# Level 2 Strategic Flood Risk Assessment

Spelthorne Borough Council

Level 2 Report

Project Number 60559796

June 2023

## Quality information

| Prepared by | Checked by | Verified by | Approved by |
|---|---|---|---|
| Tamara Provencher<br>Consultant | Sarah Littlewood<br>Principal Consultant | Emily Craven<br>Associate Director | Sarah Littlewood<br>Principal Consultant |

## Revision History

| Revision | Revision date | Details | Authorized | Name | Position |
|---|---|---|---|---|---|
| 1 | 16/03/2021 | Draft report for comment | EC | Emily Craven | Associate Director |
| 2 | 05/05/2022 | Updated with reference to latest peak river flow climate change allowances | SL | Sarah Littlewood | Principal Consultant |
| 3 | 20/07/2022 | Updated with final list of allocated sites. | SL | Sarah Littlewood | Principal Consultant |
| 4 | 22/07/2022 | Minor edits to list of sites | SL | Sarah Littlewood | Principal Consultant |
| 5 | 19/01/2023 | Revised with reference to the latest PPG and DRAFT modelling outputs for the River Thames (Windsor to Teddington) provided by the Environment Agency | EC | Emily Craven | Associate Director |
| 6 | 25/05/2023 | Updated following comments from SCC and Environment Agency and reverting to the PUBLISHED River Thames modelling (Hurley to Teddington, 2019/2020) | EC | Emily Craven | Associate Director |
| 7 | 26/06/2023 | Minor revisions | EC | Emily Craven | Associate Director |

## Prepared for:

Spelthorne Borough Council

## Prepared by:

AECOM Infrastructure and Environment UK Limited
Midpoint, Alencon Link
Basingstoke
Hampshire RG21 7PP
United Kingdom

T: +44(0)1256 310200
aecom.com

# Table of Contents



# Tables

# 1. Introduction

## 1.1 Project Background

1.1.1 The National Planning Policy Framework[1] (NPPF) and associated Planning Practice Guidance (PPG) for Flood Risk and Coastal Change[2] set out the active role Local Planning Authorities (LPAs) should take to ensure that flood risk is understood and managed effectively and sustainably throughout all stages of the planning process. The NPPF outlines that Local Plans should be supported by a Strategic Flood Risk Assessment (SFRA) and LPAs should use the findings to inform strategic land use planning. The overall approach of the NPPF to flood risk is broadly summarised in Paragraph 167:

*"When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:*

*a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location,*
*b) the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment,*
*c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate,*
*d) any residual risk can be safely managed, and*
*e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan".*

1.1.2 Spelthorne Borough Council (BC) are preparing a Local Plan which contains the overall vision and framework for future development in the area, addressing needs and opportunities in relation to housing, the economy, community facilities and infrastructure, as well as providing a basis for conserving and enhancing the natural and historic environment, mitigating and adapting to climate change, and achieving well designed places. The emerging Local Plan will set out how the local area will develop over at least the next 15 years and once adopted, will replace the 2009 Development Plan.

1.1.3 AECOM has been commissioned by Spelthorne BC to prepare a Level 1 and Level 2 SFRA to inform the ongoing preparation of the emerging Local Plan. This report and associated appendices form the Level 2 SFRA for Spelthorne BC.

## 1.2 Level 1 SFRA

1.2.1 The purpose of a Level 1 SFRA[3] prepared for Spelthorne BC is to collate and analyse the most up to date readily available flood risk information for all sources of flooding and provide an overview of flood risk issues across the Borough. The Level 1 SFRA provides guidance on:

- The application of the Sequential Test by Spelthorne BC when allocating future development sites to inform their Local Plan, as well as by developers promoting development on windfall sites. The Sequential Test is the decision-making process whereby future development is steered towards areas of lowest flood risk.
- Managing and mitigating flood risk, the application of sustainable drainage systems (SuDS), and the preparation of site-specific Flood Risk Assessments (FRAs).
- Potential flood risk management objectives and policy considerations which may be developed and adopted by Spelthorne BC as formal policies within their emerging Local Plan.

[1] Ministry of Housing, Communities and Local Government. Updated July 2021. *National Planning Policy Framework*. https://www.gov.uk/government/publications/national-planning-policy-framework--2
[2] Department for Levelling Up, Housing and Communities. Ministry of Housing, Communities and Local Government. Updated August 2022. *Planning Practice Guidance: Flood Risk and Coastal Change.* http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/
[3] AECOM, June 2023 Spelthorne Borough Council Level 1 Strategic Flood Risk Assessment.

# 1.3 Level 2 SFRA

1.3.1 The PPG states that where a Level 1 SFRA shows that land outside areas at risk of flooding now or in the future cannot appropriately accommodate all the necessary development, it may be necessary to increase the scope of the SFRA to a Level 2 to provide the information necessary for application of the Exception Test where appropriate. A Level 2 SFRA should consider the detailed nature of the flood characteristics within a flood zone including, where possible:

- flood probability,
- flood depth,
- flood velocity,
- rate of onset of flooding; and
- duration of flood

1.3.2 The Level 2 SFRA provides more detailed information about the nature of flood risk in the Borough. This will enable users to:

- apply the sequential test by identifying the severity and variation in risk *within* medium and high flood risk areas,
- establish whether proposed allocations or windfall sites, on which the emerging Local Plan will rely, are capable of being made safe throughout their lifetime without increasing flood risk elsewhere, and
- begin to apply the Exception Test, where relevant.

1.3.3 Appendix A provides borough wide mapping of flood risk datasets to enable comparison of the flood risk across the study area.

1.3.4 Appendix B provides site assessment sheets for specific sites that may be proposed for allocation within the emerging Local Plan.

## Exception Test

1.3.5 The purpose of the Exception Test is to ensure that, where it may be necessary to locate development in areas at risk of flooding, new development is only permitted in Flood Zone 2 and Flood Zone 3 where the flood risk is clearly outweighed by other sustainability factors and where the development will be safe during its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, considering climate change. Table 1-1 identifies when the Exception Test is required. It is noted that some types of development are not permitted, regardless of the application of the Exception Test.

