes by 2031.
- Full integration between the existing communities and the new jobs, homes and services provided as part of the new developments.
- A Lee Valley Heat Network linked to the Edmonton Eco Park.
- Significant investment and improvements to transport infrastructure, including four trains per hour on the West Anglia Main Line and improvements to help people walk and cycle more easily through the area.
- A fully accessible network of green and blue spaces which open up the Lee Valley Regional Park. The networks between them will be improved benefitting both people and wildlife.

Appendix TA5 Flood risk management within the document highlights the different flood risk sources in Tottenham Hale and other high risk Flood Zones.

2.4.8 Local Flood Risk Management Strategy

Haringey's Local Flood Risk Management Strategy (LFRMS) was published in August 2019 as a 'living document,' to be updated over time as Haringey understood more about flood risk in the borough. The LFRMS was produced in line with the requirements of the FWMA and National FCERM Strategy. The overarching objective of the document is to better understand, communicate and manage flood risk in Haringey through partnership working. It aims to do this through coordinated approaches for the benefit of all receptors, including property, people, and the environment. The LFRMS sets out Haringey's approach to limiting the impacts of localised flood risk across the borough. It is a high-level document which sets out eleven objectives with a set of associated measures for flood risk management. These objectives are:

- Identify, define and prioritise Critical Drainage Areas, including further definition of existing local flood risk zones, and mapping new areas of potential flood risk

- To improve the understanding of flood risk within Haringey and ensure everyone understands their roles and responsibilities in reducing the risks.
- To confirm all the elements such as tanks, ponds etc. that have a role in surface water management and make the information available to the public and drainage professionals.
- To ensure the long-term integrity of privately owned structures that have a role in flood protection.
- To enable Statutory Organisations and the public to work together to reduce flood risks by using all available resources and funds to achieve the greatest benefit.
- To avoid an increase in flood risk as a result of development by preventing additional rainwater entering existing drainage systems wherever possible.
- To take a sustainable and holistic approach to flood management, seeking to deliver wider economic, environmental and social benefits, climate change mitigation and improvements under the Water Framework Directive.
- To encourage the maintenance of privately owned flood defences and ordinary watercourses and minimise any impediment to flow.
- To develop a process to ensure that critical sections of watercourse are kept clean and maintained on a regular basis to avoid flooding.
- To share information on flood management best practice.
- To ensure that proposals and policies are properly integrated with any other flooding related plans.

Upon the further update of the 2020 National FCERM Strategy (see *Section 2.2.5*), Haringey will update their LFRMS to align with the themes and objectives of the National FCERM Strategy.

2.4.9 Preliminary Flood Risk Assessment

The Preliminary Flood Risk Assessment (PFRA) was published in May 2011. It was produced in line with the EU Floods Directive 2007 and FRR requirements, which aims to make flood risk management more consistent across Europe (see *Section 2.2.4* for further information). All original PFRAs for London boroughs were written as part of the Drain London project to ensure consistency. It was updated in 2017 as part of an EA-led exercise to define the Greater London Flood Risk Area.

The PFRA is an evaluation of flood risk in Haringey, designed to help inform the strategic management of flood risk in the borough. The Assessment analyses previous significant flood incidents and identifies key flood risk areas. It also analyses future flood risk through undertaking a high-level assessment of the available flood risk data. This includes information from the EA, TWUL, the London Fire Brigade (LFB), Network Rail, TfL (including London Underground), Natural England, British Waterways, Highways Agency and neighbouring London Boroughs.

2.4.10 Surface Water Management Plan

The Surface Water Management Plan (SWMP) was published in September 2011. The document helps LLFAs meet certain requirements outlined in the FRR, as it can provide the evidence base to inform PFRAs and help fulfil the requirement for FRMPs. Haringey's SWMP was created as part of the Drain London project to outline the preferred management strategy for surface water runoff for each borough.

The SWMP (2011) describes predicted and historic flooding from various sources which may impact upon surface water flood risk, including sewers, drains, groundwater plus runoff from land, small

watercourses and ditches. It is broken down into a four-phase approach: Phase 1 – Preparation; Phase 2 – Risk Assessment; Phase 3 – Options; and Phase 4 – Implementation and Review.

As part of the Risk Assessment phase, the SWMP (2011) defined Critical Drainage Areas (CDAs) for Haringey. CDAs are geographical areas (usually hydrological catchments) where multiple and cumulative sources of flood risk have the potential of causing flooding in one or more Local Flood Risk Zones. The impact of this potential flooding could affect people, property, and local infrastructure. The SWMP identified nine CDAs in the borough:

- CDA 010: Green Lanes and neighbouring roads, Wood Green
- CDA 055: Area North of Hornsey High Street, Hornsey
- CDA 056: Rathcoole Gardens / Weston Park, Hornsey Vale
- CDA 057: South Tottenham
- CDA 061: Tottenham High Road and Suburbs
- CDA 062: Milton Park and Causton Road, Crouch End
- CDA 063: The Roundway (A10) and Warkworth Road, Tottenham
- CDA 073: Alexandra Palace Railway Station and mainline railway, Wood Green
- CDA 075: Ellenborough Road, Noel Park

As part of the Options phase, the SWMP recommends potential mitigation options that could be incorporated into future CDA flood alleviation schemes. Full details regarding these options can be viewed in Section 4 of the SWMP (2011).

2.4.11 North London Level 1 Strategic Flood Risk Assessment (SFRA), 2008

Haringey's most recent previous Level 1 SFRA was published in 2008. The assessment was jointly commissioned with six other North London Boroughs - Barnet, Camden, Enfield, Hackney, Islington and Waltham Forest. The North London SFRA concluded that Haringey was at risk from fluvial, sewer and surface water flooding but not groundwater or tidal flooding.

2.4.12 Haringey Level 2 Strategic Flood Risk Assessment (SFRA), 2015

A Level 2 SFRA was prepared in August 2013. This report was subsequently revised in 2015 to include additional development sites and updated flood risk information. The 2015 assessment is Haringey's most recent Level 2 SFRA. The mapping in this Level 1 SFRA will supersede that within the 2015 SFRA and replace this as the most up-to-date mapping of flood risk in Haringey. It is expected that a new Level 2 SFRA will be created in the near future by Haringey.

2.4.13 Neighbouring Borough Policy Documents

Haringey is surrounded by the London Boroughs of Enfield, Barnet, Waltham Forest, Islington, Camden and Hackney. Due to the cross-boundary nature of flood risk, the Borough's flood risk policy may have an impact on Haringey. Therefore, the Boroughs' SFRAs and Local Plans were reviewed for relevant policy that may impact Haringey. It is summarised in *Table 2-1*.

Table 2-1. Neighbouring Policy and their relation to Haringey

Borough	Strategic Policy
Barnet	Barnet is included in the West London SFRA that was issued in 2018. It does not mention Haringey in any policies. Barnet has produced a Draft Local Plan (2021). The Draft Local Plan does not mention Haringey in regard to their policies on flood risk. The Barnet policies on flood risk include the NPPF requirements.
Camden	Camden issued an SFRA in 2014, it does not mention Haringey in any policies. Camden adopted their Local Plan in 2017. The Local Plan does not mention Haringey in regard to their policies on flood risk. The policies on flood risk include the NPPF requirements.
Enfield	Enfield issued an SFRA in 2021. The SFRA does not mention Haringey in any policies. Enfield has produced a Draft Local Plan (2021). The Draft Local Plan contains policies regarding flood risk, including options to refuse development that will increase flood risk elsewhere. This is significant to Haringey as Enfield's watercourses discharge upstream of Haringey into the River Lee, therefore the policy reduces the potential for additional flood risk from occurring in the borough.
Islington	Islington issued an SFRA in 2018, does not mention Haringey in any policies. Islington has produced a Draft Local Plan (2019). The Draft Local Plan does not mention Haringey in regard to their policies on flood risk. The policies on flood risk include the NPPF requirements.
Hackney	Hackney's most recent SFRA was the North London SFRA that was issued in 2008, of which Haringey was a partner (See *Section 2.4.11*). Hackney adopted their Local Plan in 2020. The Draft Local Plan does not mention Haringey in regard to their policies on flood risk. The policies on flood risk include the NPPF requirements.
Waltham Forest	Waltham Forest's most recent SFRA was the North London SFRA that was issued in 2008, of which Haringey was a partner (See *Section 2.4.11*). Waltham Forest has produced a Draft Local Plan (2019). The Draft Local Plan does not mention Haringey in regard to their policies on flood risk. Waltham Forest has stated that development proposals would not normally be granted planning permission on or near the Walthamstow Reservoirs, which lie on the eastern border of Haringey.

2.4.14 Climate Change Action Plan

In March 2019, Haringey declared a Climate Emergency and their desire to decarbonise the borough through an ambitious action plan, endorsing Parliament's declaration of a national climate change emergency. To help meet this goal, in November 2019, Haringey commissioned a piece of work

assessing how carbon emissions from the Borough could be rapidly reduced. The subsequent document produced was entitled Climate Action Haringey – Towards a Zero Carbon Future.

Following on from this, in March 2021, Haringey unanimously passed the adoption of the Haringey Climate Change Action Plan (CCAP). The document sets out the actions that Haringey intends to take to reach net carbon zero by the year 2041. The CCAP outlines actions that Haringey will take to reduce carbon emissions within Haringey and Council-owned assets, in residential and non-residential buildings and infrastructure, transport and the move to connecting to renewable energy.

3 DATA SOURCES AND MAPPING

The SFRA maps are delivered in a web map format, providing information on the different sources of flooding which impact the borough. The web map format enables all sources of flood risk to be evaluated. The SFRA provides the following five web maps:

- Fluvial & Tidal Flood Risk
- Surface Water Flood Risk
- Groundwater, Sewer and Artificial Flood Risk
- Policy
- GLA SuDS Opportunities

Appendix A provides information on the data used for the web maps, including details about data origin and key limitations.

4 Applying Climate Change to Risk Assessments

4.1 Overview

The EA published the Adapting to a Changing Climate report in May 2016. The document serves as the second adaptation report under the Climate Change Act 2008. It highlights the severe changing weather, with warmer temperatures, heavier rainfall and higher risk of drought. The report references the UK Climate Projections 2009 (UKCP09) which demonstrated the potential future impacts that a changing climate poses. UKCP18 was then released, providing a new set of climate projections for the UK. The projections from UKCP18 are broadly consistent with the UKCP09 projections, however, there are some seasonal and location differences for rainfall and temperature. These projections indicate that severe flooding may happen more often.

In response to growing evidence and climate change projections, Parliament declared a national climate change emergency on 1 May 2019. Prior to this, Haringey had declared a climate emergency in March 2019. Haringey has since produced a CCAP to achieve net zero within the borough by 2041. See *Section 2.4.14* for more information.

The NPPF sets out a number of considerations with regards to planning for climate change. It states that:

"Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures."

Policies should also support measures to increase community and infrastructure resilience against climate change. It is vital that all risk assessments appropriately assess the impacts of climate change.

4.2 Climate Change Guidance

4.2.1 Updates

The EA published their Flood Risk Assessments: Climate Change Allowances guidance in 2016. This guidance provides information on how climate change allowances should be applied for SFRAs and site-specific FRAs. In July 2021, the EA published their revised Climate Change Allowances to incorporate UKCP18 data. UKCP18 projections were used to update peak river flow allowances. The EA has also updated the guidance on how to apply peak river flow allowances, basing allowances on management catchments.

The EA is currently updating their river models based on the recently revised climate change allowances. The outputs from the river model updates are expected to be available later in 2022. Following the publication of the river model updates, Haringey has committed to reviewing this SFRA with the revised flood risk information.

- UKCP18 builds on the success of the UKCP09, providing an upgrade to the range of climate projection tools available for use. Updates include:
- Up-to-date assessments of how the climate of the UK may change over the 21st Century
- High-resolution spatially coherent future climate projections for the globe at 60km scale and for the UK at 12km scale
- Downscaling the 12km climate model to a 2.2km scale
- Marine projections of sea-level rise and storm surge

Prospective developers and applicants should check the UKCP guidance to ensure the latest information is used as part of any FRAs. The UK Climate Projections: Headline Findings were published in September 2019 and provide details on the key conclusions from UKCP18.

4.2.2 Applying the updated climate change guidance

To correctly apply the latest climate change guidance, it is vital that applicants know the following information:

- The likely lifetime of the proposed development – This is typically 100 years for residential developments and 60 years for commercial developments. However, applicants should highlight this in the submitted FRA, where they are expected to justify why they have adopted a given lifetime for the proposed development.
- The vulnerability classification of the proposed development – See *Table 2* of the 'Flood Risk and Coastal Change' PPG.
- The epoch period for peak rainfall intensity – See *Table 1* of the 'Flood risk assessments: climate change allowances'. FRAs should assess the 'central' and 'upper end' allowances to understand the range of impact.
- The River Basin and Management Catchment that the proposed development is located in – Haringey is within the Thames River Basin and London Management Catchment. All FRAs that require peak river flow allowances should use the climate change allowances that align with their Management Catchment as seen in the Management Catchment table or map. Allowances are split into 'high++' (H++), 'upper end', 'higher central' and 'central'. The issued guidance provides information on how to decide which allowance should be used for FRAs. Applicants must consider the flood risk vulnerability classification of their proposed development and the flood zone it falls within.
- The capacity within the development to include required and additional resilience measures to further protect the proposed development against impacts of climate change.

4.3 Adapting to Climate Change

The PPG contains a section on Climate Change. It highlights that addressing climate change is one of the core land use planning principles which the NPPF expects to underpin plan-making and decision-taking. It provides guidance on determining and implementing suitable measures in the planning process to address the potential risks of climate change. To adapt to climate change, the PPG requires:

- Considering future climate risks when allocating development sites to ensure risks are understood over the development's lifetime.
- Considering the impact of and promoting design responses to flood risk and coastal change for the lifetime of the development.
- Considering availability of water and water infrastructure for the lifetime of the development and design responses to promote water efficiency and protect water quality.
- Promoting adaptation approaches in design policies for developments and the public realm.

5 FLOOD RISK IN HARINGEY

5.1 Responsibilities

As part of their FWMA responsibilities (see *Section 2.2.3*), RMAs must contribute towards the achievement of sustainable development, and collaborate on matters relating to flood risk management. All RMAs have a duty to co-operate, share information and act in a way that is consistent with National FCERM Strategy. This may be achieved through preparing relevant flood risk documents, assisting with development planning, or providing consent for flood risk related activities. *Table 5-1* provides a list of RMAs and their responsibilities for flood risk management.

Table 5-1. Risk Management Authorities and Responsibilities

Risk Management Authority	Responsibility (within the context of this SFRA)
Department for Environment, Food & Rural Affairs (DEFRA)	Overall national responsibility for policy on FCERM in England. DEFRA also provides funding for flood risk management.
Environment Agency (EA)	Supervises and works with others to manage flood risk and coastal erosion. They manage flood risk from main rivers, the sea and reservoirs. They have a range of responsibilities: • Providing flood risk advice to LPAs regarding development proposals in Flood Zones 2 and 3. • Managing fluvial and coastal flood risk by carrying out works. • Issuing and operating flood warning systems. • Facilitating works on or near main rivers, and works affecting watercourses, flood and sea defences and other structures protected by its byelaw by issuing consent. • Providing advice on development proposals (see *Section 6* for further details).
Lead Local Flood Authorities (LLFAs)	All boroughs within London are Unitary Authorities and deliver the LLFA role for their respective administrative areas. LLFAs have the lead operational role in managing flood risk from surface water, ordinary watercourses and groundwater sources. Their responsibilities include: • Developing, applying, maintaining and monitoring strategies for local flood risk management, including being involved in the preparation of SFRAs. • Preparing and maintaining a Preliminary Flood Risk Assessment, flood hazard maps, flood risk maps and flood risk management plans. • Designating structures and features that may have an effect on local flood or coastal erosion risk. • Investigating and reporting flood incidents (that reach a certain threshold). • Creating policies and guidelines to ensure that flood risk management work is effective. • Providing advice on major development proposals with surface water drainage implications (see *Section 6* for further details). • Regulation and enforcement of works on ordinary watercourses.
Highway Authorities	Within London this includes Highways England, all London Boroughs and TfL who are responsible for providing and managing highway drainage. There is no Highways England network within Haringey. When necessary, they must work with the EA and LLFAs when: • Working on highway drainage. • Working in roadside ditches. • Carrying out works on part of a watercourse. • Managing highway flooding.
Water and Sewerage Companies	Primary responsibility for floods from water & sewerage systems (sewer flooding, burst pipes or water mains, floods caused by system failures). Thames Water Utilities Ltd (TWUL) is the relevant water and sewerage company in the borough and have powers under the Water Industry Act 1991 regarding connection of proposed developments to their networks.

5.2 Local Flooding Characteristics

Haringey is an inner London borough which covers an area of 29.6 km^2. The borough is heavily urbanised with a diverse and increasing population. It shares its borders with the London Boroughs of Barnet to the west, Camden, Islington, Hackney to the south, Waltham Forest to the east and Enfield to the north. Although the borough is characterised by dense development, there are green and open spaces throughout the borough which make up approximately 25% of its total area. This includes large parks and woods such as Alexandra Park, Finsbury Park, Highgate Woods, Queen's Wood and smaller landscaped areas which are of significant amenity value to residents. The borough also includes part of the Lee Valley Regional Park, which is designated as Green Belt. In general, green spaces are more concentrated in the centre and western sections of the borough and the east is relatively deficient in green areas. This decreases its capacity for water attenuation and makes it more vulnerable to flooding.

5.2.1 Topography

The topography of Haringey generally slopes in an easterly direction towards the River Lee. The highest parts of the borough are in the western section along the boundary with Barnet, Camden, and Islington. The lowest part of the borough is towards the River Lee along the boundary of Waltham. The general topography can be seen using the LiDAR data layer in the accompanying *Web Maps*. There are a number of railway embankments throughout the borough which alter the natural topography and thus affect surface water flow paths.

5.2.2 Geology

According to the BGS geological mapping, Haringey is extensively underlain by London Clay Formation with a small area in the south-west underlain by the Claygate Member and Bagshot Formation bedrock geology. London Clay comprises of clay, silt and sand and has a very low hydraulic conductivity resulting in low infiltration rates. The Claygate member consists of clay, silt and sand and the Bagshot Formation is made up of sand. Areas underlain by these formations are more permeable and are generally associated with higher rates of infiltration.

The superficial geology for Haringey consists of a range of different deposits. On the eastern side of the borough along the banks of the River Lee channel, superficial deposits are mainly a mixture of Alluvium (clay, silt, sand and peat) and Enfield Silt Member (clay and silt) which are considered to have poor infiltration and high run-off rates. In the north of the borough, there are also small deposits of Taplow Gravel Member around Bruce Castle Park and Boyn Hill Gravel Member near Woodside Park and ST. Thomas Moore Catholic School. These are made up of sand and gravel and are more permeable than the river deposits. In the western side of the borough around Muswell Hill, there are Lowestoft Formation (Diamicton) and Dollis Hill Gravel Member (Sand and Gravel) superficial deposits. These are areas that are more permeable with higher rates of infiltration and produce less runoff.

5.2.3 Hydrology

All of Haringey's accessible rivers are located in the east of the borough but there is also a large network of underground waterways which flow throughout the borough (see *Figure 5-1*). There are four designated Main Rivers within Haringey, which the EA have responsibility and powers over. They are as follows:

- River Lee

- Moselle Brook
- Pymmes Brook
- Stonebridge Brook

The River Lee forms the eastern boundary of Haringey with Waltham Forest, flowing in a southerly direction. The River Lee drains a large rural catchment to the North of London, extending as far as Luton and encompassing parts of Hertfordshire and Essex. From Haringey, the River Lee then flows through the London Borough Hackney, Tower Hamlets and Newham, where it outfalls to the River Thames.

The Pymmes Brook flows through Enfield in an easterly direction, before entering Haringey near the Tottenham Marshes. The watercourse flows in a southerly direction before out falling into the River Lee Navigation near Tottenham Hale.

The Moselle Brook flows through Haringey in an easterly direction but is culverted for much of its flow path. The river was once a direct tributary of the River Lee, but now artificially flows into the Pymmes Brook before joining the River Lee. Only a small section of the river is above ground at Lordship Recreation Grounds and Tottenham Cemetery.

The Stonebridge Brook is a culverted Main River that flows through Haringey in an easterly direction and outfalls in the River Lee. It is located in the south-east of the borough, flowing through South Tottenham.

Haringey also has several ordinary watercourses, most of which are culverted. They are as follows:

- Hermitage Brook
- Heybourne Ditch
- Lesser Moselle
- Marsh Land Culvert
- Moselle Improvement
- Mutton Brook
- New River
- Old Moselle Brook
- Old Moselle Relief Culvert
- Old Moselle Relief Culvert North
- Stonebridge Improvement

The *Fluvial & Tidal Flood Risk Web Map* show the location of all these watercourses within the borough.

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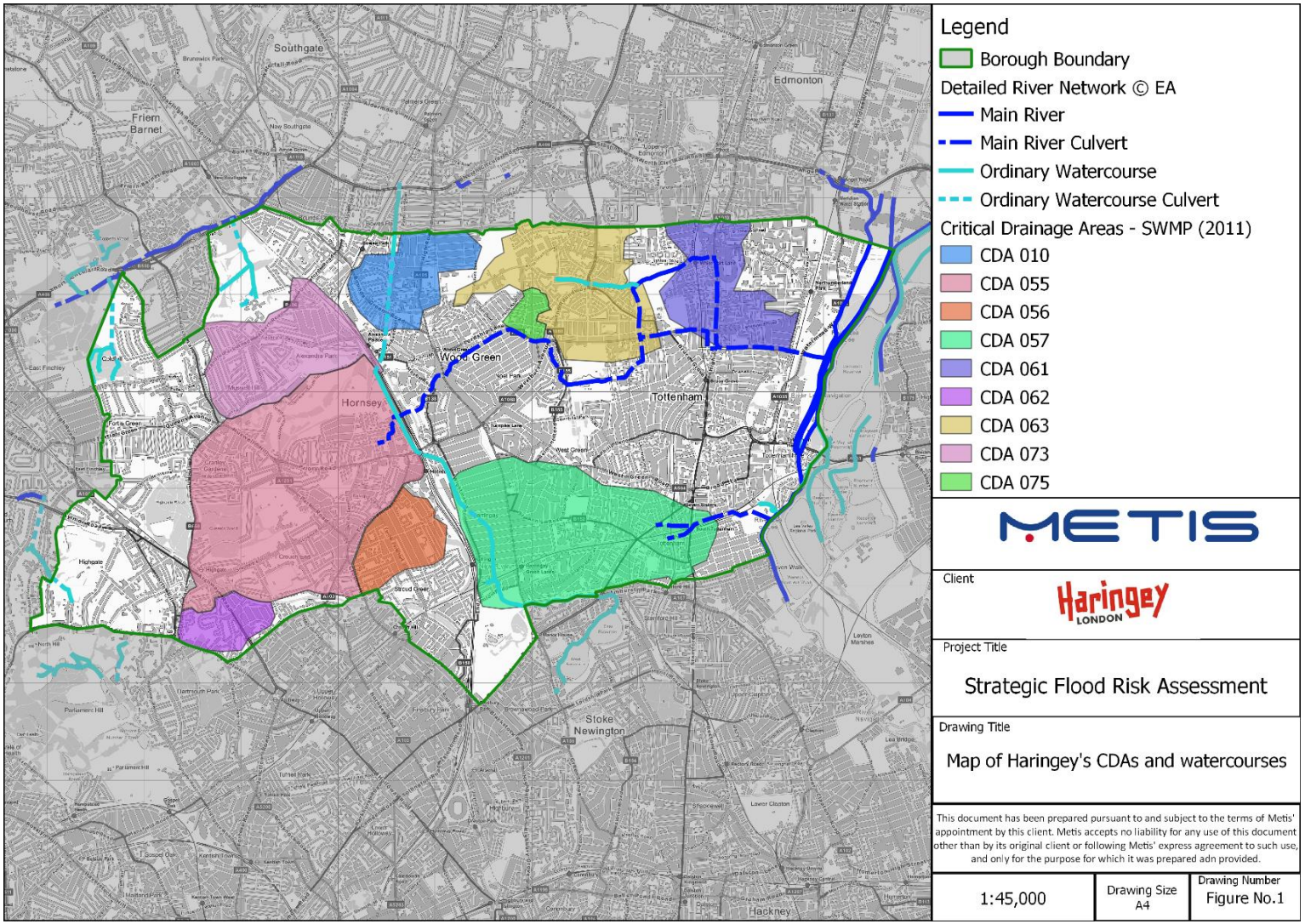


Figure 5-1. River network and critical drainage areas

5.3 Fluvial Flood Risk

5.3.1 Definition

Fluvial flooding, also known as main river flooding, occurs when heavy or prolonged periods of rain or snow melt causes a river to exceed its capacity. Floodplains and adjacent open spaces in the natural environment help manage and convey fluvial flooding, mitigating the potential widespread impact. The impact of fluvial flooding on urban environments can be severe, causing significant social, economic and environmental impacts.

5.3.2 Assessment

The risk of flooding from fluvial sources is shown in the *Fluvial & Tidal Flood Risk Web Map*. This breaks down the probability of fluvial flooding based on the EA's Flood Zone categories. These Flood Zones are defined as follows:

- **Flood Zone 1** – Land having a less than 1 in 1,000 annual probability of river or sea flooding.
- **Flood Zone 2** – Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding.
- **Flood Zone 3a High Probability** – Land having a 1 in 100 or greater annual probability or river flooding; or land having a 1 in 200 or greater annual probability or sea flooding.
- **Flood Zone 3b The Functional Floodplain** – This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the EA.

The EA's Flood Zones are based on the undefended flood scenario and do not account for the flood risk in an area that benefits from flood defence assets. *Section 5.12* of this document provides further information on the local Flood Zone 3 approach and the Haringey definition of each.

The EA Flood Zones are mostly located along this eastern border, near the River Lee. Based off the current River Lee models, only a small area of the borough located along the river edges is predicted to be at risk of flooding during a 1 in 100-year flood event. Flood Zone 3 is predominantly limited to the river channels, Tottenham Marshes and Markfield Recreation Ground. Flood Zone 2 is also extensive in the eastern section of the Borough. It covers much of Tottenham and Tottenham Hale.

There are small areas of the Moselle Brook designated as Flood Zone 2 and 3, mainly in areas where it is de-culverted such as Tottenham Cemetery and the Lordship Recreation Cemetery. There is a small extent of Flood Zone 2 along the culverted flow path at High Road in Tottenham. The Lordship Recreational Grounds has been the site of river restoration efforts to re-align the river channel and to introduce additional temporary storage areas for times of high flow. Therefore, the areas are shown within Flood Zone 3 and 2 as they are areas designed to be preferentially inundated in times of flooding.

There is currently no fluvial flood defence within the borough. However, the *Fluvial Flood Risk Web Map* highlights one area (Markfield Park) that is benefitting from the flood defences along the lower River Lee on the 'EA Flood Map for Planning (River and Sea) – Areas Benefitting from Flood Defences' layer.

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5.3.3 Impacts of climate change

Based on the EA's UK climate change projections for peak river flow and peak rainfall intensity, it is expected that climate change will place a greater number of people, properties, and infrastructure at risk of fluvial flooding. The frequency and severity of fluvial flooding would increase, increasing the need for flood defence and mitigation measures.

From current river models, the extent of fluvial flooding is predicted to increase by a small area in the 1 in 100 + 20% climate change scenario, mainly at Markfield Park in South Tottenham and at Tottenham marshes in the northeast of the borough. However, given the EA's updated climate change allowance this is likely an underestimation of the impact of climate change. The EA is currently updating their river models based on the recently revised climate change allowances. The outputs from the river model updates will be available later in 2022. Following the publication of the river model updates, this SFRA will be reviewed with the revised flood risk information.

5.4 Tidal Flood Risk

5.4.1 Definition

Tidal flooding occurs during extreme high tide and / or storm surge events. Water flows from the sea towards land, leading to the inundation of low-lying areas. This includes tidal river flooding, rivers whose level and flow are influenced by tides.

5.4.2 Assessment

Haringey is not at risk of tidal flooding.

5.5 Surface Water and Ordinary Watercourse Flood Risk

5.5.1 Definition

Surface water flooding occurs because of high intensity rainfall resulting in water ponding or flowing over ground before entering an underground drainage network or a watercourse. Ordinary watercourse flooding occurs under similar circumstances but is associated with non-main river watercourses or ditches. Surface water flooding is often exacerbated by the intensity or duration of the rainfall event, leaving soil, drainage channels and other drainage systems incapable of draining water at a sufficient rate. Extreme weather conditions can also lead to ordinary watercourses exceeding their capacity, overwhelming systems and causing water to flow onto land. Surface water flooding typically occurs for a similar timescale as the rainfall event that caused it, but ponding can persist in low-lying areas for longer. Due to its typically shorter duration, surface water tends to have less serious consequences compared to other forms of flooding but can still cause significant local damage and disruption in sudden, intense rainfall events.

For the purposes of this SFRA, the risk of flooding from ordinary watercourses is covered within the 'surface water' terminology. This aligns with the inclusion of ordinary watercourse flood risks within the EA's Risk of Flooding from Surface Water (RoFSW) mapping.

5.5.2 Assessment

The extent of surface water flooding varies throughout Haringey. The borough has several large areas of green space including Alexandra Park, Finsbury Park, Highgate Wood and Queen's Wood. These

areas help mitigate against the impact of surface water runoff due to vegetation and soil percolation reducing peak runoff. However, most of the borough is heavily urbanised and densely populated. In these areas, the ground cover is predominantly impermeable which reduces ground infiltration and in turn increases overland flows. These flow paths will flow towards topographical low points and result in a higher peak runoff rate. The places, people and buildings along these overland flow paths are at risk of surface water flooding.

The *Surface Water Flood Risk Web Map* highlights areas within the borough that are at risk of surface water flooding. This mapping shows the EA RoFSW flood extent and depth for the following rainfall scenarios; 1 in 30 year (3.3% AEP), 1 in 100 year (1% AEP) and 1 in 1000 year (0.1% AEP). The RoFSW map layers are national scale datasets that are optimised for viewing at a 1:10,000 scale. They are not appropriate for identifying surface water flood risk at a property level scale.

The EA dataset indicates that flooding is predicted to occur at a number of roads and residential areas throughout the borough. This is generally expected to follow natural valleys, ponding at low points in the topography or where water is constricted behind an obstruction or embankment. For example, the Seven Sisters Road and the surrounding housing estate (entrance at Culvert Road) and a large area between Hornsey and Crouch End, particularly on Priory Road and Park Road are predicted to be at high risk of surface water flooding. Both these areas have significant extent in the 1 in 30 year flood scenario. Overland flow paths are also predicted in the south of Tottenham along the original course of the Stonebridge Brook (before it was culvert). The flow path begins on Green Lanes and flows east roughly parallel to St Ann's Road resulting in ponding in the vicinity of Culvert Road.

As a part of the SWMP (2011), Haringey carried out detailed borough specific hydraulic modelling to determine the causes and consequences of surface water flooding within the borough. The result of the model provides an indication of key flow paths, velocities, and areas where water is likely to pond. CDAs identified in Haringey's SWMP are referenced in *Section 2.4.10* and can be seen in *Figure 5-1*. More information of this can be found in the SWMP.

Information on surface water flood risk requirements and guidance for FRAs can be found in *Section 6.4.2*. Haringey has also defined the surface water 1% (1 in 100 year) rainfall scenario as Flood Zone 3a within the borough. Further information can be found in *Section 5.12.3.*

5.5.3 Impacts of climate change

Based on the EA's UK climate change projections for peak rainfall intensity, it is expected that climate change will place a greater number of people, properties and infrastructure at risk of surface water flooding. The EA's Adapting to a Changing Climate report (2016) highlights that wetter winters and more intense rainfall will cause more surface water runoff, leading to more localised flooding.

There are no EA specific surface water models that include climate change scenarios. This SFRA uses the RoFSW 1 in 1,000 year return period event as the climate change scenario for the 1 in 100 year return period event. Both events are found in the *Surface Water Flood Risk Web Map*. The extent and depth of predicted surface water flooding is increased for the 1 in 1,000 year scenario, with a large proportion of the borough's roads predicted to flood. The increase in surface water runoff because of climate change will place sewers and the drainage network under greater pressure, increasing the likelihood of sewer-related flooding. See *Section 5.7* for information on sewer flooding.

5.6 Groundwater Flood Risk

5.6.1 Definition

Groundwater flooding occurs because of the underground water table rising, which can result in water emerging through the ground and causing flooding in extreme circumstances. Groundwater flooding often occurs after extensive periods of heavy rainfall, potentially occurring for weeks or months. During these periods, a greater volume of water infiltrates through the ground, causing an underlying aquifer to rise above its regular depth. Springs and low-lying areas, where the water table is likely to be closer to the surface, pose greater risk of groundwater flooding. Groundwater flooding can occur in areas where the underlying soil and bedrock are vulnerable to becoming saturated. Therefore, ground composition and aquifer vulnerability are significant influences on the potential rate of groundwater flooding.

5.6.2 Assessment

The EA 'Areas Susceptible to Groundwater Flooding' Map is shown in the *Groundwater, Sewer and Artificial Flood Risk Web.* This dataset provides a strategic scale overview of areas at risk of groundwater flooding within the borough. There is no groundwater vulnerability data available for the south-west region of Haringey as well as some areas in the middle of the borough. The areas with available data are mostly in the low risk (<25%) of groundwater flooding category. However, the eastern edge of the borough where the Clendish and Tottenham Marshes (connected to the Walthamstow Wetlands) are located, have a predicted groundwater flood susceptibility of between 25% to 75%. This is likely caused by superficial deposits flooding from the underlain River Terrace deposits. As a part of Haringey's SWMP an increase Potential for Elevated Groundwater map (iPEG) was produced which included an assessment of the potential of groundwater to rise in both consolidated aquifers and from superficial permeable deposits (unconsolidated aquifers).

5.6.3 Impacts of climate change

The impact of climate change on groundwater levels is highly uncertain. The EA's UK climate change projections for peak rainfall intensity predicts an increase in groundwater levels during rainfall events. The milder, wetter winters expected because of climate change could therefore result in an increased frequency and severity of groundwater-related flood events. However, the warmer drier summers may lower recharge of aquifers and counteract this effect. Currently, there are no borough-wide investigations available which analyse this effect.

5.7 Sewer Flood Risk

5.7.1 Definition

Sewer flooding can occur due to:

- Drainage system failure (such as blockage or collapse).
- An increased flow and volume of water entering a sewer system, resulting in the system exceeding its hydraulic capacity and surcharging.
- Sewer outfall points being either blocked or submerged due to high water levels, causing back up in the system and flooding.

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These issues can result in water overflowing from gullies and manholes, causing flooding in the local area.

5.7.2 Assessment

The sewer system in Haringey is owned and operated by TWUL. The borough is predominantly served by separate surface water and foul sewer systems, except for a small amount of combined sewer located at the southern and eastern part of the borough. Modern sewer systems are designed to be separate systems, typically accommodating up to 1 in 30 year rainfall events in surface water sewers. However, sewer system segments across the borough vary in capacity due to age. Older segments have a lower capacity and may not be designed to accommodate rainfall events as significant as 1 in 30 year events.