1.3.6 Full details of the vulnerability classifications for different types of development can be found in the Level 1 SFRA and in Table 2[4] of the PPG (Flood Risk and Coastal Change).

**Table 1-1 Flood risk vulnerability and Flood Zone 'compatibility' (PPG, 2014)**

| Vulnerability Classification | | Essential Infrastructure | Highly Vulnerable | More Vulnerable | Less Vulnerable | Water Compatible |
|---|---|---|---|---|---|---|
| Flood Zone | 1 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 2 | ✓ | Exception Test Required | ✓ | ✓ | ✓ |
| | 3a | Exception Test Required [a] | × | Exception Test Required | ✓ | ✓ |
| | 3b | Exception Test Required [b] | × | × | × | ✓ [b] |

[4] *Planning Practice Guidance (PPG) flood risk and coastal change. Table 2: Flood risk vulnerability and flood zone 'incompatibility'* https://www.gov.uk/guidance/flood-risk-and-coastal-change#table2

✓ - Exception Test is not required ✗ - Development should not be permitted

*"a" In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.*
*"b" In Flood Zone 3b (functional floodplain) essential infrastructure that has passed the Exception Test, and water-compatible uses, should be designed and constructed to:*

- *remain operational and safe for users in times of flood;*
- *result in no net loss of floodplain storage;*
- *not impede water flows and not increase flood risk elsewhere.*

1.3.7 The NPPF states that for the Exception Test to be passed it must be demonstrated that:

a) the development would provide wider sustainability benefits to the community that outweigh the flood risk; and

b) 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.

1.3.8 Both elements of the test will have to be passed for development to be permitted.

1.3.9 In order to determine Part A of the Exception Test, applicants should assess their scheme against the objectives set out in the Spelthorne BC Sustainability Appraisal[5]. In order to demonstrate satisfaction of Part B of the Exception Test, relevant flood risk management and mitigation measures should be applied and demonstrated within a site-specific flood risk assessment (FRA). Chapter 5 'Managing and Mitigating Flood Risk' and Chapter 6 'Preparing Site Specific Flood Risk Assessments (FRAs)' within the Level 1 SFRA should be referred to in order to support Part B of the Exception Test.

## 1.4 Site Screening

1.4.1 A number of factors are influencing the spatial strategy in Spelthorne Borough and a large pool of sites has been under consideration during the preparation of the emerging Local Plan. Spelthorne BC have undertaken the Sequential Test and are left with a list of sites for consideration within this Level 2 SFRA.

1.4.2 AECOM have undertaken a Level 2 SFRA for each of these sites. Appendix B contains the site assessment proformas. These are listed in groups in Appendix B, reflecting the increasing risk of flooding:

- Group 1 Brownfield sites at low risk of flooding from rivers and surface water
- Group 2 Greenfield sites at low risk of flooding from rivers and surface water
- Group 3 Sites at low risk of flooding from rivers, and medium to high risk of flooding from surface water (either on the site or on the access route)
- Group 4 Sites within Flood Zone 2 as defined by historic flooding outlines not modelled flooding
- Group 5: Sites that require the Exception Test
    - Sites at risk of flooding from rivers (Flood Zone 2 or 3), with access that is dry or at low hazard rating
    - Sites wholly in Flood Zone 3, with access at low hazard
    - Sites in Flood Zone 3, with pedestrian access at low hazard
    - Sites primarily in Flood Zone 1 and 2 with no access that is dry or low hazard
    - Sites in Flood Zone 3, with no access that is dry or low hazard
    - Sites partially within Flood Zone 3b

[5] Spelthorne Borough Council (May 2022) Spelthorne Draft Local Plan Sustainability Appraisal. https://www.spelthorne.gov.uk/article/17637/Emerging-Local-Plan-Evidence-Base-and-Supporting-Documents

## 1.5 Consultation

1.5.1 Datasets have been provided by the Environment Agency, and Surrey County Council in their role as the Lead Local Flood Authority (LLFA), to inform the development of the Level 2 SFRA. The report has been circulated for review and further input by the stakeholders.

## 1.6 Future Updates to the SFRA

1.6.1 SFRAs are intended to be living documents, that are kept up to date as information on flood risk management changes.

1.6.2 The Environment Agency SFRA guidance available online[7] states that in order to remain up to date, it may be necessary to update a SFRA to incorporate any changes to:

- the predicted impacts of climate change on flood risk,
- detailed flood modelling - such as from the Environment Agency or lead local flood authority,
- the local plan, spatial development strategy or relevant local development documents,
- local flood management schemes,
- flood risk management plans,
- local flood risk management strategies,
- national planning policy or guidance.

1.6.3 The SFRA may also need to be reviewed after a significant flood event.

1.6.4 The Environment Agency are updating the modelling of the River Thames (between Windsor and Teddington) and the Lower Colne. When these datasets are published, they should be used to update the SFRA and inform flood risk assessments. The Environment Agency will use the outputs from these modelling studies to revise Flood Zones 2 and 3 on the Flood Map for Planning (Rivers and Sea)[8]. Updates are made on a quarterly basis. The Flood Map for Planning (Rivers and Sea) available online should be consulted for the most up to date Flood Zones 2 and 3a.

1.6.5 **It is noted that future changes to modelling, planning guidance, or climate change impacts may alter the level of risk posed to a specific site. The most up-to-date data must be used throughout the planning process to inform ongoing site planning and development design.**

[7] How to prepare a strategic flood risk assessment https://www.gov.uk/guidance/local-planning-authorities-strategic-flood-risk-assessment
[8] Flood Map for Planning (Rivers and Sea) https://flood-map-for-planning.service.gov.uk/

# 2. Datasets

## 2.1 Overview

2.1.1 The following datasets and sources of information have been obtained to inform the Level 2 SFRA.

## 2.2 River Modelling Outputs

2.2.1 As part of the Environment Agency's national programme of coastal and fluvial modelling studies, hydraulic models have been developed for the Main Rivers in the Borough including the River Thames, River Ash, Sweep's Ditch, Pool End Ditch and River Colne. These are described in turn in the subsections below, along with a summary of the outputs that have been used to inform the Level 2 SFRA site assessments.