TWUL have responsibilities for all 'public sewers' (the drainage network which serves more than one property, including associated manholes) under the Water Industry Act 1991. Typically gullies or drains and the interconnecting pipework which drain into sewers are the responsibility of the private landowner or, for those draining the highway, the Highways Authority. Due to the interconnection between these different assets, any associated flooding may be caused by a combination of factors, therefore all relevant parties should be involved in subsequent investigations and, where necessary, work to resolve the root cause.

TWUL maintains a record of all sewer flooding events that have been reported in the borough. This dataset provides details on the number of sewer flood incidents within a four-digit postcode area (See *Table 5-3*) and gives an indication of which areas of the borough are most at risk of sewer flooding. According to this, the south-western section of the borough is expected to be more vulnerable to sewer flooding, with the most records occurring in Crouch End (N8 8), and surrounding postcodes such as N8 9, N6 5 and N10 3 which have all experienced between 5-10 sewer flooding events. In the western side of the borough, the highest number of sewer flooding incidents have been recorded in Tottenham (N15 4). Consideration needs to be given to the existing sewer network as part of all new development proposals. Policy DM9 in the Development Management Policy of the adopted Local plan and the New Local Plan requires that applicants for major developments provide evidence in the form of written confirmation as part of the planning application that capacity exists in the public sewerage and water supply network to serve their development. As new developments are added into the catchment area additional capacity stress is applied to sewers, increasing the chance of them becoming overloaded. Sewer flood risk is something that can therefore increase throughout the borough. The *Groundwater, Sewer and Artificial Flood Risk Web Map* contains information regarding recorded sewer flood incidents.

5.7.3 Impacts of climate change

The predicted impacts of climate change on sewer flood risk are closely linked to potential changing rainfall patterns and intensity, as well as changes in surface water flood risk. Based on the EA's UK climate change projections for peak rainfall intensity, the UK can expect an increase in rainfall intensity during rainfall events. This would increase the flow and volume of water attempting entry into the drainage system, increasing the chances of sewer overload. Sewer overload can result in surface water surcharging, resulting in localised flooding above ground. It can also result in an increase in untreated wastewater overflows entering the environment through combined sewer overflows into rivers, causing widespread damage.

5.8 Artificial Sources of Flood Risk

5.8.1 Definition

Artificial flooding can occur because of infrastructure failure or human intervention. Sources of artificial flooding include reservoirs, canals, ponds and other artificial structures. The probability of a structural breach is low; however, the potential extent of damage can be significant. Artificial source failure could leave many properties at risk of flooding.

5.8.2 Assessment

There are two canals located within Haringey, the River Lee Navigation channel (part of the Main River network) and the New River (owned and managed by TWUL). New River, an artificial and ordinary watercourse, flows southwards through the centre of the borough. It was constructed in 1613 to supply drinking water to London. It is currently used to transport water from the surrounding reservoir and treatment plants. Since the construction of the New River, its course and capacity has been altered in line with demand. The water level is regulated by sluice gates and the channel level has been raised above the surrounding ground level along some stretches. These sections are protected by flood defences, but failure of these defences could have significant consequences to properties and infrastructure in the vicinity.

There are a few small, covered reservoirs located within Haringey, however, the greatest risk of reservoir flooding comes from outside the borough boundary. A list of reservoirs that Haringey is considered to be at risk from is outlined in *Table 5-2*.

Table 5-2. List of relevant reservoirs

Reservoir Name	Utility Company	Local Authority
Banbury	TWUL	Waltham Forest
Bishop Wood Reservoir	TWUL	Haringey
Crouch Hill	TWUL	Haringey
East Warwick	TWUL	Waltham Forest
Fortis Green	TWUL	Haringey
High Maynard	TWUL	Waltham Forest
Hornsey	TWUL	Haringey
Lockwood	TWUL	Waltham Forest
King George V	TWUL	Enfield
Stoke Newington (East)	TWUL	Hackney
Stoke Newington (West)	London Borough of Hackney	Hackney
Walthamstow No.4	TWUL	Waltham Forest
Walthamstow No.5	TWUL	Waltham Forest
West Warwick	TWUL	Waltham Forest
William Girling	TWUL	Enfield

The sudden failure of any of these reservoirs, in particularly the large Walthamstow Wetlands which are located directly along the borough boundary, could potentially have catastrophic consequences for Haringey. Reservoir flooding can occur with little or no warning, making evacuation difficult to plan. Seeking refuge from floodwaters upstairs may not be possible as the buildings could be unsafe or unstable due to the force of water from the breach or failure. The maintenance and regular inspection

of the reservoirs is the responsibility of the reservoir owners, and the enforcement of the Reservoir Act (1975) is the responsibility of the EA. Through enforcement of regular inspections and maintenance, the risk of flooding due to reservoir failure is considered low.

The *Groundwater, Sewer and Artificial Flood Risk Web Map* shows the risk of flooding from reservoirs. It shows the largest area that could flood if a reservoir were to fail and release the water it holds. Information presented on the web map displays the worst-case scenario, providing data that could be used for emergency planning purposes.

5.8.3 Impacts of climate change

Due to the complex nature of reservoirs and other large artificial infrastructure, the potential impacts of climate change on these structures are complex and varied. Climate change could result in extreme fluctuations in water levels due to changes in frequency and intensity of rainfall. This could therefore have a knock-on effect on reservoir yields.

5.9 Residual Risk of Flooding

5.9.1 Fluvial Defence Breach / Failure

Overtopping or failure of the flood defence assets could occur. Defences can be overtopped due to wind and wave actions. In addition, structural failure of the flood defence assets can lead to these features being breached. As mentioned in *Section 5.3.2*, there are currently no flood defences within the borough and there is only one small area (Markfield Park) that is benefitting from the flood defences outside of the borough. Overall, the probability of residual risks linked to overtopping and flood defence asset failure is small. However, if the flood defences along the lower River Lee that are providing benefit to the Markfield Park fail, this could potentially cause damage and pose risk to life.

5.9.2 Flood warnings and alerts

The EA issues Flood Warnings and Alerts to specific areas when flooding is possible (flood alerts) or when flooding is expected (flood warning or severe flood warning). This enables the EA, residents and businesses to prepare as required to mitigate against the potential impacts of tidal and fluvial flooding. Severe flood warnings are issued where there is potential for risk to life.

The flood warning and flood alert areas within Haringey can be seen from the *Fluvial Flood Risk Web Map*. It covers a large number of residential areas and green spaces in the western part of the borough west of the River Lee and Pymmes Brook.

5.10 Historic Flooding

Haringey has historic flooding information for a number of different flood sources. The EA's 'Historic Flood Map' dataset shows the maximum extent of all individual recorded flood outlines in Haringey. TWUL also provides historic flooding information on flood incidents reported to them. The EA's 'Historic Flood Map' dataset can be viewed as part of the *Fluvial and Tidal Flood Risk Web Map*, whilst TWUL's historic flooding information can be viewed as part of the *Groundwater, Sewer and Artificial Flood Risk Web Map*.

The historical records of sewer flooding that is the best available to TWUL are provided on the three-digit postcode areas. It covers the period from 1989 to 2021 and was provided by TWUL on 2 July 2021. It highlights several areas within the borough to be at a high risk of sewer flooding as listed below.

Table 5-3. Number of Sewer Flooding Incidents Held by TWUL

Number of Flood Incidents Attended											
	Haringey Postcode District										
Year	N10	N11	N13	N15	N17	N2	N22	N4	N6	N8	**Total**
2017	14	4	0	35	84	2	43	10	5	32	229
2018	10	1	1	44	78	4	35	18	10	37	238
2019	14	5	2	31	72	1	37	17	10	25	214
2020	11	4	0	44	80	4	27	21	10	21	222
2021	8	0	0	33	47	0	19	9	11	39	166
Total	57	14	3	187	361	11	161	75	46	154	1069

LFB holds information in relation to special service incidents attended by the LFB. The total number of flooding incidents attended in the borough from 2017 to 2021 are provided on the four-digit postcode areas as shown below. The data was provided by LBF on 24 Aug 2021 and covers the flooding incidents attended and recorded as surface water flooding and burst water main flooding incidents.

Table 5-4. Number of Surface Water Flooding and Water Main Burst Incidents Held by LFB

Postcode	Total Number of Incidents	Locality	Postcode	Total Number of Incidents	Locality
N8 8	20	Crouch End	N15 5	5	Tottenham
N8 9	8	Crouch End	N15 6	3	Tottenham
N4 4	3	Crouch End	N17 0	2	Tottenham
N8 7	2	Crouch End	N17 6	2	Tottenham
N2 0	2	East Finchley	N17 7	1	Tottenham
N2 9	1	East Finchley	N17 8	1	Tottenham
N6 5	7	Highgate	N17 9	1	Tottenham
N6 4	5	Highgate	N22 8	8	Wood Green
N10 2	8	Muswell Hill	N22 5	5	Wood Green
N10 3	8	Muswell Hill	N4 1	5	Wood Green
N10 1	3	Muswell Hill	N8 0	3	Wood Green
N22 7	2	Muswell Hill	N22 6	1	Wood Green
N15 4	13	Tottenham			

Developers and prospective applicants are advised to review these as part of the planning application process. Developers and applicants are also advised to review the PFRA, LFRMS and SWMP for more information; if there are any queries regarding the records, they are advised to contact Haringey LLFA. For further FRA guidance, see *Section 6.1*.

Significant flooding has occurred in Haringey since the above information was provided by TWUL and LFB. On the 12th and 25th of July 2021, widespread flooding was experienced across the borough. Significant issues were concentrated in areas of Wood Green, Hornsey – Crouch End and South Tottenham. The Haringey LLFA has published a Section 19 Flood Investigation Report for each of these areas. They can be found on the Haringey website through the following links:

- Wood Green
- Hornsey - Crouch End
- South Tottenham

5.11 Cross Border Flood Risk

Flood risk is an issue not constrained by borough boundaries and therefore must be assessed over a larger, cross boundary scale. Assessing flood risk on a catchment wide scale is essential to recognises the interconnectedness of hydrological processes.

Haringey is located entirely within the Lee Valley Catchment, along with its neighbouring boroughs of Enfield, Hackney and Waltham Forest. Activities within this catchment area can have broad impacts throughout the region. For example, the upper reaches of the River Lee and its tributaries generally extend into Green Belt or Metropolitan Open Land. As London expands, there is increasing pressure for development within these areas which could have adverse impact on flood risk downstream in Haringey. The increase in impermeable land cover associated with development reduce the land's capacity of infiltration and thus increase the volume and velocity of water that reaches the watercourse. Likewise, development in Haringey can increase flood risk downstream in Waltham Forest and Hackney.

Another significant flood risk source which lies outside the borough boundary is from reservoirs located outside the borough, as outlined in *Section 5.8.2*.

5.12 Flood Zones 3a and 3b – Fluvial / Surface Water

The two components of Flood Zone 3 are Flood Zone 3a and Flood Zone 3b. The EA has defined fluvial Flood Zones 3a and 3b and these are presented in *Section 5.3.2*. The designations for fluvial Flood Zone 3b should be further defined by LPAs in conjunction with the EA as described in *Section 5.12.1*. In addition to this, Haringey has included a surface water designation for Flood Zone 3a. Further information on Flood Zone 3b (fluvial), Flood Zone 3a (fluvial) and Flood Zone 3a (surface water) is provided below. The Policy Web Map highlights the extents of Flood Zone 3a (fluvial), Flood Zone 3a (surface water) and Flood Zone 3b (fluvial) within the borough.

5.12.1 Functional Floodplain / Flood Zone 3b

The Flood Risk and Coastal Change PPG defines functional floodplain as "*land where water has to flow or be stored in times of flood*" (PPG Table 1 in Paragraph 065). The PPG states that the extent of the functional floodplain, also known as Flood Zone 3b, should be defined by LPAs within their SFRAs. This allows for the incorporation of local circumstances and must be agreed with the EA and the boroughs' LLFAs. This SFRA defines Flood Zone 3b (functional floodplain – fluvial) as the following:

"Land within EA modelled fluvial flood risk extents predicted for up to and including 1 in 20 year return period events, allowing for the impact of flood defences. It also includes land featured as part of the EA's Flood Storage Areas dataset."

The Flood Zone 3b (functional floodplain) definition is adopted to ensure that future development is steered away from the most 'at risk' flooding extents from fluvial sources.

The Flood Zone 3b definition within this SFRA does not include surface water flood risk. It should be noted that a policy recommendation is made in *Section 7* for Haringey to potentially impose additional requirements for developments within the 1 in 30 year RoFSW extent.

5.12.2 Flood Zone 3a (Fluvial)

The PPG defines Flood Zone 3a as land that has a 'High Probability' of fluvial or tidal flooding. There is a greater than 1 in 100 (> 1%) annual probability of river flooding, or a greater than 1 in 200 (> 0.5%)

annual probability of sea flooding. The extent of Flood Zone 3a (fluvial) within Haringey is shown in the *Policy Web Map.* In accordance with the PPG, this SFRA defines Flood Zone 3a (fluvial) as the following:

"Land within EA modelled fluvial flood risk extents predicted for up to and including 1 in 100 year return period events."

5.12.3 Flood Zone 3a (Surface Water)

This SFRA defines Flood Zone 3a (surface water) as the following:

"Land within EA modelled surface water flood risk extents predicted for up to and including 1 in 100 year return period events."

The extent of Flood Zone 3a (surface water) within Haringey can be seen from the *Policy Web Map.* The Flood Zone 3a (surface water) extent uses the RoFSW map published by the EA. This is the most consistent and representative surface water dataset currently available.

Flood Zone 3a has been split into '(fluvial)' and '(surface water)' within the *Policy Web Map*, and the definitions of Flood Zone 3a (fluvial) (*Section 5.12.2*) and Flood Zone 3a (surface water) (*Section 5.12.3*) explain which datasets have been used for each. The mapping extents have been split to aid applicants and the LPA through highlighting the flood risk source(s) which a site may fall within.

The policy requirements are identical regardless of the flood source. Flood Zone 3a (fluvial) and Flood Zone 3a (surface water) may exceed the EA's Flood Map for Planning's Flood Zone 3 in some locations. This is due to differences in the modelling methodologies used to define fluvial and surface water flood risk mapped extents. It is for this reason that Flood Zone 3 does not equal Flood Zones 3a plus 3b.

Where Flood Zone 3a (surface water) exceeds the EA's Flood Maps for Planning's Flood Zone 3, Flood Zone 3a (surface water) as defined by this document takes precedence and should be applied accordingly. It should also be noted that, Flood Zone 3a always includes land also defined as Flood Zone 3b. This is no different from how Flood Zone 2 incorporates land within Flood Zone 3. Sites within Flood Zone 3a and / or 3b as defined by this SFRA will be treated as if it were in Flood Zone 3 with regards to the needs of the NPPF, PPG and site-specific FRA submission requirements. Where a location is mapped to be within two or more Flood Zones, the requirements for the highest risk zone must be applied.

In line with nationally defined responsibilities for management of flood risk, applications will be assessed by the relevant organisations, as follows:

- Flood Zone 3a / 3b (fluvial): EA and for minor developments Haringey LPA applying relevant Standing Advice
- Flood Zone 3a (surface water): Haringey LPA (in line with statutory duties)

Relevant Case Studies for Flood Zone 3a (Surface Water)

The West London SFRA has adopted the policy within the SFRA for the participating Boroughs. The London Borough of Richmond SFRA includes the policy as a recommendation.

6 FLOOD RISK ASSESSMENT GUIDANCE

6.1 Overview

Developers, applicants and LPAs need to consider flood risk to and from proposed development as part of any planning proposal. To assess the flood risk to and from a development, a site-specific FRA and/or Drainage Strategy should be carried out by the applicant. The site-specific FRA and/or Drainage Strategy should demonstrate that the proposed development will manage different sources of flood risk for the entirety of the development's lifetime (generally 100 years for residential development and 60 years for commercial). Applicants should justify the timescale for the lifetime of the proposed development.

It must be demonstrated that the development will not be at risk of flooding or increase flood risk elsewhere. The site-specific information supplied for any development application should be proportionate to the identified flood risks and appropriate to the scale, nature and location of the development. Developments must also be appropriately resilient to the potential impacts of climate change. Complying with the NPPF and policies from the London Plan (Policy SI 13) and Haringey's adopted Local Plan Strategic Policies (Strategic Policy 5), adopted Development Management DPD, and New Local Plan applicants must prioritise SuDS when proposing measures to reduce local flood risk. Measures that manage runoff as close to source as possible and contribute to the four main pillars of SuDS (amenity, biodiversity, water quality and water quantity) should be proposed where possible. These key principles need to be applied at the strategic level for borough-wide planning and at the site level for development proposals and site allocations. Applicant and LPA Development Management (*Section 6.4*) and Planning Policy (*Section 6.5*) specific guidance regarding FRAs is available in this section.

6.2 Sequential and Exception Tests

The NPPF requires that a sequential, risk-based approach to the location of development is taken to avoid, where possible, the risk of flooding to people and property. The approach needs to take current and future impacts of climate change into account. To demonstrate that efforts have been made to steer development to areas with the lowest risk of flooding, applicants may be required to carry out the Sequential and Exception Tests as part of their site-specific FRA.

The Sequential Test requires that proposed development sites are located within areas of lowest flood risk. Only if it can be demonstrated that there are no suitable sites within the wider search area then alternative sites (i.e. within areas that may potentially be at risk of flooding) can be considered. For this SFRA, the wider search area is defined as the entire borough extent, though there are locally defined search area exceptions depending on the location of the proposed development. Further information on search area exceptions can be found in *Section 6.4.1.*

The NPPF recognises that it may not always be possible to locate development in areas with a lower risk of flooding. These developments may be proposed in established communities that require continued development to grow. For these types of proposals, the NPPF provides the Exception Test. The Exception Test is a method to demonstrate and help ensure that flood risk to people and property will be managed satisfactorily, while allowing necessary development to go ahead in situations where suitable sites at lower risk of flooding are not available. To pass the Exception Test, the following two conditions need to be passed in line with paragraph 160 of the NPPF:

- the development would provide wider sustainability benefits to the community that outweigh the flood risk; and
- 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.

For further applicant guidance on applying the Sequential and Exception Test, see *Table 6-1* and Planning Policy guidance on the Sequential and Exception Tests can be found in and *Section 6.5*.

6.3 Planning Application Requirements

Planning permission is required if the work being carried out meets the Section 55 of the Town and Country Planning Act 1990 definition of a 'development'. Section 57 of the Town and Country Planning Act 1990 states that all work falling under this statutory definition of 'development' requires planning permission unless it meets permitted development criteria. The following are planning application definitions for development types:

- **Major Developments**: For residential developments, 10+ dwellings or site area over 0.5 hectares. For non-residential developments, total building floorspace exceeds 1,000m^2 or site area over 1 hectare.
- **Minor Developments**: For residential developments, 1-9 dwellings, site area under 0.5 hectares. For non-residential developments, total building floorspace is less than 1,000m^2, site area under 1 hectare.
- **Change of Use**: Developments classified as a 'Change of Use' if - (i) the application does not concern a major development; and (ii(a)) no building or engineering work is involved; or (ii(b)) the building or engineering work would be permitted development were it not for the fact that the development involved a change of use (such as the removal of internal dividing walls in a dwelling house to provide more spacious accommodation for office use).

General planning application guidance around floor risk is available via the PPG Site-specific FRA Checklist and the EA's Standing Advice. *Table 6-1* provides the local requirements that must be addressed as part of the flood risk and drainage strategy submission documents. The guidance is applicable for Major, Minor, and Change of Use and Changes Under Prior Approval Notifications developments, with development type-specific guidance highlighted where applicable. *Table* **6-1** also provides the requirements for the assessment and management of flood risk from other sources where applicable.

The information presented in *Table 6-1* are a mixture of legislative and best-practice requirements from various sources, including the NPPF, PPG, London Plan, and Haringey's adopted Local Plan. In some instances, the SFRA guidance and recommendations go beyond existing adopted policies at the time of writing. This includes policy guidance on where a Drainage Strategy is required, and where specific information is needed to address flood emergency and basement requirement, finished floor level requirements and flood plain compensation. This also includes the addition of the surface water 1 in 100 year extent (1% annual exceedance probability) being adopted into Flood Zone 3a (surface water) – refer to *Section 5.12.3*.

Table 6-1. Planning Application Requirements for **All Developments** (Flood Zones 1, 2, 3a and 3b)

Requirement Area	Flood Zone 3b (fluvial)	Flood Zone 3a (fluvial and surface water)	Flood Zone 2	Flood Zone 1
Land Uses and Development Restrictions (Information is from the Flood Risk and Coastal Change PPG and adopted Development Management DPD and New Local Plan)	The Flood Risk Vulnerability and Flood Zone Compatibility table in the PPG highlights that only 'Essential Infrastructure' and 'Water Compatible' developments may be granted planning permission. As the functional floodplain, land in Flood Zone 3b will be protected by not permitting any form of development on undeveloped sites unless it is for 'Water Compatible' development or 'Essential Infrastructure'. Redevelopment of existing developed sites will only be supported if there is no intensification of the land use and a net flood risk reduction is proposed; any restoration of the functional floodplain will be supported (see 'Flood Compensation Storage' section of this table). Proposals for the **change of use or conversion** to a use with a higher vulnerability classification will not be permitted.	The Flood Risk Vulnerability and Flood Zone Compatibility table in the PPG highlights that land use is restricted to 'Water Compatible', 'Less Vulnerable' and 'More Vulnerable' development. 'Highly Vulnerable' developments will not be permitted as it is not a permitted development type in Flood Zone 3a. Self-contained residential basements and bedrooms at basement level will not be permitted (see 'Basements' section of this table).	No land use restrictions. Self-contained residential basements and bedrooms at basement level will not be permitted (see 'Basements' section of this table).	No land use restrictions
Sequential and Exception Tests (*Information is from the NPPF and adopted Development Management DPD – refer to Section 6.4.1 for specific guidance on the application of these at the site-specific scale and New Local Plan*)	The Sequential and Exception Tests do not need to be applied if a site: • Is a '**minor development** in relation to **flood risk**': ○ industrial/commercial/leisure etc extensions with a footprint less than 250 m^2. ○ development that does not increase the size of buildings (e.g. alterations to external appearance) ○ householder development within the curtilage of the existing dwelling (e.g. sheds, garages, games rooms), in addition to physical extensions to the existing dwelling itself. • Is a **change of use development** – excluding caravans, camping chalets, mobile homes and park home sites. The Sequential and Exception Tests need to be applied for all **major developments** and **minor developments** as set out below.			
	Developments categorised as 'Essential Infrastructure' can only be considered following applications of the Sequential and Exception Tests. Paragraph 15 of the PPG states: *"If an area is intended to flood, then this should be safeguarded from development and identified as functional floodplain, even though it might not flood very often. Development can only be permitted following application of the Sequential Test, and a successful application of the Exception Test."*	The Sequential Test is required for all developments except for development proposals categorised as 'Highly Vulnerable' – 'Highly Vulnerable' development is not permitted (see 'Land Uses and Development Restrictions' section of this table). Developments categorised as 'Essential Infrastructure' and 'More Vulnerable' can only be considered following application of the Exception Test.	The Sequential Test is required for all development types. Developments categorised as 'Highly Vulnerable' can only be considered following application of the Exception Test.	The Sequential Test only needs to be applied for development proposals in Flood Zone 1 if the SFRA and accompanying web map indicates there may be existing flood issues from other sources (refer to *Table 6-2*) or flood issues in the future. This information may also come from other sources.
Site-specific FRA *(Information is taken form the NPPF, adopted Development Management DPD Policy DM 26 and the New Local Plan)*	A site-specific FRA is required for all development proposals – sites in Flood Zone 3b must also demonstrate that: • Infrastructure will remain safe and operational for users during flood periods. • The development will not impede flowing water. • There will be no net loss of floodplain storage (see the 'Flood Compensation Storage' section of this table). • Flood mitigation measures will reduce the overall flood risk of the site.	A site-specific FRA is required for all development proposals. Site-specific FRAs in Flood Zone 3a must also demonstrate that there will be no net loss of floodplain storage (see the 'Flood Compensation Storage' section of this table).	A site-specific FRA is required for all development proposals. Assessment needs to demonstrate the reduction of flood risk at the site through various mitigation techniques.	A site-specific FRA is required for all development proposals where there is evidence of a risk from other sources of flooding, including surface water, groundwater and sewer flooding.
	Flood risk from all sources should be assessed, including the potential impacts of climate change over the development's lifetime. The EA's 2016 climate change allowances (including subsequent updates) must be used when assessing peak river flows, sea level rises and peak rainfall intensities.			
	If the site for a development proposal falls within the Flood Zone 3a (surface water) extent (based on the *Surface Water Flood Risk Web Map*), the applicant is required to submit an FRA as part of a planning application. This is a requirement for all **major developments**, **minor developments**, and **change of use developments** that have a bearing on a site's existing drainage regime.			
	Where a site-specific FRA is required, predicted flood depths should be analysed and appropriately mitigated. Mitigation may include (but not be limited to) flood resistance measures (where predicted flood depths are less than 0.3m) or flood resilience measures (where predicted flood depths are greater than 0.6m). Predicted flood depths between 0.3m and 0.6m should be analysed on a case-by-case basis to determine if resistance measures are sufficient. Design plans should show floor levels (relative to Ordnance Datum) and predicted flood depths.			
	Proposals for new development within **Local Flood Risk Zones** (as defined by the SWMP) must include a statement describing how flood risk issues have been addressed and may require a further site-specific FRA to assess flood risk, particularly from surface water flooding.			
Drainage Strategy	A Drainage Strategy is required for all **major developments**. **Minor developments** and **change of use developments** that have a bearing on a site's existing drainage regime also need to provide a Drainage Strategy as part of the proposal.			
	The Drainage Strategy requires information on the proposed SuDS and surface water runoff discharge destination in line with the London Plan SI 13, Local Plan Policy DM25 and the New Local Plan. Each stage of the drainage hierarchy should be appropriately assessed with supporting information to demonstrate if measures could be implemented as high up the hierarchy as possible. The Drainage Strategy also requires supporting calculations on the greenfield and proposed			

Requirement Area	Flood Zone 3b (fluvial)	Flood Zone 3a (fluvial and surface water)	Flood Zone 2	Flood Zone 1
(Refer to Section 6.4.3 and Section 6.4.4 for further guidance)	development's peak discharge rates, and water storage volumes for different rainfall events with climate change allowances. These calculations need to ensure that proposed developments are designed to the Non-Statutory Technical Standards for Sustainable Drainage Systems. Maintenance and operation requirements must be designed into the proposals to ensure lifetime management of the SuDS features, in accordance with Written Ministerial Statement HCWS161. A Haringey SuDS Proforma should be provided with all planning applications that require a Drainage Strategy. For **minor developments**, Haringey currently requires that all minor development proposals should achieve a 50% reduction on the existing site run-off rates at a minimum. For **major developments**, Haringey requires that greenfield runoff rates are achieved if they are on greenfield sites. For **major developments** on current brownfield, Haringey requires that sites should also aim to achieve greenfield runoff rates; if greenfield rates cannot be achieved then justification must be provided that the runoff rate has been reduced as much as possible. Permission to connect to the local sewer network and pipes, including written confirmation that capacity exists in the network, should be sought from Thames Water in line with Local Plan policy DM29: 'On-site Management of Waste Water and Water Supply' and the New Local Plan. Evidence demonstrating that an agreement in principle for any proposed new sewer connections has been reached must be provided as part of the Drainage Strategy. Failure to do so could impact the detailed design and overall Drainage Strategy for the site. The requirement to confirm local sewer network connections is for major developments only.			
Basements (National Flood Risk Policy Requirement)	Basements should not be permitted in Flood Zone 3b.	Basement dwellings are categorised as "Highly vulnerable" infrastructure by the PPG and should not be permitted in Flood Zone 3a. Other new basement developments are restricted to Less Vulnerable / Water Compatible uses only. All basement rooms must have internal access and egress to a higher floor above the design flood level (1 in 100 year plus an appropriate allowance for climate change) which can be utilised as part of emergency evacuation procedures. All basements, including lightwells and vents that could allow water inundation, must have access thresholds raised 300mm above the 1 in 100 year plus an appropriate climate change allowance flood level. As part of any assessment, evidence needs to be submitted to confirm the local water table level.	Self-contained basement dwellings and bedrooms are not permitted in Flood Zone 2. The same rule applies to basement dwelling redevelopment works such as extensions and conversions. All basement rooms must have internal access and egress to a higher floor above the design flood level (1 in 100 year plus an appropriate allowance for climate change) which can be utilised as part of emergency evacuation procedures. All basements, including lightwells and vents that could allow water inundation, must have access thresholds raised 300mm above the 1 in 100 year plus an appropriate climate change allowance flood level. As part of any assessment, evidence needs to be submitted to confirm the local water table level.	Where there is evidence of flood risk from surface water, groundwater and / or sewer flooding in the area, a site-specific FRA is required for new and existing basement dwelling proposals (refer *Section 6.4)*. Flood mitigation measures for these sites are required to demonstrate that the development will not be impacted by flooding or have any adverse impacts on flooding locally during a 1 in 100 year event. As part of any assessment, evidence needs to be submitted to confirm the local water table level.
Finished Floor Level (EA Planning Requirement and the New Local Plan)	For new developments, finished floor levels are set at least 300mm above the 1 in 100 year return period event flood level for surface and fluvial flooding. This includes an allowance for climate change. Finished floor levels required for developments are based upon their Vulnerability Classifications: • For 'More Vulnerable' and 'Highly Vulnerable' developments on greenfield or brownfield sites and on 'Less Vulnerable' developments on greenfield sites, finished floor levels below the 1 in 100 year event with an allowance for climate change and 300mm freeboard level are not permitted. • For 'Less Vulnerable' brownfield sites, finished floor levels must follow a step-approach. Step 1 (below) must be followed unless sufficient evidence and justification is provided within an FRA that this is not reasonably practical. If Step 1 is proven to not be reasonably practical at that site, then Step 2 must be followed. This process repeats until Step 3, which is the bare minimum requirement (and only appropriate if sufficient evidence has been provided). The following steps are: 1. Ground floor finished floor levels must be above the 1 in 100 year with an allowance for climate change and 300mm freeboard level. 2. If Step 1 cannot be achieved, finished floor levels must be raised as high as possible. Passive resistance and resilience measures must be included up to the 1 in 100 year event with an allowance for climate change and 300mm freeboard level. 3. If Steps 1 and 2 cannot be achieved, finished floor levels must be raised as high as possible. Passive resistance measures must be included as high as possible. Resilience measures up to and including the 1 in 100 year event with an allowance for climate change and 300mm freeboard must be included. • For change of use developments that increase the vulnerability classification, ground floor finished floor levels must be above the 1 in 100 year event with an allowance for climate change and 300mm freeboard level. The EA's 2016 climate change allowances (including subsequent updates) must be used to incorporate the appropriate climate change allowances.			N/A
Flood Compensation Storage (National Flood Risk Policy Requirement and the New Local Plan)	If permissible development decreases the volume of a fluvial or surface water floodplain, flood storage compensation should be addressed though the following step-approach. This is a requirement within Flood Zone 3b (fluvial), Flood Zone 3a (fluvial), Flood Zone 3a (surface water) and the fluvial flood risk extent for the 1 in 100 year plus 40% climate change allowance (which covers some parts of Flood Zone 2). Please refer to the glossary for definitions. Step 1 (below) must be followed unless sufficient evidence is provided that this is not reasonably practical. If Step 1 is proven to not be reasonably practical at that site, then Step 2 must be followed. This process repeats until Step 4, which is the bare minimum requirement (and only appropriate if sufficient evidence has been provided). 1. The development must be located in areas of lowest risk on the site, mitigating the need for flood storage compensation. 2. A sequential approach should be applied to the site, with as much of the development as possible located in the areas of lowest risk. Supplementary direct level-for-level and volume-for-volume flood storage compensation must be provided for parts of the development that are not in an area of low risk. 3. The development must provide direct level-for-level and volume-for-volume flood storage compensation for the entire proposed development.			N/A

Requirement Area	Flood Zone 3b (fluvial)	Flood Zone 3a (fluvial and surface water)	Flood Zone 2	Flood Zone 1
	4. As much as possible of the development must provide direct level-for-level and volume-for-volume flood storage compensation. The development can supplement floodplain compensation with voids (refer next row). The EA's 2016 climate change allowances (including subsequent updates) must be used to incorporate the appropriate climate change allowances. Further information can be found in *Section 6.4.5.*			
Voids (National Flood Risk Policy Requirement)	Voids may be applicable for **major development** and **minor development** proposals only, please refer to the SFRA glossary for development definitions. Voids will only be considered if an applicant has followed the flood storage compensation stepped approach and provided sufficient justification within an FRA. If permissible development decreases the volume of a fluvial floodplain and flood compensation storage cannot be provided, introducing voids may be a suitable alternative. Voids are not considered floodplain compensation but flood mitigation and are to be used as a last resort for flood storage mitigation. Voids may be suitable where it is not possible to achieve all the direct compensation required or for small scale development where it can be difficult to achieve full compensation. Ideally, void openings should be a minimum of 1m long and open from existing ground levels to at least the 1 in 100 year fluvial event, plus climate change flood level. By setting finished floor levels at 300mm above the design flood level (1 in 100 year plus an allowance for climate change), there is usually enough space for the provision of voids below. The following voids mitigation specification must be adhered to if considering voids: 1. The openings to the void should extend from the existing ground level and the underside of the proposed void should be set to a minimum of the 1 in 100 year event with an appropriate allowance for climate change flood level. 2. There should be a minimum of 1m of open void length per 5m length of wall. Void openings should be provided along all external walls. 3. If security is an issue, 10mm diameter vertical bars set at 100mm centres can be incorporated into the void openings. The use of under-floor voids will typically require a legal agreement or planning condition and maintenance plan to ensure they remain open for the lifetime of the development. For small scale development different design criteria may be acceptable. Sole reliance on the use of under-floor voids to address the loss of floodplain storage capacity is not acceptable on undeveloped sites.		N/A	N/A
Impedance of Flood Flows (National Flood Risk Policy Requirement)	Any feature that may obstruct flood flows or surface water overland flow routes (embankments, walls, fencing, walls, raised land etc.) should minimise or remove the obstruction to ensure flood risk is not increased on or off site. This could be achieved by relocating these obstructions or providing openings to allow water to flow through structures e.g. permeable fencing.			
Emergency Planning (adopted Development Management DPD Policy DM 24, the New Local Plan and the Flood Risk and Coastal Change PPG)	All **new developments** will be expected to incorporate measures that effectively manage actual and residual flood risk.			N/A
	PPG defined 'Essential Infrastructure' and 'Water Compatible' use development needs to remain operational and safe in times of flood. Emergency Plans need to reflect this as these structures may assist in flooding evacuations.	PPG defined 'Essential Infrastructure' use development needs to remain operational and safe in times of flood. Emergency Plans need to reflect this as these structures may assist in flooding evacuations. Emergency Plans should include evacuation plans for all use classifications.	N/A	N/A
Residual Risk (Information is from the Flood Risk and Coastal Change PPG)	As part of the second criteria of the Exception Test, there is a requirement to show that proposed developments are safe and that any residual risks can be satisfactorily overcome. Residual risk should be mitigated through flood resilient / resistant designs and emergency planning to make sure suitable measures are in place to offer protection.			
Main River Buffer Zone (EA Planning Requirement and adopted Development Management DPD Policy DM 28 and New Local Plan)	Developments should be set back from riverbanks and existing flood defence infrastructure where possible (8m for main rivers). Developments sites within specified distances of main rivers may require a flood risk activity permit in addition to planning permissions. For non-tidal main rivers, flood risk activity permits may be required if development sites are within 8m of a river, flood defence structure or culvert. Further details on flood risk activity permits are available from the Environment Agency.			
Ordinary Watercourse Buffer Zone (adopted Development Management DPD Policy DM 28 and New Local Plan)	Development sites within 5m of ordinary watercourses require an approved ordinary watercourse consent in addition to planning permissions.			