2.2.2 The Environment Agency's online guidance 'Flood risk assessments: climate change allowances[9]' sets out the climate change allowances for peak river flows that should be considered. The allowances vary by management catchment which are sub-catchments of river basin districts. The management catchments of relevance to the Spelthorne study area are described in Table 2-1.

2.2.3 The guidance states that for SFRAs the *central* and *higher central* allowance should be used. When preparing site specific FRAs, the allowance that should be considered is based on the Flood Zone and the vulnerability classification of the development. For example, where More Vulnerable development is proposed in Flood Zone 3, the *central* allowance should be applied.

2.2.4 The allowances that have been used within this Level 2 SFRA are detailed in the subsections below. These take into account the allowance specified in the guidance (as noted in Table 2-1) as well as considering what modelled flood extents are available within the received models.

**Table 2-1 Peak river flow allowances for management catchments in Spelthorne (use 1961 to 1990 baseline)**

| Management Catchment | Allowance category | Total potential change anticipated for '2020s' (2015 to 2039) | Total potential change anticipated for '2050s' (2040 to 2069) | Total potential change anticipated for '2080s' (2070 to 2115) |
|---|---|---|---|---|
| London Management | Upper end (95th) | 26% | 30% | 54% |
| | Higher central (70th) | 14% | 14% | 27% |
| | Central (50th) | 10% | 7% | 17% |
| Colne Management | Upper end (95th) | 30% | 38% | 72% |
| | Higher central (70th) | 16% | 16% | 35% |
| | Central (50th) | 10% | 8% | 21% |
| Maidenhead and Sunbury Management | Upper end (95th) | 32% | 45% | 81% |
| | Higher central (70th) | 19% | 25% | 47% |
| | Central (50th) | 14% | 17% | 35% |

### River Thames

2.2.5 As part of the Lower Thames, Jubilee River and River Ash Modelling Study[10], a 1D-2D model was developed to provide high resolution floodplain mapping of the Lower Thames catchment between

[9] Environment Agency (published 2016 and updated May 2022) Flood risk assessments: climate change allowances. https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances
[10] Lower Thames, Jubilee River and River Ash Modelling Study, JBA Consulting, July 2020.

Marlow and Hammersmith as well as enabling the impact of the proposed River Thames Scheme (RTS) updates to be tested and the economic impacts to be quantified in more detail.

2.2.6 Modelled flood extents have been developed for events where the River Thames represents the main source of flooding (Thames dominated) and conversely when the tributaries are the key source of flooding (Tributary dominated). The Thames dominated outputs are of primary relevance to Spelthorne. However, in some locations, (e.g. between River Wraysbury and River Colne), the risk of flooding appears to be greater in the Tributary dominated modelling and therefore both sets of modelling have been displayed within the Level 2 SFRA for completeness.

2.2.7 The following scenarios were undertaken:

- Defended scenarios for the following Annual Exceedance Probability (AEP) events: 50%, 20%, 10%, 5%, 3.33%, 2%, 2%, 1.33%, 1%, 0.5%, 0.1%. The 3.3% AEP flood extent has been used as the starting point from which to delineate Flood Zone 3b Functional Floodplain for Spelthorne BC, as mapped in the Level 1 SFRA and the site assessments in Appendix B.
- Climate change scenarios: Increases in peak flows of 10%, 20%, 25%, 35% and 81% have been applied to the 1% AEP modelled event. For areas in the London management catchment these modelled outputs provide good coverage for the central allowance (17%) and higher central allowance (27%). For areas in the Maidenhead and Sunbury management catchment, the 35% allowance is suitable for the central allowance (35%) and the 81% allowance could be used as a conservative outline for the higher central (47%).
- Undefended scenarios for the 1% and 0.1% AEP events (to inform the development of Flood Zones 3 and 2 respectively on the Flood Map for Planning (Rivers and Sea)).

2.2.8 The following outputs were produced from the modelling: maximum flood extent, maximum depth, maximum velocity, maximum hazard rating, maximum water level. It is noted that information on the rate of onset of flooding and the duration of flooding has not been made available from these datasets.

2.2.9 Maps showing the maximum flood depths and hazard rating for the 1% AEP including 35% allowance for climate change are included in **Appendix A Figure 1 and 2 (Thames dominated flooding),** and **Appendix A Figure 3 and 4 (Tributary dominated flooding)**, and the site proformas (Appendix B) where required.

2.2.10 Flood 'hazard' categorises the danger to people for different combinations of flood water depth and velocity. The derivation of these categories is based on the methodology set out by Defra in Flood Risks Assessment Guidance for New Development FD2320/TR2[11] using the following equation:

*Flood Hazard Rating = ((v+0.5)*D) + DF Where v = velocity (m/s), D = depth (m), DF = debris factor*

| Flood Hazard | | Description |
|---|---|---|
| Low | HR < 0.75 | Caution – Flood zone with shallow flowing water or deep standing water |
| Moderate | 0.75 ≥ HR ≤ 1.25 | Dangerous for some (i.e. children) – Danger: flood zone with deep or fast flowing water |
| Significant | 1.25 > HR ≤ 2.0 | Dangerous for most people – Danger: flood zone with deep fast flowing water |
| Extreme | HR > 2.0 | Dangerous for all – Extreme danger: flood zone with deep fast flowing water |

2.2.11 **The Environment Agency are updating the River Thames model (between Windsor and Teddington). When these datasets are published, they should be used to update the SFRA and inform flood risk assessments. The Environment Agency will use the outputs from these modelling studies to revise Flood Zones 2 and 3 on the Flood Map for Planning (Rivers and Sea). Updates are made on a quarterly basis. The Flood Map for Planning (Rivers and Sea) available online should be consulted for the most up to date Flood Zones 2 and 3a.**

[11] Defra and Environment Agency (2005) FD2320/TR2 Flood Risk Assessment Guidance for New Development.

## River Ash

2.2.12 The River Ash Modelling Update[12] was completed in 2019 and forms part of the wider-arching Lower Thames, Jubilee River and River Ash Modelling study (JBA July 2020), examining river flood risk along two particular tributaries of the River Thames:

- The River Ash, a tributary of the River Colne in Staines-Upon-Thames; and
- Staines Aqueduct, a man-made channel mainly used for water supply purposes by Thames Water.

2.2.13 The following scenarios were undertaken:

- Defended scenarios for the following AEP events: 50%, 20%, 10%, 5%, 3.33%, 2.5%, 2%, 1.33%, 1%, 0.5%, 0.1%. The 3.3% AEP flood extent has been used as the starting point from which to delineate Flood Zone 3b Functional Floodplain for Spelthorne BC, as mapped in the Level 1 SFRA and the site assessments in Appendix B.
- Climate change scenarios: 15%, 25%, 35% and 70% increase in peak flows applied to the 1% AEP modelled event. For areas in the London management catchment these modelled outputs provide good coverage for the central allowance (17%) and higher central allowance (27%).
- Undefended scenarios for the 1% and 0.1% AEP events (to inform the development of Flood Zones 3 and 2 respectively on the Flood Map for Planning (Rivers and Sea)).

2.2.14 The following outputs were produced from the modelling: maximum flood extent, maximum depth grid, maximum velocity, maximum hazard rating, maximum water level.

2.2.15 Maps showing the maximum flood depths and hazard ratings for the 1% AEP including 35% allowance for climate change are included in **Appendix A Figure 5 and 6**, and the site proformas in Appendix B where required.

2.2.16 It is noted that information on the rate of onset of flooding and the duration of flooding has not been made available from these datasets.

## River Colne Modelling

2.2.17 Modelling of the River Colne was supplied by the Environment Agency from the Lower Colne Modelling and Mapping Study[13]. The model is a 1D-2D linked model. The section within the Spelthorne Borough is solely in 1D.

2.2.18 The following scenarios were undertaken:

- Defended scenarios for the following AEP events: 50%, 20%, 10%, 5%, 2%, 1% and 0.1%. The 2% AEP flood extent has been used as the starting point from which to delineate Flood Zone 3b Functional Floodplain for Spelthorne BC, as mapped in the Level 1 SFRA and the site assessments in Appendix B.
- Climate change scenarios: 20% increase in peak flows applied to the 1% AEP modelled event in accordance with the Environment Agency guidance 2011 and UKCIP09. Modelling results for the full suite of new allowances, as set out in Table 2-1, are not currently available. It is not currently within the scope of this SFRA to re-run the River Colne model to account for the new climate change allowances. As noted in Table 2-1, the central allowance for the Colne management catchment is 21% and therefore the available dataset is a suitable reference point. In the absence of any further modelled climate change scenarios it is proposed to use the 1 in 1000 year (0.1% AEP) defended outline as a proxy for the higher central (35%) climate change outline within this Level 2 SFRA.
- Undefended scenarios for the 1% and 0.1% AEP events (to inform the development of Flood Zones 3 and 2 respectively on the Flood Map for Planning (Rivers and Sea)).

2.2.19 The following outputs were produced from the modelling: maximum flood extent, maximum depth grid, maximum velocity, maximum hazard rating, maximum water level. However, it is noted that hazard and

[12] JBA Consulting, 2019, River Ash Modelling Update.
[13] Mott MacDonald, April 2012, Lower Colne Modelling and Mapping Study.

velocity outputs are only available for those sections of the model in 2D, and it is therefore not available for the Spelthorne Borough.

2.2.20 **Appendix A Figure 7** shows the maximum flood depth map for the 0.1% AEP modelled event. This is included in the site proformas in Appendix B, where required.

2.2.21 **The Environment Agency are updating the Lower Colne model. When these datasets are published, they should be used to update the SFRA and inform flood risk assessments. The Environment Agency will use the outputs from these modelling studies to revise Flood Zones 2 and 3 on the Flood Map for Planning (Rivers and Sea). Updates are made on a quarterly basis. The Flood Map for Planning (Rivers and Sea) available online should be consulted for the most up to date Flood Zones 2 and 3a.**

# 2.3 Risk of Flooding from Surface Water

## Flood Extents

2.3.1 The Environment Agency's Risk of Flooding from Surface Water (RoFSW) mapping includes GIS layers showing the extent of flooding from surface water that could result from a flood with a 3.33%, 1% and 0.1% chance of happening in any given year.

2.3.2 It is noted that the Risk of Flooding from Surface Water is not to be used at property level. Because of the way they have been produced and the fact that they are indicative, the maps are not appropriate to act as the sole evidence for any specific planning or regulatory decision or assessment of risk in relation to flooding at any scale without further supporting studies or evidence. However, the mapping provides a useful source of information to identify the risk of surface water flooding to the wider area in which a site is located, and the general patterns of surface water flow and ponding.

2.3.3 Mapping for the whole study area is included in the Level 1 SFRA, Appendix B Figures 11A-11D. Mapping local to each of the sites considered in this Level 2 SFRA is provided in the site proformas in Appendix B.

# 2.4 Groundwater Flooding

## Areas Susceptible to Groundwater Flooding

2.4.1 Areas Susceptible to Groundwater Flooding (AStGWF) is an Environment Agency dataset included within the Level 1 SFRA[3]. It is a strategic scale map showing where groundwater flooding could occur. It shows the proportion of each 1km grid square where geological and hydrogeological conditions indicate that groundwater might emerge.

2.4.2 The susceptible areas are represented by one of four categories showing the proportion of each 1km square that is susceptible to groundwater emergence. It does not show the likelihood of groundwater flooding occurring.

- <25%
- >=25%<50%
- >=50%<75%
- >=75%

2.4.3 The absence of values for any grid square means that no part of that square is identified as being susceptible to groundwater emergence. The map identifies areas where further investigation is needed to assess whether groundwater flooding may affect property or infrastructure.

2.4.4 Mapping for the whole study area is included in the Level 1 SFRA, Appendix B Figure 12.

### BGS Susceptibility to Groundwater Flooding

2.4.5 The British Geological Survey (BGS) dataset 'Susceptibility to Groundwater Flooding' is mapped within the Surrey County Council Local Flood Risk Management Strategy[14] (LFRMS) and has been referred to within the Level 2 SFRA.