Table 6-2. Planning Application Requirements for **Individual Sites** (Other Flood Risk Sources)

Flood Risk Source	Planning Application and Development Requirements
Groundwater Flooding	Required for all **major** and **minor** development proposals where there is a risk of groundwater flooding. Where the development site intersects with an area with >= 25% susceptibility to groundwater flooding, the applicant should address this issue by carrying out a screening study (as a minimum) to establish if there are any subterranean flood risk issues that may require further investigation. The screening study should either confirm that the potential impacts and level of risk posed by the proposed development is low (and therefore no further work is needed), or advises of the potential level of impact and the associated mitigation actions proposed. The study and any other associated assessments should be prepared by a chartered professional or specialist. Examples of specialists that have the required skills and qualifications to carry out the assessment(s) that might be required include: • Geologist • Hydrogeologist • Geotechnical Specialist Where the development includes a basement, the Screening Assessment must include the following as a minimum requirement: • Description of the proposed basement development. • Construction methods proposed. • Characteristics of the site, including geological information (bedrock, superficial deposits and aquifer confirmation) and topographical information. • Site borehole information with water levels. If historical borehole data is used, the borehole location must be within 100m of the site and have been conducted within the last 20 years to best capture the current local conditions. However, singular borehole measurements may not provide information on what subterranean conditions might look like at a different time in the year. Groundwater flow and throughflow may be subjected to seasonal influences. Therefore, it will be necessary to monitor subterranean water levels over a period of time in areas that may be more susceptible to groundwater and throughflow. • Characteristics of potential impacts (including the impact on soils, land use, water quality and hydrology with descriptions of the nature and scale of impacts, and the extent of the impacted area). • Details of mitigation measures (where appropriate). The *Groundwater, Sewer and Artificial Flood Risk Web Map* provides further information on the >=25% groundwater susceptibility information.
Sewer Flooding	Where the development site intersects with an area defined as having one or more sewer flooding records, the applicant must consult with the relevant Water and Sewerage Company to confirm if the development site has historically flooded. Where historic flooding has occurred, the applicant must show how they will effectively manage this risk for the lifetime of the development. This is required for all **major** and **minor** development proposals. Where the site is not at risk, the applicant must demonstrate that the Water and Sewerage Company has agreed in principle to any proposed new sewer connections.
Artificial Sources Flooding – Reservoirs	Required for all **major** and **minor** development proposals at risk of flooding from reservoirs. Where the application site intersects the area defined to be at risk of flooding from reservoirs, the applicant must: • Identify which reservoirs are the sources of risk (available from the *Groundwater, Sewer and Artificial Flood Risk Web Map*). • Where the site is encircled by flood water, but not necessarily at risk itself, the implications of this must be addressed in the risk management measures proposed. • Propose appropriate and proportionate risk management measures.
Artificial Sources Flooding – Other	Other sources of artificial flood risk may include small lakes or ponds. Where these exist within, or are immediately adjacent to, the development site, the applicant must identify them and propose risk management measures as appropriate. This is required for all **major** and **minor** development proposals.

6.4 Planning Applicants and Development Management

This section provides specific guidance on the key flood risk management requirements for planning applications. The guidance provides information to ensure that development proposals are compliant and provides Development Management-specific guidance to ensure that the key requirements for individual planning applications can be effectively evaluated and assessed. The guidance accompanies the information presented in *Table 6-1* and *Table 6-2.*

6.4.1 Application of the Sequential and Exception Tests

Implementation of a sequential, risk-based approach is vital in determining the suitability of a site for development with regards to flood risk. For proposed development sites that require the application of the Sequential Test, and in some instances, the Exception Test, this SFRA document and the accompanying *Web Maps* provide the basis for applying these tests at a site-specific level. It is then for the LPA to consider the extent to which the Sequential Test and Exception Test considerations have been satisfied, considering the particular circumstances in any given case.

Proposed development sites within multiple flood risk zones are classed under the highest Flood Zone present on site. For example, a site that partly falls within Flood Zone 1 and Flood Zone 2 is formally classified as a site in Flood Zone 2. The Flood Zone that each proposed site falls under helps inform the approach needed for the site and the information required for the planning application. The Sequential Test will need to be applied to steer the proposed sites to the areas with the lowest risk of flooding. If the Exception Test is required, the application is based on the highest Flood Zone the site is in and will need to be passed for the planning application.

The PPG contains information on development compatibility within different Flood Zones. This table works in conjunction with the PPG Flood Risk Vulnerability Classifications table to provide guidance on the types of development that may be considered as suitable within Flood Zones.

Sequential Test

The Sequential Test ensures that a sequential approach is followed to steer new development to areas with the lowest probability of flooding. For sites that require it but have not undergone Sequential Testing as part of the site allocations identified in Haringey's Local Plan, a site-specific Sequential Test is required. The search area and definition of reasonable available alternative sites must be determined in line with the guidance below, in consultation with the LPA. The scope should include, but is not limited to, the following, and any scope should be shared with the LPA for review and agreement prior to the Test being undertaken.

- **Search area:** The default area should be the entire borough. This can be reduced where justified by the functional requirements of the development or relevant objectives of the Local Plan. Examples of these include:
  - Functional requirements – Industrial or infrastructure developments that may service an area wider than Haringey.
  - Local Plan objectives – Regeneration of a specific area may be targeted based on objectives set in the Local Plan.
- **Reasonable available sites:** These generally include sites that are suitable (those that can accommodate the requirements of the proposed development), developable and deliverable. Sources of where these could be selected from include the following:

- List of sites prepared as part of the evidence base or background documents produced to inform the Local Plan, such as Haringey's Monitoring Report and five year housing land supply.
- Sites listed on Haringey's brownfield land register, which contains information on previously developed sites that are considered to be appropriate for residential development. This includes sites with and without planning permission.

Local Planning Authority – Development Management Considerations

Development should be considered at a strategic level, so it is important to identify how individual development proposals fit within a wider flood risk management strategy for a given area. New development should be steered to areas with the lowest probability of flooding. This means that certain development proposals should not be permitted in high and medium flood risk areas, where there are reasonably available sites appropriate for the proposed development in areas of lower flood risk. Within each Flood Zone, all sources of flooding need to be considered when applying this risk-based approach to the proposed development site.

Guidance on development in London, and the types of sites and locations to be considered, has seen a push towards certain considerations. The current London Plan (2021) identifies small site developments making an important contribution towards meeting housing objectives (Policy H2 'Small sites'). In addition, the need to adopt a sequential approach to guide development for main town centres is also of importance. This is in line with Policy SD7 'Town centres: development principles and Development Plan Documents'. These are important considerations for boroughs when considering new development proposals.

Exception Test

Following the application of the Sequential Test, if it is determined that the proposed development cannot be located in an area with a lower probability of flooding, the Exception Test should be applied. The Exception Test is designed to help ensure that flood risk to both people and property will be managed across the lifetime of the proposed development. Applicants should also ensure that climate change factors are taken into consideration over the development's lifetime. To pass the Exception Test, the PPG sets out two considerations that need to be achieved. Both considerations will need to be satisfactorily demonstrated to the LPA for development to be allocated or permitted. These considerations are:

- The development provides wider sustainability benefits to the community that outweigh flood risk, informed by a SFRA where one has been prepared; and
- A site-specific FRA 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 PPG Flood Risk Vulnerability and Flood Zone Compatibility table sets out some circumstances for Exception Test application following Sequential Testing. Evidence of Exception Testing may need to be applied for particular developments within areas subject to redevelopment or regeneration. To satisfy the Exception Test, evidence demonstrating the development proposal's sustainability benefits should be provided. The evidence should demonstrate the wider sustainability benefits that the development would bring at that specific site. This may include evidence demonstrating how the proposed development meets the objectives set out in the Sustainability Appraisal of the Local Plan and

Sustainability Appraisal of the Site Allocations DPD or evidence demonstrating policy compliance regarding affordable housing or defined housing needs for the area.

In addition, the planning and design of the development needs to demonstrate that the site will remain safe and operational during a flood event. This may involve:

- Designing buildings to avoid flooding by, for example, raising floor levels.
- Implementing resilient and / or resistant features to reduce the impact of a flood. For example, resilient features, such as installing electrical equipment above flood levels, are designed to ensure the internal elements of a property can be recovered as quickly and as cost effectively as possible. Flood resistant features, such as installing flood doors and barriers, are designed to ensure water stays out of a property up to a given height.
- Utilising SuDS as a priority.
- Mitigating the potential impacts of flooding through design and applying a sequential approach on the development site (for example ensuring more vulnerable development lies in lower risk parts of a site) and flood resilient and resistant construction.
- Developing emergency evacuation procedures. Flood warnings and / or flood alerts (these areas are included in the *Web Maps)* need to be considered along with the emergency evacuation procedures in the design and layout of the proposed development.
- Leaving space in developments for flood risk management infrastructure to be maintained and enhanced.
- Providing adequate flood risk management infrastructure which will be maintained for the lifetime of the development.
- Not increasing the size of the built footprint or through the appropriate flood compensation methods as set out in *Table 6-1.*

Applicants must also consider safe access and egress of the development throughout its lifetime. The applicant should liaise with the LPA and EA for borough-specific safe access and egress guidance. In general, as per the PPG paragraph 039, an applicant should consider the following regarding safe access and egress:

"Access considerations should include the voluntary and free movement of people during a design flood, as well as the potential for evacuation before a more extreme flood. Access and egress must be designed to be functional for changing circumstances over the lifetime of the development."

Application Exceptions

Paragraph 164 of the 2021 NPPF highlights planning application exceptions to Sequential and Exception Tests. Minor developments and change of use development proposals that fall under one of the following criteria should not be subject to the Sequential and Exception Tests:

- Householder developments within the curtilage of the existing dwelling.
- Small non-residential extensions (with a footprint of less than 250m²).
- Change of use developments – except for changes of use to a caravan, camping or chalet site, or to a mobile home or park home site.

Development proposals that fall under one of these criterion should still meet the requirements for site-specific FRAs as set out in this SFRA, the NPPF and the accompanying PPG.

6.4.2 Site-Specific Flood Risk Assessment (FRA)

Site-specific FRAs should be proportionate to the degree of flood risk, making the best use of available information. They should also be appropriate to the scale, nature and location of the development. For further information, see the 'Site-specific FRA' key requirement section in *Table 6-1* and the EA's guidance on FRAs for Planning Applications.

The site-specific FRA requires potential flood depths to be addressed as part of flood risk management and emergency planning measures where there is a probability of flooding from any flood risk source. Depending on the circumstances, certain mitigation measures will need to be employed to demonstrate that the potential impacts of flood depth will be adequately addressed. The most appropriate measure depends on a range of different factors including flood risk source, the potential impact of the flood risk, the impact of climate change on flood risk and the vulnerability classification of the development amongst others. An FRA should be provided with a planning application for developments in the following circumstances:

- All development proposals in Flood Zone 3, including minor development and change of use *[– Note minor developments include property sub-division (as this is 'development' defined by Section 55 of the Town and Country Planning Act 1990) and extensions that exceed the parameters of Permitted Development defined by Planning Portal Guidance].*
- Where major and minor developments are proposed within Flood Zone 3a (fluvial and surface water) extent (based on the *Policy Web Map*), Haringey requires the applicant to submit an FRA.
- Change of use developments that fall within the Flood Zone 3a extent and have a bearing on a site's existing drainage regime, such as a change of use development as part of a landscaping proposal, also require an FRA.
- All new development proposals in Flood Zone 2 (in line with Policy DM24 in the adopted Development Management DPD and New Local Plan).
- Proposals for development areas that are 1 hectare or greater in Flood Zone 1.
- New proposals, or a change of use in development type to a more vulnerable class, where the proposed development could be affected by sources of flooding other than rivers and the sea.
- Proposals within areas with critical drainage problems as designated by the EA [Note that this does not include Critical Drainage Areas as defined by Haringey's SWMP – there are currently no such areas defined by the EA within the borough at the time of publication of this SFRA in September 2021].
- Proposals for new development within Local Flood Risk Zones (as defined by Haringey's SWMP) may require a site-specific FRA (in line with Policy DM26 in the adopted Development Management DPD and New Local Plan).

For further guidance on the preparation and development of a site-specific FRA, the PPG has a checklist to provide guidance through the process. Further details on the requirements of emergency planning can be found in *Table 6-1.*

Local Planning Authority – Development Management Considerations

Development Management should refer this SFRA and the accompanying *Web Maps* to applicants, highlighting the key areas that could impact their proposals. For development proposals in areas at risk of fluvial flooding, there is a statutory requirement for LPAs to consult with the EA before planning

permission is granted under the Town and Country Planning (Development Management Procedure) (England) Order 2015. For advice on when the EA should be consulted, and guidance for where fluvial flood risk is an issue, the EA has developed Standing Advice. In addition, the PPG has a checklist which can aid in the process of reviewing a site-specific FRA.

6.4.3 Drainage Strategy

As part of, or separate to, site-specific FRAs, information demonstrating how surface water runoff generated by the development site will be managed may need to be presented. As FRAs are not required for all developments, producing a separate Drainage Strategy may be advisable. A Drainage Strategy is a report that demonstrates how surface water could affect a site of interest and the surrounding areas post-development.

The statement should include the proposed SuDS features which are to be incorporated in the development (to improve the existing runoff conditions), along with details for their long-term management and maintenance. Taking climate change into account, the statement needs to demonstrate how water is expected to behave on a site, determine the site's infiltration potential, runoff rates, and flow pathways, both before and after the proposed development is in place. Submitted information needs to demonstrate that the proposed development will not increase flood risk to the surrounding sites.

A strategy is required for all major developments not categorised as 'change of use'. All minor developments and developments categorised as 'change of use' which modify existing surface water drainage will also require a Drainage Strategy. For example, if a minor development or development categorised as a 'change of use' proposes to amend the landscaping, a Drainage Strategy is required.

All major development proposals that have been identified as requiring a Drainage Strategy should provide a completed Haringey SuDS Proforma. The Proforma has been divided into four sections which require applicants to demonstrate the following:

- **Site and project information** – Details of the proposed development, existing site and drainage system.
- **Proposed discharge arrangement** – Details regarding the infiltration feasibility for potential infiltration and the proposed surface water discharge method. The drainage hierarchy, which must be referred to, presented in the Sustainable Drainage Proforma is currently based on Policy SI 13 of the current London Plan and Policy 5.13 of the 2016 London Plan.
- **Drainage Strategy** – Details of the greenfield, brownfield (where relevant) and proposed discharge rates. Information regarding the proposed SuDS measures, along with their proposed catchment areas and storage capacities are also required.
- **Supporting information** – Details regarding the evidence and supporting information for the information provided in the Proforma, including proposed maintenance approaches.

DEFRA published the Non-Statutory Technical Standards for Sustainable Drainage Systems in March 2015. The document's Standards, which an application should refer to, include:

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

These Standards should be used for the implementation and assessment of a Drainage Strategy and the accompanying SuDS Proforma with planning applications. The Drainage Application Validity

Checklist can also be used for guidance on a Drainage Application. Further details on the SuDS requirements and SuDS implementation to address the impact of future growth are contained in *Table 6-1*.

6.4.4 Sustainable Drainage Systems (SuDS)

SuDS incorporate a range of measures and management techniques designed to manage surface water runoff. All new developments should incorporate SuDS in line with the Non-Statutory Technical Standards for Sustainable Drainage Systems and Policy DM25 'Sustainable Drainage Systems' in the adopted Development Management DPD of the adopted Local Plan and the New Local Plan.

SuDS incorporate a range of measures and management techniques designed to manage surface water runoff. They should mimic natural drainage approaches as closely as possible, providing an alternative to 'hard engineered' traditional drainage. SuDS provide opportunities to:

- Reduce the causes and impacts of flooding, providing opportunities to reduce the overall local flood risk through limiting surface water runoff rates and, where possible, volumes.
- Minimise pollution from urban runoff at source.
- Enable groundwater recharge where infiltration is possible.
- Combine water management with green space, providing environmental, amenity and recreational benefits.

SuDS measures should aim to achieve greenfield runoff rates, providing management and attenuation features that ensure surface water runoff is managed as close to the source as possible. Greenfield runoff conditions must be achieved for any greenfield sites. Major development on current brownfield sites should also aim to achieve greenfield runoff rates; if greenfield rates cannot be achieved then justification must be provided that the runoff rate has been reduced as much as possible. Minor developments must aim to achieve greenfield runoff rates, and at a minimum, achieve a 50% reduction on existing runoff rates. Several policy and guidance documents provide information to assist with the implementation of SuDS. In addition to the London Plan, the LSDAP and CIRIA guidance documents The SuDS Manual and Guidance on the Construction of SuDS provide important information. Haringey also provides SuDS Design Requirements and Local SuDS Standards documents for further information and requirements.

Development Management DPD Policy DM 25 (Sustainable Drainage Systems) in the adopted Local Plan is a key policy for flood risk and water resource management and will be included in the new Local Plan. The policy requires developers and applicants to follow the drainage hierarchy as laid out in the London Plan Policy SI 13 (Sustainable Drainage) (2021). Applications need to outline the SuDS measures that the proposed development will include and demonstrate how they will connect with any piped drainage system, if infiltration is not possible. The submitted evidence needs to demonstrate that the London Plan drainage hierarchy (in line with Policy SI 13 Sustainable drainage) has been followed. Surface water management features higher up the drainage hierarchy must be incorporated, if possible:

1. rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation)
2. rainwater infiltration to ground at or close to source
3. rainwater attenuation in green infrastructure features for gradual release (for example green roofs, rain gardens)
4. rainwater discharge direct to a watercourse (unless not appropriate)

5. controlled rainwater discharge to a surface water sewer or drain
6. controlled rainwater discharge to a combined sewer

Where infiltration SuDS may be suitable but have not been proposed, the applicant must provide site-specific infiltration testing or borehole data to justify use of non-infiltration-based surface water management techniques within their Drainage Strategy.

SuDS mitigation measures must be proposed based on the drainage hierarchy as described above. Some examples of mitigation measures include managing at source, using rainwater harvesting, green roofs, water butts or infiltration. Infiltration can be achieved through soakaways, permeable paving, raingardens or other appropriate management features. For further information on where infiltration SuDS may be suitable within Haringey, please see *Section 7.3.1*. Larger SuDS schemes, such as detention basins or ponds and wetlands, may be appropriate if space is available. Best practice guidance on design, construction and maintenance of SuDS mitigation measures is available from Susdrain.

Not all developments that require a planning application have a bearing on a site's existing drainage regime or have the potential to impact flood risk locally. This may include certain minor developments that do not increase the built footprint of a site, do not introduce new building structures, and/or do not alter associated landscaping. However, this needs to be demonstrated in line with Policy SI 13 of the London Plan and Policy DM25 of the Development Management DPD and New Local Plan, which require developments to demonstrate that the surface water discharge rate from the site is at the greenfield runoff rate up to a 1 in 100 year plus an appropriate allowance for climate change. If this is not achievable, proposals need to demonstrate a betterment of the current rate and justification must be provided that demonstrates that the runoff rate has been reduced as much as possible. For minor developments, Haringey requires that all minor development proposals should achieve a 50% reduction on the existing site run-off rates at a minimum. For further information, contact the LLFA. Further details on SuDS are provided in *Table 6-1*.

Local Planning Authority – Development Management Considerations

In April 2015, LLFAs became statutory consultees on major planning applications with surface water drainage implications. The associated Written Ministerial Statement HCWS161, alongside the London Plan, demonstrate the importance of applicants incorporating SuDS into their development proposals. This means that LPAs are required to consult LLFAs for expertise and technical advice on the management of surface water before reaching a decision on major planning applications under the Town and Country Planning (Development Management Procedure) (England) Order 2015.

The issues that are analysed by LLFAs and LPAs for planning applications are referred to as 'material planning considerations', issues that are relevant to the decision-making process. As stated in the Written Ministerial Statement HCWS161, SuDS are a material planning consideration for all major applications, and decisions on all planning applications require evidence that SuDS are implemented to ensure surface water is managed safely and sustainably on site. Further information on material planning considerations, planning applications and the decision-making process can be found on the Determining a Planning Application guidance page.

6.4.5 Flood Storage Compensation and Mitigation

Buildings and structures, or the raising of ground levels within the floodplain can reduce the ability to store floodwater in times of flood. This can result in an increase in the risk of flooding, as floodwater

is forced elsewhere. Any part of the development that could result in the loss of floodplain storage (buildings, land raising etc.) should provide a direct replacement of volume. Compensatory volume must be provided at the same level as the lost storage for it to be 'level-for-level' and 'volume-for-volume'. An equal volume of flood plain must be created to that taken up by the development. This equal volume must apply at all levels between the lowest point and the design flood level (1 in 100 year plus an allowance for climate change).

Level for level flood plain compensation is the preferred method of mitigation because voids, stilts or undercroft parking tend to become blocked over time by debris or domestic effects leading to a gradual loss of the proposed mitigation. If it is not possible to provide level for level flood plain compensation, then other forms of mitigation may be considered if agreed with the LPA. An FRA must demonstrate that level-for-level compensation has been considered, explain why it was not possible to provide it and detail how any associated risks from the chosen form of mitigation can be minimised.

If voids are proposed as an alternative form of mitigation these will need to be floodable, with the underside of the void above the 1 in 100 year (1% annual probability) flood level with an appropriate allowance for climate change. The LPA must also be satisfied that they can enforce a condition to maintain the voids as designed and that an adequate maintenance plan is in place to ensure the voids remain open for the lifetime of the development.

If the LPA are not satisfied that alternative mitigation measures are appropriate, then the applicant should revise their development proposals to ensure that there will be no increase in built footprint on this site

6.5 Planning Policy

6.5.1 Application of the Sequential and Exception Tests

The NPPF highlights the need for a sequential, risk-based approach to be considered for development. This approach aims to keep development out of Flood Zones 2 and 3, and areas at risk from other sources of flooding, where possible. Implementation of this approach requires proposed development sites to be reviewed through the application of the Sequential Test, and in some instances, the Exception Test. This SFRA document, and the *Web Maps*, provide the basis for applying these tests, at the site-specific level.

Strategic application of the Tests for allocated sites, if required, are generally completed as part of the Local Plan development process by LPA officers (in consultation with the EA). This process should be informed by the initial screening assessment completed for current allocated sites. Recommendations for completing a Level 2 SFRA are made in *Section 8* where further flood risk information and assessment may be required to inform the Tests. Guidance is provided in the following sections for application of the Tests at the Local Plan / strategic scale.

Sequential Test

The Sequential Test ensures that a sequential approach is followed to steer new development to areas with the lowest probability of flooding. This document provides the evidence base for the Sequential Test to be applied at a borough-wide or local level in preparation for a borough's Local Plan and associated allocated sites, depending on where the site is located.

If the application of the Sequential Test demonstrates that development can be allocated in Flood Zone 1, the applicant will have passed the Sequential Test once the proposed development has been moved

to a site in Flood Zone 1. However, some areas at lower flood risk may not be suitable for development due to various other reasons. In these instances, the Sequential Test should be applied to guide the development to the lowest risk area appropriate for the development type. This increases the possibility of facilitating development which is at the lowest risk of flooding in line with the relevant vulnerability of land use classification. The PPG flowchart demonstrating the 'Application of the Sequential Test for Local Plan Preparation' provides guidance.

The following process is recommended for the LPA to complete the Sequential Test for site allocations during Local Plan development based on the PPG's development vulnerability classification. Application of the process below is also dependent on the local Sequential Test approach (see *Section 6.5.1* for further information):

1. Complete a screening assessment of all sites to identify flood risk sources and how they might be impacted by climate change. The *Web Maps* should be used to identify flooding from all sources as detailed in *Section 5*. The potential impacts of climate change for each assessed flood risk source is also provided. Risk assessment specific guidance for the application of climate change is provided in *Section 4*.
2. Assess how long it is anticipated each development will be present for (the 'design life'). A design life of 100 years for residential development and 60 years for non-residential development is recommended if no other information is available.
3. Any 'Highly Vulnerable' developments should be located within Flood Zone 1. If this is not possible due to a lack of suitable sites, then locations in Flood Zone 2 can be considered where the Exception Test can be passed. If no suitable sites exist in Flood Zones 1 or 2, then further opportunities for development locations should be sought (this could be within or outside the borough)
4. A similar process can then be applied to 'More Vulnerable' developments with priority given to locations within Flood Zones 1 and 2. If there are no suitable sites, then Flood Zone 3a can be considered where the Exception Test can be passed.
5. 'Less Vulnerable' developments can then be located within remaining sites in Flood Zones 1, 2 and 3a (in that order of preference). This development classification is not appropriate for Flood Zone 3b.
6. 'Essential Infrastructure' should also be preferentially located in the lowest risk Flood Zone available for the type of infrastructure. This development can be in Flood Zone 3a or 3b after passing the Exception Test.
7. 'Water Compatible' development should be allocated last as they generally have the fewest constraints with regards to flood risk.

Where proposed site allocations are at a risk of flooding from one or more sources, Level 2 SFRA recommendations are made in *Section 8* for specific allocated sites. A Level 2 SFRA can provide site-specific flood risk management recommendations and an assessment of whether the site could pass the Exception Test on this basis.

Exception Test

The Exception Test should be applied after the Sequential Test if it has been determined that a proposed development cannot be located in an area with a lower flood risk. To pass the Exception Test and ensure that flood risk to both people and property is effectively managed across the proposed development's lifetime, the PPG sets out two considerations that need to be achieved. These considerations are:

- The development provides wider sustainability benefits to the community that outweigh flood risk, informed by a SFRA where one has been prepared; and
- A site-specific FRA 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 PPG's 'Application of the Exception Test for Local Plan Preparation' flowchart provides guidance on applying the Exception Test for Local Plans. The flowchart highlights that following the borough-wide level Sequential Test, the Exception Test will need to be applied if certain development sites are not in an appropriate location. Guidance for what is deemed an appropriate location is based on NPPF flood risk policy as highlighted in *Section 2.2.1*. A Level 2 SFRA may also be used to assess allocated sites in more detail to determine if the Exception Test can be passed. Recommendations for Level 2 SFRA assessments are made in *Section 8*.

6.6 Emergency Planning

Under the Civil Contingencies Act 2004, Haringey is designated as a Category 1 Responder. They are required to assess risks and respond appropriately in case of an emergency. This includes responding to a major flooding event. The Haringey responsibilities under the Act are:

a) from time to time assess the risk of an emergency occurring
b) from time to time assess the risk of an emergency making it necessary or expedient for the person or body to perform any of his or its functions
c) maintain plans for the purpose of ensuring, so far as is reasonably practicable, that if an emergency occurs the person or body is able to continue to perform his or its functions
d) maintain plans for the purpose of ensuring that if an emergency occurs or is likely to occur the person or body is able to perform his or its functions so far as necessary or desirable for the purpose of:
    i. preventing the emergency,
    ii. reducing, controlling or mitigating its effects, or
    iii. taking other action in connection with it

Section 5 of this SFRA and the accompanying *Web Maps* should be used to help the Haringey Emergency Planning Unit to help inform response requirements in line with the Civil Contingencies Act 2004. Emergency planning can use the information to tailor needs to be area and risk specific.

7 FLOOD RISK MANAGEMENT AND MITIGATION

7.1 Overview

Climate change is widely identified as the biggest factor which will increase the risk of flooding across the UK. Several key drivers, including high levels of development will see an increase in flood risk from various sources. For example, a decrease in permeable ground cover due to urban development will increase the risk of surface water flooding without mitigation.

The demand for more housing and other uses may mean a larger number of developments being proposed for sites within higher risk Flood Zones, placing them at greater risk of flooding. The combined impact of climate change, development requirements and projected future population growth will have an impact on the flood risk presented by different flood sources. In addition, it may present a greater overall flood risk to people and properties due to the accumulative risk from different flood sources. To meet flood risk mitigation requirements whilst facilitating housing development needs, local policy targeting the impact of future growth on flood risk is required.

The NPPF and accompanying PPG state that a sequential, risk-based approach to the location of development should be applied. This would enable possible flood risk to people and property to be avoided whilst taking impacts of climate change into account. This underpins the policy and site-specific recommendations for the borough. For further information, see *Section 7.7*.

7.2 The Impact of Future Growth on Flood Risk

The London Plan (2021) sets out ten-year housing targets for each LPA to help meet the demands presented by future growth. These ten-year targets are for the period 2019/20 to 2028/29. Housing targets are set in line with Policy H1 'Increasing housing supply' which provides actions and requirements to ensure that LPAs meet their ten-year target. These targets are based on the 2017 London Strategic Housing Land Availability Assessment, which is part of the London Plan evidence base.

The ten-year target set for Haringey in the current London Plan is to deliver 15,920 new homes. In line with Policy H2 'Small sites', a number of these new houses should be delivered through small sites (sites below 0.25 hectares in size) as a strategic priority. The policy provides guidance for LPAs on what they should do to support small site housing developments. The ten-year target for Haringey is to ensure that 2,600 of the 15,920 new homes delivered in this period are on small sites. At the time of writing Haringey is preparing a new Local Plan to deliver these new homes, setting out a vision for a sustainable future and providing guidance on development.

The London Plan recognises that London is at particular risk from surface water flooding, largely due to the extent of impermeable surface coverage. The projected housing targets for the ten-year period could further exacerbate surface water flood risk by introducing even more impermeable surfaces. Policy SI5 'Water infrastructure', Policy SI12 'Flood risk management', and Policy SI13 'Sustainable drainage' of the London Plan set out requirements to mitigate and manage flood risk in recognition of the pressing need for more housing. This SFRA adopts a definition for Flood Zone 3a that includes predicted surface water flood extents. The policy requirements are identical to the Flood Zone 3a (fluvial) requirements, helping the borough to manage surface water flood risk whilst addressing the need for housing. Further information on Flood Zone 3a (surface water) and relevant guidance is found in *Section 5.12.2* and *Section 5.12.3* respectively.

Haringey's adopted Local Plan Policy SP1 'Managing Growth' recognises flood risk as a natural constraint that must be taken into account during the development process. This will be brought forward in Haringey's New Local Plan. Haringey's adopted Development Management DPD Policy DM24 adopts the NPPF and PPG guidance on requirements to mitigate flood risk on new developments. Additionally, Policy DM18 of the adopted Local Plan, regarding the construction or extension of basements, states that basement construction must not, *"increase flood risk to the property and nearby properties from any source."* These policies are expected to be brought forward in Haringey's New Local Plan.

The NPPF and PPG recognise the impact of increasing development on flood risk throughout the country. They require all developments to demonstrate that they will remain safe for their lifetime without increasing flood risk elsewhere. The PPG defines the lifetime of residential developments as a minimum of 100 years unless reasons are stated otherwise. The lifetime of a non-residential development is locally defined as 60 years minimum. Information must be presented if applicants believe the individual characteristics of a proposed non-residential development means the lifetime should be something else. With the impact that an increasing number of properties could have on flood risk, it is vital that developments demonstrate that flood risk is not increased, but that flood risk is reduced overall wherever possible. To achieve these objectives, and those listed as part of the policies and guidance in Section 2, it is vital to ensure that the impact of future growth on flood risk is mitigated as much as possible.

Opportunities for the development and progression of strategic flood risk infrastructure schemes to address the cumulative impact of future growth on flood risk should be undertaken where possible using developer contributions. The main two contributions are planning obligations under Section 106 (S106) of the Town and Country Planning Act 1990 and the Community Infrastructure Levy (CIL) under Part 11 of the Planning Act 2008. S106 planning obligations allows for developers to enter into agreements with an LPA to make proposed development sites acceptable in planning terms. Similarly, CIL funding agreements allow potential for LPAs to provide contributions towards the costs of implementing infrastructure improvements required for the development of the area.

A total of 78 site allocations have been brought forward in the new Local Plan. These sites are predominantly located in the east of the borough, in Wood Green and Green Lane. The east of the borough has been identified as more vulnerable to flood risks due to a lack of green space for attenuating water. Since many of sites allocated are located on brownfield sites in this area, there is a significant opportunity to improve flood attenuation through these future developments.

In addition to the site allocations, Haringey anticipates proposals for windfall development to continue to come forward. Windfall sites are those which have not been specifically identified as available in the Local Plan process. They often comprise of previously developed sites that have unexpectedly become available. Due to their nature, it is not feasible to accurately predict where windfall development will occur in Haringey. Haringey allows for approximately 250 units per year from windfall sites distributed across the whole borough. Many are conversions from houses to flats as well as small infill development sites. It is difficult to predict where and when these sites may arise, but it is likely that they will follow similar trends of future development plans (i.e. the allocated sites). Therefore, it is expected that windfall development will also be concentrated in the east of the borough.

Windfall developments will only be accepted if they comply with all the relevant policies. If it is determined by evidence that there are insufficient sites within Flood Zone 1 to meet Haringey's housing development targets, then windfall developments in Flood Zone 2 or 3 might be acceptable and should be considered (preferably with support of a Level 2 SFRA). This would inform an approach determining locations where the Sequential Test would be passed. Conversely, if the borough has sufficient land

available in Flood Zone 1 to accommodate windfall development sites, then it may not be possible or prudent to consider windfall development in Flood Zone 2 and 3 as acceptable. Refer to Strategic Policy 1 in *Section 7.7.2* for windfall site policy recommendations.

7.3 Sustainable Strategies for Flood Risk Management in Haringey

Managing and mitigating the risk of flooding in Haringey is necessary to protect the people, property and infrastructure within the borough from flooding, now and in the future. This section outlines effective and sustainable approaches to flood risk management which are suitable for implementation within Haringey, including Sustainable Drainage Systems (SuDS) and Natural Flood Management (NFM).

7.3.1 SuDS

Although the consideration of SuDS is a requirement of all new developments, these make up only a fraction of the urbanised area of the Haringey. There are many opportunities for retrofitting SuDS within existing green and urban spaces to create appealing spaces whilst actively mitigating flooding and water quality problems. In doing this, it is important to consider the type and method of SuDS is which is suitable for areas in Haringey as this is dependent on several factors including geology, hydrology, space availability, cost and ground conditions.

Rainwater harvesting is at the top of the drainage hierarchy and should be implemented in all new developments unless there is a practical reason for not doing so. Small-scale rain harvesting techniques such as water butts can also be easily incorporated into existing developments and can be effective at in reducing overland flow draining from properties. Water butts are suitable for all land conditions even where land availability is scarce. They can also help households reduces their water consumption as the water can be reused. Haringey should encourage property owners to use water butts, especially in areas at high risk of surface water flooding.

Infiltration SuDS can only be used in areas where the underlying ground conditions are suitable. The underlying ground must have a minimum soil infiltration of 1×10^{-6} m/s to allow water to penetrate. They also should not be located in areas where there is a high risk of groundwater or in areas of contaminated land or land found to have or suspected to have issues related to soil pollution.