2.4.6 The information shown in the Susceptibility to Groundwater Flooding mapping is based on conceptual understanding of the regional geology and hydrogeology and is therefore only an indication of where groundwater flooding may occur. It does not indicate hazard or risk, any information on the depth to which groundwater flooding may occur, nor the likelihood of the occurrence of an event of a particular magnitude. This information should not be used in isolation to make planning decisions at any scale or to indicate the risk of groundwater flooding, but it does provide a high level overview of the potential for groundwater flooding. The map shows the following information:

- **Limited potential for groundwater flooding to occur**: In this area there is a limited potential, based on an understanding of the underlying geology and hydrogeological conditions, that groundwater flooding may occur.
- **Potential for groundwater flooding of property situated below ground level**: In this area there is the potential, based on an understanding of the underlying geology and hydrogeological conditions, that groundwater flooding may occur in property or infrastructure below ground level, such as basements.
- **Potential for groundwater flooding to occur at surface**: In this area there is the potential, based on an understanding of the underlying geology and hydrogeological conditions, that groundwater flooding may occur above the ground.

2.4.7 All other areas are not considered to be prone to groundwater flooding.

## 2.5 Reservoir Flooding

2.5.1 The Environment Agency Long Term Flood Risk Map[15] identifies those areas that could flood in the unlikely event that a reservoir failed.

2.5.2 The likelihood of reservoir flooding is much lower than other forms of flooding. Current reservoir regulation, which has been further enhanced by the Flood and Water Management Act, aims to make sure that all reservoirs are properly maintained and monitored in order to detect and repair any problem[16].

## 2.6 Historic Flood Records

### Recorded Flood Outlines

2.6.1 The Borough has a history of significant flooding events, specifically from the River Thames, with major events occurring in 1894, six between 1900 and 1929, 1947, 1959, 1974, 2003 2009, 2012 and 2013/2014. The Environment Agency dataset 'Recorded Flood Outlines' has been used to inform the Level 2 SFRA site assessments.

### Lead Local Flood Authority Records

2.6.2 In their role as the LLFA, SCC has duties to record and investigate flood incidents relating to local sources of flooding, namely flooding from surface water, groundwater and ordinary watercourses. SCC has provided a number of GIS layers to inform the Level 1 SFRA that relate to past flood events. These datasets are presented spatially in the Level 1 SFRA Appendix A Figures 11A-11D.

2.6.3 A summary of each dataset as provided below:

[14] Surrey County Council, 2017, Local Flood Risk Management Strategy Refresh. https://www.surreycc.gov.uk/people-and-community/emergency-planning-and-community-safety/flooding-advice/more-about-flooding/surrey-local-flood-risk-management-strategy
[15] Long Term Flood Risk Map https://flood-warning-information.service.gov.uk/long-term-flood-risk/map
[16] Press Release: 'Reservoir flood maps published' https://www.gov.uk/government/news/reservoir-flood-maps-published

- **Internal property flooding**: road locations along which internal property flooding has been reported to SCC.
- **External property flooding**: road locations along which external property flooding has been reported to SCC.
- **Historical Flooding Incidents**: indicative road location along which a flood event has occurred that has been investigated by SCC and a Section 19 Flood Investigation Report has been prepared.
- **SCC Wetspots**: 'Wetspot' is a term used by SCC as the LLFA to describe the location of a surface water flooding incident that has been reported. The wetspot database is continually updated to produce a comprehensive map and record of all the identified wetspots in Surrey. Information from Surrey risk management authorities informs the database. SCC currently prioritises capital works at wetspots throughout the county based on a number of factors. These factors include safety, internal property flooding, social impact and duration of flooding. Details of these specific factors have not been supplied for the purposes of the SFRA.

2.6.4 An updated version of the SCC wetspot dataset was provided in December 2021 for use within this Level 2 SFRA site assessments.

## Sewer Flooding Records

2.6.5 Thames Water provided an extract from their register of flooded properties for the study area to inform the Level 1 SFRA. This shows properties that have been affected by sewer flooding (as reported to Thames Water) within the last 20 years. Due to data protection requirements, this data has not been provided at the individual property level; rather the register comprises the number of properties within 4 digit postcode areas that have experienced flooding, either internally or externally, over the last 20 years. It should be noted that it is likely that there have also been unreported sewer flooding incidents in this area over this time period.

2.6.6 This data has also been referred to within the Level 2 SFRA site assessments.

# 3. Level 2 SFRA Site Assessments

## 3.1 Proforma template

3.1.1 Site assessment proformas are included in Appendix B. Table 3-1 provides an overview of the fields in the proforma and the source of the information or dataset. An overview of the risk of flooding is provided, based on the available datasets, followed by recommendations for how development could be delivered on the site to meet part (2) of the Exception Test.