Since Haringey is predominantly underlaid by London Clay, infiltration SuDS are not likely possible in most areas of the borough. This is due to its impermeable geology which is associated with very low infiltration rates. However, small areas in the south-west of the borough around Highgate, are underlain by the Bagshot formation which has typically higher rates of infiltration and so may be suitable for this type of SuDS. There are also areas around Bruce Castle Park and near Woodside Park and St. Thomas Moore Catholic School where superficial deposits of Taplow Gravel Member and Boyn Hill Gravel Member may present suitable ground conditions for infiltration SuDS.

Similarly, in the western side of the borough around Muswell Hill, where there are Lowestoft Formation (Diamicton) and Dollis Hill Gravel Member (Sand and Gravel) superficial deposits. Infiltration SuDS such as soakaways and infiltration trenches, are advantageous over attenuation SuDS as they can provide complete disconnection of land from the sewer network, reducing the pressure on the drainage system. Therefore, in areas where they are suitable, they should be the priority option of surface water management.

The GLA have development the SuDS opportunity mapping tool to help identify potential SuDS opportunities within any given area, providing approximate volumes of surface water that require

managing and assigning approximate costs to the SuDS features. The outputs of this tool can be assessed in the *GLA SuDS Opportunities Web Map*.

The tool provides a high-level screening assessment of SuDS retrofitting opportunity. It proposes a combination of solutions for each site for different rainfall scenarios (1 in 2 year events, 1 in 30 year events and 1 in 30 year + 30% CC events) based on site specific conditions. The GLA Opportunity Mapping was carried out in 2016 so the climate change allowances are not consistent with what is required by Haringey (1 in 100 year + 40% CC). The +30% event has been used in the mapping as it represents the best available current information. Where multiple options are feasible, the dominant options outline the most cost-effective option based off the type of SuDS and the volume of water it can manage.

The GLA mapping *user guide* provides more detailed information of the tool's outputs and how it should be used. The *GLA SuDS Opportunities Web Map* associated with this SFRA shows the dominant SuDS opportunity for the 1 in 30 year + climate change scenario. This should be used in conjunction with the other Web Maps to help identify suitable SuDS for areas at high risk of flooding. The outputs of this GLA project should only be used to provide general guidance for SuDS suitability and opportunity – they are not suitable for use at a site-specific scale.

7.3.2 Natural Flood Management

Natural Flood Management (NFM) involves implementing measures that help to protect, restore, and emulate natural functions of catchments, floodplains, rivers, and the coast in order to reduce the risk of flooding. The EA has developed an evidence base for different NFM techniques, with several case studies on how they can be implemented and the benefits they provide for flood risk management.

The majority of Haringey's watercourses have been extensively modified and now flow underground in artificial concrete channels or pipes known as "culverts". The diversion of natural watercourses into culverted or piped structures is a historic feature of the London drainage network and was generally conducted to enable development above watercourses. Although, culverts may provide local benefits to flood risk by conveying flows away from the sites below ground, they reduce the capacity of the drainage network as a whole which can increase the risk of flooding during heavy rainfall events. Excess water from these watercourses may flow along unexpected routes at the surface (usually dry and often developed) as its original channel is no longer present and the formal drainage system cannot absorb it. Culvert failure such as collapse, or blockage is also problematic as it may result in flooding of sites even if they are in Flood Zone 1.

De-culverting and restoring rivers in areas where culverts flow beneath green spaces, presents a major opportunity for NFM within Haringey. This can reduce the risk of flooding through a number of processes

- by increasing channel roughness which 'slows the flow'.
- by reconnecting functional floodplains and creating storage ponds which increases flood storage
- by increasing the amount of water lost through evapotranspiration and infiltration.

The river restoration project that took place at the Lordship Recreation Ground demonstrates the benefits of de-culverting sections of rivers for flood risk management in Haringey. This project de-culverted the section of Moselle Brook which flowed through the park and created a new meandering channel which was planted with trees, shrub and grasses, with increase storage capacity and

appearance. It also had other wider benefits including amenity, biodiversity and community regeneration.

Other areas where future de-culverting projects could take place are:

- The Moselle Brook along the southern edge of Hartington Park.
- The section of the Moselle Brook that runs below the A109 could be diverted and de-culverted along the southern edge of Bruce Castle Park.
- The culverted Stonebridge Brook, a main river that runs beneath the green space between Ermine Road and the railway embankment. This same main river could be de-culverted in Markfield Park, prior to its outfall into the River Lee.

When developing sites located on top of or adjacent culverted watercourse in the borough, opportunities to de-culvert lost watercourse should be considered as a part of any new development, particularly for the Moselle Brook. If it is not possible to reinstate an open channel, then the culvert should not be built on and if it is in poor condition, it should be replaced or repaired.

Understanding the location and ownership of culverted watercourses is particularly important for development and flood risk. Development sites that are located on top of or adjacent to the existing culverted watercourse must take into account the condition of the culvert to ensure the culvert is strong enough to withstand potential increased loads during the construction and implementation of the proposed development and there is no short- or long-term risk to the structural integrity.

7.3.3 Strategic Locations

Strategic locations throughout Haringey have been identified as areas that could provide potential opportunities for flood risk mitigation in the future. The areas identified should be safeguarded from future development to help increase flood resilience and adaptation within Haringey. Eight sites have been identified as locations that should be safeguarded. They are all green spaces as these are currently undeveloped and should not be developed. However, one location chosen for safeguarding is within the Hale Wharf site allocation. This site is situated between the River Lee to the east and the Pymmes Brook to the west and is completely located with Flood Zone 2. It also has significant extent within Flood Zone 3a and 3b. This site has already been identified in the Screening Assessment as requiring a Level 2 SFRA. They were chosen based on one or more of the following criteria:

- The location was at the top of a RoFSW flow path, or
- The location was alongside a RoFSW flow path, or
- The location was within the boundaries of Flood Zone 2.

The sites recommended for safeguarding can be found in the *Policy Web Map*.

The site allocations which are being brought forward in Haringey's new emerging local plan can also be considered strategic locations for flood risk mitigation. The majority of these sites are brownfield and present an opportunity to improve surface water drainage through their redevelopment. There are 78 site allocations and they are outlined in *Table 8-1*. Haringey have identified 15 locations for potential SuDS schemes to reduce runoff rates and volumes. A list of these sites and the potential future SuDS schemes can be found in *Appendix C.*

7.3.4 Flood Impacts on Railway Infrastructure

The rail network within Haringey is at risk of flooding from fluvial and surface water. Development that may affect the drainage network near TfL or Network Rail assets and stations should ensure that they do not increase flood risk at these locations and reduce flood risk to these sites, if possible. All rail assets should be considered, but TfL has advised the following locations as being of concern for flooding:

- Turnpike Lane Subway and Station entrance
- South Tottenham Station entrance
- Seven Sisters Station entrance
- Northumberland Park depot

7.4 Property Level Resilience Measures

The NPPF requires that policies support appropriate measures to ensure the future resilience of communities and infrastructure against climate change impacts. This includes ensuring that developments are appropriately flood resistant and resilient. The PPG defines flood resilient developments as buildings "*designed and constructed to reduce the impact of flood water entering the building so that no permanent damage is caused*". They are also designed in a way to ensure that their structural integrity is maintained, and to ensure drying and cleaning is easier.

To assist prospective applicants, MHCLG published Improving the Flood Performance of New Buildings: flood resilient construction (2007). It provides guidance on how to improve the resilience of new properties against different flood risk sources. Details of flood resistance and resilience plans need to be provided as part of the FRA and / or Drainage Strategy submitted as part of the planning application.

Policy D11 '*Safety, security and resilience to emergency*' of the London Plan (2021) outlines property level resilience measure requirements. The policy requires that "*Development proposals should maximise building resilience and minimise potential physical risks, including those arising as a result of extreme weather, fire, flood and related hazards*". In addition, Policy GG6 '*Increasing efficiency and resilience*' states that those involved in planning and development must "*ensure buildings and infrastructure are designed to adapt to a changing climate, making efficient use of water, reducing impacts from natural hazards like flooding and heatwaves, while mitigating and avoiding contributing to the urban heat island effect.*"

Haringey's adopted Local Plan Policy SP5 '*Water Management and Flooding*' includes the accompanying requirements that management of flood risk through development must include "*Requirements for implementation of flood resilient and resistant building techniques.*" However, the adopted Local Plan Development Management DPD Policy DM 24 '*Managing and Reducing Flood Risk*' states that "*Design features may include flood resilient and resistant construction. However, the incorporation of such construction measures will not warrant justification for development in inappropriate locations.*" These policies will be brought forward into the New Local Plan.

If proposed development is categorised as a 'minor extension' or a 'vulnerable development', seethe applicant should refer to the EA Flood Risk Standing Advice information for minor extensions and vulnerable developments respectively. These provide guidance on appropriate property resistance and resilience measures.

7.5 Emergency Plans

Emergency planning is vital to ensure the potential impact of flooding is minimised. As climate change and urban development increase the risk of flooding, there is a greater need for cohesive emergency planning at strategic and site-specific levels.

Development needs to ensure that it does not impede on the emergency services or Haringey's Emergency Planning Unit's response to any flood events. A borough-wide emergency plan can provide policy context on how emergencies, including flood risk, are managed within the borough. This can help define the response structure to emergencies within the borough and provide guidance on deployment and co-ordination.

It can also provide further policy context for local Flood Warning and Evacuation Plans. Developers and prospective planning applicants need to ensure that appropriate evacuation and flood response procedures are in place and aligned to the wider strategic plan. This will help Haringey to better manage the 'actual' and 'residual' risks associated with an extreme flood event on a strategic and site-specific level.

7.6 Managing Residual Risk

Residual risks are the risks that remain after the effects of the mitigating actions have been considered. Under current climate conditions, these risks need to be quantified to ensure the remaining risks can and will continue to be safely managed. However, as climate change alters rainfall frequency, duration, and intensity, the residual risks from a mitigation measure implemented today could significantly change over time.

The London Plan (2021) identifies the importance of managing residual risk via Policy SI12 'Flood risk management'. It highlights the importance of strategies mitigating residual risk through resistance and then resilience, ensuring that safe evacuation and quick recovery to address such risks are in place. Climate change could increase the severity and impact of flooding, making it challenging for the emergency services to gain access as required. Developments should be designed with the impacts of climate change in mind to ensure that the emergency services continue to have access in extreme events. Considerations also need to be made, as a residual risk measure, to ensure that people can remain within the developments and be safe and comfortable in the unlikely event of an extreme flood. As the collective understanding of climate change increases, risks and residual risks may need to be re-evaluated. This will enable the LLFA, management companies and users to implement further control measures in the future as necessary.

Haringey's adopted Local Plan Development Management DPD Policy DM24 addresses residual risk and highlights the importance of managing residual risk at a property level. The Policy states that residual risk must be managed through the implementation of *"finished flood levels set no lower than 300mm above the 1 in 100 chance in any given year, including an allowance for climate change*" and that development must *"ensure safe access and egress for future users of the development or an appropriate emergency evacuation plan."* These measures require that developers mitigate against present and future flood risk, ensuring developments are safe throughout their lifetime and will be brought forward into the New Local Plan.

7.7 Recommended Policies

Using the findings presented throughout the SFRA as an evidence base, a set of policy recommendations for planning development and flood risk management are presented below. These recommended policies are intended to inform policy development for Haringey's new Local Plan. The policy recommendations set out strategic and site-specific principles to guide flood risk management for prospective development within the borough. The policies seek to address the cumulative impacts of increased urbanisation on strategic flood risk management issues, whilst acknowledging climate change and the necessity of development to help Haringey meet housing requirements.

7.7.1 Adopted and New Local Plan Policy Recommendations

Haringey's adopted Local Plan policies have been reviewed. *Table 7-1* was created to compare the adopted policies and the recommended policies for the New Local Plan.

Table 7-1. Adopted and recommended New Local Plan Policy

Adopted Local Plan Policy	Adopted Policy	Emerging Policy Recommendation
Strategic Policies DPD SP 5: Water Management and Flooding	The Council will require all development in Haringey to be water efficient during construction and operation and to reduce all forms of flood risk. All development shall: ▪ Improve the water environment, water quality and drainage systems; ▪ Minimise water use and illustrate how development would contribute to general and flash flooding; ▪ Take account of flood risk vulnerability classification as set out in paragraph 100 of the NPPF and will apply the NPPF Sequential Test and Exception Test; ▪ Implement measures to prevent (or mitigate as last resort) local surface water and downstream flooding; ▪ Implement Sustainable Drainage Systems from strategic to individual site level to improve water attenuation, quality and amenity; ▪ Restore and enhance the Blue Ribbon Network including Pymmes Brook, Moselle Brook, the River Lee and its tributaries, deculverting wherever feasible, to improve water quality and amenity of these waterways and to help reduce flood risk (in line with London River Action Plan); and	This policy could be enhanced through the introduction of climate change and require additional climate change requirements, in line with Recommended Policy 7.7.3 Number 1. It could also address the risk to the transport network by incorporating Recommendation Policy 7.7.2 Number 11.

	▪ Require higher resilience and levels of flood protection for critical infrastructure to ensure the protection of essential services such as water and power.	
Development Management DPD Policy DM 24: Managing and Reducing Flood Risk	A. The Council will ensure that all proposals for new development avoid and reduce the risk of flooding to future occupants and do not increase the risk of flooding	This policy could be enhanced through the adoption of Recommended Policy 7.7.2 Number 5 and Recommended Policy 7.7.3 Number 8 to ensure that developments within CDAs or defined sub-catchments do not increase flood risk elsewhere or for transport networks.
	B. All proposals for new development within Flood Zone 2 and 3a will be required to provide sufficient evidence for the Council to assess whether the requirements of the Sequential Test and Exception Test, where required, have been satisfied. Proposals must be informed by a site specific Flood Risk Assessment (FRA) taking account of all potential sources of flooding and should: a. Demonstrate the application of a sequential approach for the development of individual sites to ensure that the most vulnerable land uses are located in areas of the site that are at lowest risk of flooding; b. Preserve overland flood and flow routes and ensure there is no net loss of flood storage. Adequate flood storage and compensation should be provided on site, or if this is not possible, provided off site where circumstances allow; c. Where appropriate, set out the mitigation measures that will be incorporated on site to manage residual flood risk including: i. Finished floor levels set no lower than 300mm above the 1 in 100 chance in any given year, including an allowance for climate change, flood level; and	This policy could be enhanced through the following recommendations: B. Recommended Policy 7.7.2 Number 1 to ensure that windfall development is acceptable. B(a). Recommended Policy 7.7.2 Number 6, to ensure sites vulnerable to surface water flooding are considered. B(b). Recommendation Policy 7.7.2 Numbers 3, 4 and 9. This would solidify the requirements to make space for water and flood plain compensation requirements. Recommendation Policy 7.7.3 Numbers 4, 5 and 6 that safeguard potential water storage sites and 'dry islands.' B(c). Recommended Policy 7.7.2 Number 7, to include additional flood resistant and resilient measures for basement developments.

	ii. Ensure safe access and egress for future users of the development or an appropriate emergency evacuation plan. d. Contribute to naturalising watercourses where opportunities arise.	
	C. All proposals for new development will be required to: a. Manage and reduce surface water run-off; and b. Manage water and waste water discharges.	This policy could be enhanced through the adoption of Recommended Policy 7.7.2 Number 5, to ensure high flood risk locations minimise surface water run-off as much as possible.
	D. With the exception of water compatible uses and essential infrastructure, development in areas designated in Haringey's Strategic Flood Risk Assessment as being within Flood Zone 3b will not be permitted.	This policy could be enhanced through the adoption of Recommended Policy 7.7.2 Number 6, to minimise development in areas with high surface water flood risk.
Development Management DPD Policy DM 25: Sustainable Drainage Systems	A. All proposals for new development must seek to manage surface water as close to its source as possible in line with the London Plan drainage hierarchy.	This policy could be enhanced through the adoption of Recommended Policy 7.7.2 Number 5. Update this to include 1 in 100 year plus the appropriate climate change allowance.
	B. The Council will require Sustainable Drainage Systems (SuDS) to be sensitively incorporated into new development by way of site layout and design, having regard to the following requirements: a. All major development proposals will be required to reduce surface water flows to a greenfield run-off rate for a 1 in 100 year critical storm event; b. All minor development proposals should aim to achieve a greenfield run-off rate and, at a minimum, achieve a 50 per cent reduction on existing site run-off rates; c. All other development should seek to achieve a greenfield run-off rate and include at least one 'at source' SuDS measure resulting in a net improvement in water quantity or quality discharging to a sewer; and	This policy could be enhanced through the adoption of the following Recommendations: B(a). Recommended Policy 7.7.2 Number 5, to ensure development is reducing runoff to greenfield runoff rates including climate change. Recommended Policy 7.7.3 Numbers 2 and 3 to require a Drainage Strategy for development.

	d. For all development where a greenfield runoff rate cannot be achieved justification must be provided to demonstrate that the run-off rate has been reduced as much as possible.	
	C. Where Sustainable Drainage Systems are implemented they will be expected to: a. Meet the requirements set out in the Council's relevant local standards and guidance, or national standards where agreed; b. Incorporate measures identified in the Surface Water Management Plan; c. Be designed to maximise biodiversity and local amenity benefits, and where appropriate, ensure that SuDS techniques provide for clean and safe water at the surface; d. Improve water quality; and e. Function effectively over the lifespan of the development.	This policy could be enhanced through the adoption of Recommended Policy 7.7.2 Number 3.
	D. Where SuDS cannot be implemented due to site constraints (such as land contamination or space limitations) robust justification must be provided along with proposed alternative sustainable approaches to surface water management.	This policy could be enhanced through the adoption of Recommended Policy 7.7.3 Number 7 to promote the use of the GLA SuDS tool in-house to ensure that the justification for a lack of SuDS is appropriate.