**Table 3-1 Datasets and information used for Level 2 Site Proformas**

| Proforma Field | Dataset / information used |
|---|---|
| **Site Description** | |
| **Site Name and ID** | As provided by Spelthorne BC (Excel sheet and GIS layer of sites). |
| **Area (ha)** | The area of the site (hectares). |
| **Proposed use** | As provided by Spelthorne BC. **Where this was not specified, mixed-use including residential has been assumed to provide a conservative assessment of the site.** |
| **Vulnerability classification** | Defined in accordance with PPG Flood Risk and Coastal Change Table 1. |
| **Flood Zone and Historic Flooding** | |
| **Proportion within each Flood Zone and Areas Benefitting from Defences** | Flood Map for Planning (Rivers and Sea) Flood Zone 2; Flood Map for Planning (Rivers and Sea) Flood Zone 3; Flood Map for Planning (Rivers and Sea) Areas Benefitting from Defences; Level 1 SFRA Flood Zone 3b Functional Floodplain outline. |
| **Flood Warning Area** | Environment Agency Flood Warning Areas. |
| **Recorded River Flooding Outlines in which the site is located** | The dates of the flood events that have affected the site, as detailed in the Environment Agency 'Recorded Flood Outlines' dataset and mapped in Level 1 SFRA Appendix B Figures 9A and 9B . |
| **Number of flood records within 500m of the site, (road locations along which there have been reported incidents of flooding from surface water, groundwater or ordinary watercourses):** | The number of historic records of flooding from surface water, groundwater or ordinary watercourses within 500m of the site, as detailed in datasets provided by Surrey County Council for the Level 1 SFRA described in Section 2.6 of this report, and the SCC Wetspots dataset. These datasets are all supplied as roads along which flood incidents have been recorded rather than individual properties or point locations. |
| **Sewer flooding records within the post code area in which the site is located:** | As provided by Thames Water for the Level 1 SFRA and described in Section 3.5 of the Level 1 SFRA Report. |
| **River Flooding** | |
| **Maximum Flood Depth Map** | Maximum flood depth map(s) for the watercourses relevant to the site (River Thames / Thames Tributaries / River Ash / River Colne), as described in Section 2.2. |
| **Maximum Flood Hazard Map** | Maximum flood hazard map(s) for the watercourses relevant to the site (River Thames / Thames Tributaries / River Ash), as described in Section 2.2. |
| **Surface Water Flooding** | |
| **Risk of Flooding from Surface Water Map** | Environment Agency dataset obtained from the Defra Data Services Platform. |
| **Groundwater Flooding** | |
| **Bedrock Geology** | Bedrock geology underlying the site, based on BGS mapping. |
| **Superficial Geology** | Superficial geology underlying the site, based on BGS mapping. |
| **Areas Susceptible to Groundwater Flooding** | The susceptible areas are represented by one of four categories showing the proportion of each 1km square that is susceptible to groundwater emergence. It does not show the likelihood of groundwater flooding occurring. |
| **BGS Susceptibility for Groundwater Flooding** | A BGS dataset mapped within the Surrey County Council LFRMS[14] which gives a high level overview of where groundwater flooding may occur based on a conceptual understanding of regional geology and hydrogeology. Described further in Section 2.4. |
| **Aquifer Designation** | The aquifer designations of the underlying bedrock geology and the underlying superficial geology. |
| **Other sources** | |
| **Flooding from reservoirs** | As identified on the Environment Agency Long Term Flood Risk Map[15]. |
| **Summary** | |
| An overview of the risk of flooding to the site now and in the future (as a result of the impacts of climate change) based on the information within the proforma. | |
| **Site Specific Recommendations** | |
| Recommendations for how development could be delivered on the site to meet the requirements of part 2 of the Exception Test (where required) i.e. that it will be safe for its lifetime, without increasing flood risk elsewhere and where possible reduce flood risk overall. Recommendations are made in line with the development management measures presented within the Level 1 SFRA[3] (Chapter 5) and typically address the following: | |

- Applying sequential approach within development site,
- Setting back development from the edge of watercourses,
- Finished floor levels,
- Floodplain compensation storage,
- Access and egress arrangements,
- Flood warning and evacuation procedures,
- Surface water management,
- Further investigation of groundwater levels.

## 3.2 Sites at low risk

3.2.1 The following tables summarise the findings that are within the site proformas in Appendix B. The sites are grouped in the following tables based on increasing risk of flooding. Consideration has been made of the flood risk to the site as well as the access routes to and from the sites.

3.2.2 Where residential development (More Vulnerable) is proposed on the sites within Table 3-2, Table 3-3, Table 3-4 and Table 3-5, the Exception Test is not required.

3.2.3 Development proposals for these sites should seek to restrict surface water runoff rates to greenfield rates; demonstrate sustainable approaches to the management of surface water making use of SuDS; and incorporate soft landscaping, planting, and permeable surfacing.

3.2.4 A preliminary Hydrogeological Risk Assessment (HRA) should be undertaken to determine ground conditions and groundwater levels in proximity to the site, and to identify whether the proposed development will impact on groundwater, either from subsurface construction or from changes to surface water drainage. Should the preliminary HRA identify potential for impact, a full HRA should be prepared to identify proposed mitigation measures.

**Table 3-2 Brownfield sites at low risk of flooding from rivers and surface water**

| Site ID | Area (ha) | Address | Units | Land Type | Year in Local Plan |
|---|---|---|---|---|---|
| AT3/009 | 0.26 | Ashford Telephone Exchange, Church Road | 20 | URBAN, PDL | Years 11-15 |
| AT3/016 | 0.24 | 23-31 (not 11-19), Woodthorpe Road | 120 | URBAN, PDL | Years 1-5 |
| SC1/006 | 3.75 | Tesco Extra, Escot Road | 225 | URBAN, PDL | Years 6-10 |
| SE1/005 | 0.8 | Benwell House, Green Street | 39 | URBAN, PDL | Years 1-5 |
| SE1/020 | 0.43 | Sunbury Adult Education Centre, The Avenue | 30 | URBAN, PDL | Years 6-10 |
| SE1/025 | 0.25 | Elmbrook House, 18-19, Station Road | 50 | URBAN, PDL | Years 6-10 |

**Table 3-3 Greenfield sites at low risk of flooding from rivers and surface water**

| Site ID | Area (ha) | Address | Units | Land Type | Year in Local Plan |
|---|---|---|---|---|---|
| HS1/009 | 4.88 | Bugle Nurseries, 171, Upper Halliford Road | 79 | GB, MIXED | Years 1-5 |
| HS1/012b | 2.34 | Land east of Upper Halliford Road (Site B), Upper Halliford Road | 41 | GB, GF | Years 6-10 |
| LS1/024 | 1.62 | Land at Staines Road West and Cedar Way, Staines Road West | 77 | GB, GF | Years 1-5 |
| SN1/006 | 4.83 | Land to the west of Long Lane and South of Blackburn Trading Estate, Long Lane | 200 | GB, GF | Years 1-5 |
| ST1/043 | 0.27 | Land East of 355, London Road | 3 | GB, GF | Years 1-5 |

**Table 3-4 Sites at low risk of flooding from rivers, and medium to high risk of flooding from surface water (either on the site or on the access route)**

| Site ID | Area (ha) | Address | Units | Land Type | Year in Local Plan |
|---|---|---|---|---|---|
| AE3/006 | 1.31 | 158-166, Feltham Road | 75 | URBAN, PDL | Years 6-10 |
| AS1/001 | 3.98 | Tesco Extra, Town Lane | 350 | URBAN, PDL | Years 6-10 |

| | | | | | |
|---|---|---|---|---|---|
| AS1/003 | 0.43 | Staines Fire Station, Town Lane | 50 | URBAN, PDL | Years 6-10 |
| AS1/011 | 0.3 | Land at Former Bulldog Nurseries, London Road | 24 | GB, GF | Years 1-5 |
| AS2/001 | 0.25 | Ashford Youth Club, Kenilworth Road | 5 | URBAN, PDL | Years 11-15 |
| AS2/006 | 3.33 | Land east of Desford Way, Desford Way | 15 | GB, GF | Years 1-5 |
| AT1/002 | 1.15 | Ashford Sports Club, Woodthorpe Road | 108 | GB, GF | Years 1-5 |
| AT3/007 | 0.2 | Ashford Multi-storey car park, Church Road | 55 | URBAN, PDL | Years 1-5 |
| HS1/002 | 1.68 | Land at Croysdale Avenue, Croysdale Avenue | 67 | GB, GF | Years 1-5 |
| HS1/012 | 1.6 | Land East of Upper Halliford, Nursery Road | 60 | GB, GF | Years 1-5 |
| HS2/004 | 0.66 | Land South of Nursery Road, Nursery Road | 41 | GB, GF | Years 1-5 |
| SE1/008 | 0.25 | Telephone Exchange, Green Street | 14 | URBAN, PDL | Years 11-15 |
| SN1/005 | 1.75 | Land at Northumberland Close, Northumberland Close | 80 | GB, GF | Years 11-15 |
| SN1/012 | 2.19 | Stanwell Bedsits, De Havilland Way | 175 | URBAN, PDL | Years 11-15 |
| ST2/006 | 1.36 | Builders Yard, Gresham Road | 343 | URBAN, PDL | Years 11-15 |

**Table 3-5 Sites within Flood Zone 2 as defined by historic flooding outlines not modelled flooding**

| Site ID | Area (ha) | | Units | Land Type | Year in Local Plan |
|---|---|---|---|---|---|
| SC1/013 | 0.25 | RMG Warehouse & Delivery Office, 47-79, Staines Road West | 22 | URBAN, PDL | Years 11-15 |
| SC1/019 | 0.23 | Sunbury Social Services Centre, 108 Vicarage Road | 11 | URBAN, PDL | Years 11-15 |
| SC1/021 | 2.1 | Land at Spelthorne Grove, Spelthorne Grove | 250 | URBAN, PDL | Years 11-15 |
| SE1/003 | 0.75 | Builders Yard, Staines Road East | 75 | URBAN, PDL | Years 11-15 |
| SE1/024 | 0.97 | Annandale House, 1, Hanworth Road | 295 | URBAN, PDL | Years 1-5 |

## 3.3 Sites that require Exception Test

3.3.1 The remainder of the sites are at greater risk of flooding and require the application of the Exception Test. Table 3-6 provides a high level summary of the sites and the information in each site proforma (Appendix B).

### Table 3-6 Summary of flood risk issues and constraints for sites that require the Exception Test

| Legend | Likelihood of meeting the requirements of part (B) of the Exception Test |
|---|---|
| | Development could be delivered to meet the requirements of part (B) of the Exception Test. |
| | Significant constraints identified, such as requirements for safe access and/or floodplain compensation storage. Further discussion required with stakeholders to determine likelihood of meeting the requirements of part (B) of the Exception Test. |
| | Unlikely to meet the requirements of part (B) of the Exception Test. |