7.7.2 Strategic

1. Haringey should implement measures through their New Local Plan to deal with the Sequential Test acceptability of windfall site development proposals at the strategic level (sites which become available for development unexpectedly). The measure could set out locations and quantities of windfall sites that would or would not be acceptable in Sequential Test terms (to provide input to the process defined in *Section 6.2*). This would help create efficiencies in the process.
2. Haringey should adopt a Catchment Based Approach (See *Section 2.2.8*) to ensure recognition of catchment-wide flood issues to justify the collection and use of S106 funding to investigate and develop flood alleviation schemes within the catchment the development falls in. CDAs defined by the borough SWMP (for surface water flooding) or policy sub-areas defined by EA CFMPs (for fluvial / tidal flooding) provide an established technical basis for this approach.
3. Haringey should incorporate the London Regional Flood Risk Appraisal (RFRA) 2018 recommendations into future Local Plan policies and documents. This includes Recommendation 2 (Fluvial Flood Risk) and Recommendation 3 (Surface Water Flood Risk) which provide

recommendations in line with Policy SI 12 and Policy SI 13 respectively of the current London Plan. The recommendations are summarised as follows:

a. Recommendation 2 – Planning policies should focus on making the most of the opportunities presented by regeneration and redevelopment on river corridors to reduce fluvial flood risk through location, layout and design of development. Opportunities should also look at flood compatibility, flood resilience and maximising open space for flood water.
b. Recommendation 3 – Developments should reduce surface water discharge in line with the Sustainable Drainage Hierarchy set out in Policy SI 13 of the London Plan, and the actions in the London Sustainable Drainage Action Plan (LSDAP) should also be taken into account.

4. Haringey should make space for water storage by identifying strategic locations that are required for current and future flood risk management. These sites may include the locations identified within this SFRA in *Section 7.3.3 and those highlighted in Section 7.3.4*. These identified areas of land should be safeguarded in the New Local Plan to facilitate links between flood risk management and other environmental priorities. Haringey should work with the LLFA, EA and TfL to identify such potential locations through flood alleviation schemes.
5. Haringey should use their New Local Plan to ensure developments within CDAs and defined sub-catchments (as listed in *Section 2.4.10*) provide increased surface water drainage requirements. Examples could include:
   a. Increased storage through the use of SuDS to restrict off-site runoff rates to greenfield (or lower) conditions.
   b. Major development must reduce their surface water runoff rate to the greenfield 1 in 100 year plus an appropriate climate change allowance runoff rates.
   c. Buildings must be made flood resistant and resilient up to the RoFSW 1 in 100 year plus an appropriate climate change allowance level for all ground floor development.
6. Haringey should consider implementation of further surface water flood risk mitigation requirements for proposed developments within Flood Zone 3a (surface water) where the development is also within the 1 in 30 year RoFSW mapped extents. These requirements could be similar to those adopted for Flood Zone 3b (fluvial) Functional Floodplain with modifications as follows:
   a. Development within the 1 in 30 year RoFSW mapped extent will be treated as if it were Flood Zone 3b (Functional Floodplain) as defined in PPG Table 1 (Paragraph 065).
   b. Development may be possible within the 1 in 30 year RoFSW mapped extents outside of existing infrastructure or solid building footprints.
   c. The development must not increase flood risk elsewhere and where possible reduce flood risk overall.
   d. Where beneficial to flood risk and/or other planning requirements, it may also be possible for development to occur within the functional floodplain through the relocation (but not increase of footprint size) of an existing building's footprint within a site.
7. Haringey should ensure that all permissible basement developments are fitted with resilience measures. This should be in line with the flood risk thresholds as detailed in *Table 6-1* and *Table 6-2*. Measures, for example, may include waterproofing of walls and floors.
8. Haringey should set up mechanisms to enable the use of CIL charges to be used for flood alleviation schemes across the borough to address the cumulative impact of development on flood risk.

9. Haringey should adopt the recommendations within this SFRA into their New Local Plan. These policies include the policies mentioned above and the following policies that have been incorporated into *Table 6-1* and *Table 6-2* regarding:
   a. Finished floor levels
   b. Flood compensation storage
   c. Voids
10. Haringey should incorporate sewer network data and create sewer catchments when they next update their SWMP. This would allow Haringey to understand sewer flood risk on a catchment specific level.
11. Haringey should include the TfL transport network within Haringey as an essential service within their Local Plan Policy relating to flood risk.

7.7.3 Site-specific

1. Haringey should require that submitted FRAs utilise the 'upper end' climate change scenarios when implementing the climate change allowances for surface water and fluvial flood risk. This would account for the worst-case scenarios.
2. Developers must submit a completed Drainage Strategy to demonstrate compliance with requirements detailed in *Table 6-1* and *Table 6-2* for all Major development proposals.
3. Drainage Strategies must be provided for all Minor developments and for Change of Use proposals if they impact the proposed development's current drainage regime. Site-specific Flood Risk Assessments with the accompanying checklist must be provided for Minor developments and Change of Use proposals if they:
   a. Are outside of Flood Zone 1.
   b. Are inside an EA defined area with a critical drainage problem.
   c. Change the existing footprint of the building(s).
   d. Are at risk from any other sources of flooding.
4. Haringey should ensure where possible that land within development sites is safeguarded for potential flood mitigation use through the active consideration of predicted flood mapping from all sources. This can be done as part of the planning process or as part of wider flood risk assessments such as a Level 2 SFRA.
5. Development proposed in 'dry islands' (areas within Flood Zone 1 that are surrounded by areas at higher risk of flooding, i.e., areas falling within Flood Zone 2 and 3) should be designed for safe access and egress in a flood event. 'Dry islands' are considered as flood risk areas due to the potential loss of important local services during flood events and lack of safe access routes. They require safe access and egress routes to be developed for the lifetime of the property, factoring in the impacts of climate change.
6. Haringey should ensure that developments maximise the use of existing green and open spaces for water to flow during times of flood. This includes green spaces around main rivers and ordinary watercourses.
7. Haringey should utilise the GLA SuDS tool to ensure that developers are following the drainage hierarchy and considering all potential options for surface water mitigation through SuDS.
8. Haringey should ensure that the TfL and Network Rail transport networks are considered by developers and ensure that drainage regimes do not impact the transport infrastructure and reduce flood risk to the transport infrastructure, if possible.

8 Review and Next Steps

8.1 Review & Updates

8.1.1 Technical Content

The SFRA has been developed using the policy, legislation and information available at the time of writing. The SFRA is intended to be used to assist various parties to consider flood risk in relation to the location and design of proposed future developments and flood risk management. It is essential that the data contained within the SFRA is as up to date as possible to ensure that decisions are made on the best information available. Events that may trigger a review and update are summarised below:

- Changes to the NPPF and associated Flood Risk and Coastal Change PPG which form the basis of the SFRA.
- Updates to any of the overarching legislation which may alter the responsibilities of Haringey.
- Significant updates to the available flood risk information used to develop the SFRA. There is a need to ensure applicants and the LPA are provided with the best information available.
- Improved understanding of local flood risk knowledge. There is a need to ensure that site-specific FRAs are informed by the most up-to-date information and planning decisions are made based on the best available data.
- Updates following any significant flood risk investigation work conducted by Haringey.
- Following a major flooding event within the borough of Haringey.

8.1.2 Mapping

The knowledge of flood risk is constantly changing and improving, and the SFRA should reflect this. This could enhance knowledge, highlighting risk areas which were not previously known, and could free up areas which were, but are no longer considered to be at risk. This approach could free up land for potential future development.

The *Web Maps* developed to support this SFRA provide a flexible platform for ensuring the most up-to-date information is available. Several Web Map layers are maintained externally by the EA and will be updated automatically when the EA publishes revised data – these layers include:

- EA Flood Map for Planning (River and Sea) - Flood Zone 2
- EA Flood Map for Planning (River and Sea) - Flood Zone 3
- EA Flood Map for Planning (River and Sea) - Areas Benefiting from Flood Defences
- EA Flood Map for Planning (River and Sea) - Flood Defences
- EA Flood Storage Areas
- EA Flood Alert Areas
- EA Flood Warning Areas
- EA Historic Flood Map
- Risk of Flooding from Surface Water Extent: 3.3% annual chance
- Risk of Flooding from Surface Water Extent: 1% annual chance
- Risk of Flooding from Surface Water Extent: 0.1% annual chance
- Risk of Flooding from Reservoirs - Maximum Flood Extent

The remaining Web Map layers are current at the date of writing this SFRA and will require updating in the future. It should be noted that the Flood Zone 3a (surface water) and 3b layers are static and will require updating under the following circumstances:

- Updated main river flood extents are made available by the EA. The EA undertake periodic review and updates of main river flood models and associated predicted flood extents.
- Updates to the RoFSW map – If RoFSW data are factored into future Flood Zone 3a and/or 3b extents (as per recommendation 6 in *Section 7.7.2*), updates would occur when Haringey undertakes local surface water flood risk studies that provide surface water flood extents to the EA to update national mapping.

8.2 Level 2 SFRA

A high-level screening assessment of current and potential future Site Allocations within Haringey was undertaken as part of this SFRA. This assessment includes a spatial analysis of the percentage of site area within each of the defined Flood Zones, the potential impact of climate change, potential interactions with other sources of flood risk, an initial appraisal on whether the Sequential Test and Exception Test are required, and a recommendation on whether assessment through a Level 2 SFRA would be appropriate. Site specific recommendations for the Site Allocations are included in Appendix B in a spreadsheet format that can be filtered on assessment parameters as required.

The assumptions applied for the assessment are summarised below:

- Flood Zone 3a (surface water) is defined using the full 1 in 100 year extent from the EA Risk of Flooding from Surface Water Map as per this Level 1 SFRA.
- The unknown vulnerability classification is 'More Vulnerable'.
- Sites with an unspecified use have been given an unknown vulnerability classification as these sites could be either 'More vulnerable' or 'Less Vulnerable' dependent on the use.
- If the proposed use is 'Estate Renewal' the vulnerability classification is assumed to be 'More Vulnerable' (residential).
- Sites with 0% of areas in Flood Zones 2 and 3a/b do not require the Sequential Test (on the basis that other forms of flood risk are generally manageable on a site-by-site basis).
- 'Less Vulnerable' sites within Fluvial Flood Zone 2 and 3a/b require the Sequential Test.
- 'More Vulnerable' sites within Fluvial Flood Zone 2 and 3a/b require the Sequential Test.
- 'More Vulnerable' sites in Fluvial Flood Zone 3a require the Sequential and Exception Tests.
- 'Less Vulnerable' and 'More Vulnerable' sites with a Flood Zone 3a (Surface Water) extent greater than 20% require a Sequential test.
- 'More Vulnerable' sites with a Flood Zone 3a (Surface Water) extent greater than 20% require a Sequential test and an Exception test.
- A Level 2 SFRA is recommended where:
- Sequential & Exception Tests are needed
- Flood Zone 3a (fluvial and / or surface water) extent is greater than 20% of site (and will be a significant constraint on development)
- The site is currently less than 20% in Flood Zone 3a (fluvial and / or surface water) but will be more than 20% under the selected climate change scenario (1 in 100 year event +35% for fluvial, 1 in 1,000 year event for surface water).

A Level 2 SFRA is a detailed assessment of all potential sources of flood risk for identified sites that require site-specific assessment.

The Level 2 SFRA builds on the strategic flood risk information presented in a Level 1 SFRA. If a Level 1 SFRA identifies that it is not possible to allocate all development outside of flood risk areas, then a Level 2 SFRA may be required. A Level 2 SFRA may also be required if it is believed that applicants will submit a high number of applications on sites that are not identified in the Local Plan.

This Level 1 SFRA has identified that not all developments can be located outside of flood risk areas. It is recommended that a Level 2 SFRA is produced to achieve the following:

- Identify the potential development sites that require a site-specific assessment.
- Complete a detailed site-specific assessment considering all sources of potential flood risk.
- Provide the information needed to apply the Exception Test where appropriate.
- Identify any site-specific requirements, including policy, mitigation measures, and FRA requirements.
- Provide a set of recommendations for each assessed site.

The Level 2 SFRA will consider flood risk from all sources now and in the future including climate change considerations as per NPPF requirements. The NPPF sets out how the planning system should help minimise vulnerability and provide resilience to the impacts of climate change. The NPPF and NPPG describe how FRAs should demonstrate flood risk will be managed over the lifetime of the development, taking climate change into account. Site-specific FRAs should confirm the impact of climate change using latest guidance. The assessment will provide details on aspects such as extent, velocity, depth, and hazard ratings. The information presented will support proposals in submitting the necessary information to meet the requirements.

The Screening Assessment identified 5 Site Allocations which require a Level 2 SFRA. These are as follows:

- **Barber Wilson:** Land between 113-125 and 145-147 Downhills Park Rd, and industrial land at the end of Crawley Rd, West Green, N22
- **Gourley Triangle (Part):** Land South of Seven Sisters Road extending west of the Mainline Railway and East to the junction of Seven Sisters Road and St. Ann's Road
- **Hale Wharf:** Land north of Ferry Lane from Pymmes Brook to the River Lea, including Hale Wharf and "The Paddock" N17
- **Wood Green Library:** Wood Green Library and Shopping Centre, Wood Green High Rd; Asian Centre, Caxton Rd, Wood Green, N22
- **Kingfisher Place:** Kingfisher Place, Coburg Road, N22

Table 8-1 Summary of all the site allocations included in the Screening Assessment

Name	Sequential Test Required?	Exception Test Required?	Level 2 SFRA Recommended?
16-54 Wood Green High Road	NO	NO	NO
18 – 20 Stroud Green Road	NO	NO	NO
311 The Roundway	NO	NO	NO
460 – 470 Archway Road	NO	NO	NO
52-68 Stamford Road	YES	NO	NO
67 Lawrence Road	NO	NO	NO
72-96 Park Road & Lynton Road	NO	NO	NO
Arena Design Centre	NO	NO	NO
Arena Retail Park	NO	NO	NO
Ashley Gardens Ashley Road South	YES	NO	NO
Ashley Road North	YES	NO	NO
Ashley Road South Canon and Berol	YES	NO	NO
Barber Wilson	**YES**	**NO**	**YES**
Bittern Place	NO	NO	NO
Broadwater Farm housing	YES	NO	NO
Bruce Grove Snooker Hall and Banqueting	NO	NO	NO
Bruce Grove Station	NO	NO	NO
Brunel Walk and Turner Avenue	NO	NO	NO
Civic Centre	NO	NO	NO
Clarendon Square	NO	NO	NO
Constable Road/Crescent	YES	NO	NO
Coppetts Wood Hospital	NO	NO	NO
Cranwood Care Home	NO	NO	NO
Crusader Industrial Estate	NO	NO	NO
Finsbury Park Bowling Alley	NO	NO	NO
Former Highgate Rail Station	NO	NO	NO
Fountayne Road	YES	NO	NO
Gonnermans Antiques and Goldsmith's Court	NO	NO	NO
Gourley Triangle (Part)	**YES**	**YES**	**YES**
Green Ridings House	NO	NO	NO
Guillemot Place	NO	NO	NO
Hale Wharf	**YES**	**YES**	**YES**
Herbert Road/Bernard Works	NO	NO	NO
High Road West	YES	NO	NO
Highgate Bowl	NO	NO	NO
Highgate School (Far field)	NO	NO	NO
Highgate School (Bishopswood Road campus)	NO	NO	NO
Highgate School (Senior School)	NO	NO	NO
Hillcrest	NO	NO	NO
Hornsey Town Hall	NO	NO	NO
Kingfisher Place	**YES**	**YES**	**YES**
Land Adjacent to Coronation Sidings	NO	NO	NO

Name	Sequential Test Required?	Exception Test Required?	Level 2 SFRA Recommended?
Land Behind Seven Sisters and Tewkesbury road	NO	NO	NO
Land between Westbury and Whymark Avenues	NO	NO	NO
Leabank View & Lemsford Close	YES	NO	NO
Mallard Place	NO	NO	NO
Mecca Bingo	NO	NO	NO
Morrison's Wood Green	NO	NO	NO
North of White Hart Lane	YES	NO	NO
Northumberland Park Estate Renewal	YES	NO	NO
Northumberland Park North	YES	NO	NO
Omega Works - Remainder of site	NO	NO	NO
Overbury and Eade Roads	NO	NO	NO
Park Grove and Durnsford Road	NO	NO	NO
Red House	NO	NO	NO
Selby Centre	NO	NO	NO
St. Ann's Hospital	NO	NO	NO
Station Road Offices	NO	NO	NO
Station Square North	YES	NO	NO
Station Square West (TH4) part - North Island and Ferry Island	YES	NO	NO
Summersby Road	NO	NO	NO
The Mall	NO	NO	NO
Tottenham Chances and Nicholson Court	NO	NO	NO
Tottenham Delivery Office	NO	NO	NO
Tottenham Hale Retail Park	YES	NO	NO
Tottenham Hale Station/ Station Interchange	YES	NO	NO
Tottenham Hotspur Stadium	YES	NO	NO
Tottenham Police Station & Reynardson Court	NO	NO	NO
Tunnel Gardens	NO	NO	NO
Turnpike Lane Triangle	NO	NO	NO
Vale and Eade Roads	NO	NO	NO
Ward's Corner	NO	NO	NO
Welbourne & Monument Way	YES	NO	NO
West Indian Cultural Centre (Clarendon Rd South North part)	NO	NO	NO
Wightman Road	NO	NO	NO
Wood Green Bus Garage	NO	NO	NO
Wood Green Cultural Quarter South	NO	NO	NO
Wood Green Library	**YES**	**NO**	**YES**

APPENDICES

A. Flood Risk Data Sources
B. Screening Assessment
C. Potential locations for SuDS schemes