| Site ID | Area | Address | Units | Land Type | Flood Zone 1 | Flood Zone 2 | Flood Zone 3a | Flood Zone 3b | Summary |
|---|---|---|---|---|---|---|---|---|---|
| Sites at risk of flooding from rivers (Flood Zone 2 or 3), with access that is dry or at low hazard rating | | | | | | | | | |
| RL1/011 | 6.06 | Land at Staines and Laleham Sports Club, Worple Road | 52 | GB, GF | 18 | 72 | 10 | 0 | Site is at Low and Moderate hazard. Access/egress that is dry or at low hazard during the 1% AEP event including 35% climate change allowance is available for the site, along Worple Road north to Kingston Road, and then east to the A308.<br>Development of the site must ensure that the risk of flooding to surrounding areas is not increased, and where possible is reduced. Therefore, any increase in building footprint within the design flood extent (1% AEP including climate change) will need to be compensated on a level for level and volume for volume basis within the site. |
| ST1/031 | 0.26 | Thameside Arts Centre, Wyatt Road | 19 | URBAN, PDL | 0 | 100 | 0 | 0 | Site is at Low and Moderate hazard. Access that is at low hazard during the 1% AEP event including 35% climate change allowance is achievable via Wyatt Road or Edgell Road, onto Budebury Road and then Gresham Road onto Kingston Road.<br>There is built development on the existing site. In order to ensure that future development does not increase the risk of flooding, the built footprint of new development of the site should not exceed that of the existing building and where possible should be reduced. |
| ST3/004 | 0.92 | 34-36 (OAST House) /Car park, Kingston Road | 180 | URBAN, PDL | 94 | 6 | 0 | 0 | Only the edge of the site is shown to flood. Access that is dry or Low hazard during the 1% AEP event including climate change allowance is achievable north west along Kingston Road and then east along London Road. |
| ST3/012 | 0.59 | Staines Telephone Exchange, Fairfield Avenue | 180 | URBAN, PDL | 0 | 80 | 20 | 0 | Site at Low and Moderate hazard. Access that is dry or at low hazard rating during the 1% AEP event including climate change allowance is achievable along Fairfield Avenue and onto London Road.<br>There is built development on the existing site. In order to ensure that future development does not increase the risk of flooding, the built footprint of new development of the site should not exceed that of the existing building and where possible should be reduced. |
| ST3/014 | 1.25 | Birch House/London Road, Fairfield Avenue | 400 | URBAN, PDL | 34 | 66 | 0 | 0 | Edge of site at Low hazard. Access that is dry or at low hazard rating during the 1% AEP event including climate change allowance is achievable along London Road. |
| Sites wholly in Flood Zone 3, with access at low hazard | | | | | | | | | |
| AT1/012 | 0.47 | Ashford Community Centre, Woodthorpe Road | 32 | GB, PDL | 0 | 4 | 95 | 1 | Site at Moderate hazard, northern edge adjacent to River Ash at Significant hazard. Access at Low hazard during the 1% AEP event including climate change is achievable south along Woodthorpe Road.<br>There is built development on the existing site. In order to ensure that future development does not increase the risk of flooding, the built footprint of new development of the site should not exceed that of the existing building and where possible should be reduced. |
| Sites in Flood Zone 3, with pedestrian access at low hazard | | | | | | | | | |
| ST1/037 | 1.26 | Thameside House, South Street | 140 | URBAN, PDL | 75 | 20 | 5 | 0 | Risk on site varies, high in south west quarter, low in the remaining area. Vehicular access is at Moderate and Significant hazard. Pedestrian access shown to be available at Low hazard beneath railway line, through to George Street and Kingston Road.<br>Further consultation with Emergency Planning and the Environment Agency is required to determine safety of occupants.<br>The south western part of the site is at risk of flooding during the design flood event (1% AEP including climate change). In this area, order to ensure that future development does not increase the risk of flooding to the surrounding areas, the built footprint of the new development should not exceed that of the existing building and where possible should be reduced. |
| ST4/009 | 5.13 | The Elmsleigh Centre and adjoining land, South Street | 850 | PDL, URBAN | 25 | 9 | 66 | 0 | Site is at Significant hazard. Vehicular access route has Moderate and Significant hazard during 1% AEP incl. CC. Pedestrian access shown to be available at Low hazard beneath railway line, through to George Street and Kingston Road.<br>Further consultation with Emergency Planning and the Environment Agency is required to determine safety of occupants.<br>In order to ensure that future development does not increase the risk of flooding to the surrounding areas, the built footprint of the new development should not exceed that of the existing building and where possible should be reduced. |
| Sites primarily in Flood Zone 1 and 2 with no access that is dry or low hazard | | | | | | | | | |
| SH1/010 | 0.11 | Shepperton Library, High Street | 10 | URBAN, PDL | 100 | 0 | 0 | 0 | The site is not at risk of fluvial floodplain, however access routes to the site are at Significant hazard rating during 1% AEP event including climate change.<br>Consultation with Emergency Planners and the Environment Agency will be required to discuss the safety of occupants, and not place an unacceptable additional burden on the emergency services. |
| SH1/015 | 0.31 | Shepperton Youth Centre, Laleham Road | 25 | URBAN, PDL | 0 | 100 | 0 | 0 | The site and access routes are at Moderate - Significant hazard rating during 1% AEP event including climate change.<br>Consultation with Emergency Planners will be required to discuss the safety of occupants, and not place an unacceptable additional burden on the emergency services.<br>There is built development on the existing site. In order to ensure that future development does not increase the risk of flooding, the built footprint of new development of the site should not exceed that of the existing building and where possible should be reduced. |
| SH2/003 | 0.17 | Shepperton Delivery Office, 47, High Street | 10 | URBAN, PDL | 100 | 0 | 0 | 0 | The site is not at risk of fluvial flooding, however access routes to the site are at Significant hazard rating during 1% AEP event including climate change.<br>Consultation with Emergency Planners will be required to discuss the safety of occupants, and not place an unacceptable additional burden on the emergency services. |
| ST4/004 | 0.88 | 96-104, Church Street | 100 | URBAN, PDL | 29 | 71 | 0 | 0 | The site is at Low – Moderate hazard. Access to the site is at Moderate - Significant hazard during 1% AEP event including climate change.<br>Consultation with Emergency Planners will be required to discuss the safety of occupants, and not place an unacceptable additional burden on the emergency services. |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | There is built development on the existing site. In order to ensure that future development does not increase the risk of flooding, the built footprint of new development of the site should not exceed that of the existing building and where possible should be reduced. |
| ST4/019 | 0.24 | Debenhams site, 35-45, High Street | 150 | URBAN, PDL | 95 | 5 | 0 | 0 | The site is not at risk of fluvial flooding, however access routes to the site are at Moderate - Significant hazard rating during 1% AEP event including climate change.<br>As a number of sites are being identified for potential redevelopment in Staines town centre, a wider plan for access to and from the town should be implemented as part of the ongoing Staines Development Framework and associated masterplanning and Infrastructure Delivery Plans. This will need to be developed in close consultation with Emergency Planning to ensure the safety of occupants, and not place an unacceptable additional burden on the emergency services. Such an access route will also be available for existing properties within the Staines area and will therefore improve the flood risk management measures for the area. |
| ST4/023 | 2.29 | Two Rivers Retail Park Terrace, Mustard Mill Road | 750 | URBAN, PDL | 80 | 20 | 0 | 0. | The site is not at risk of fluvial flooding, however access routes to the site are at Moderate hazard rating during 1% AEP event including climate change.<br>As a number of sites are being identified for potential redevelopment in Staines town centre, a wider plan for access to and from the town should be implemented as part of the ongoing Staines Development Framework and associated masterplanning and Infrastructure Delivery Plans. This will need to be developed in close consultation with Emergency Planning to ensure the safety of occupants, and not place an unacceptable additional burden on the emergency services. Such an access route will also be available for existing properties within the Staines area and will therefore improve the flood risk management measures for the area. |
| ST4/024 | 0.24 | Frankie & Benny's/Travelodge, Two Rivers, Hale Street | 55 | URBAN, PDL | 2 | 98 | 0 | 0 | The site is not at risk of fluvial flooding, however access routes to the site are at Moderate hazard rating during 1% AEP event including climate change.<br>As a number of sites are being identified for potential redevelopment in Staines town centre, a wider plan for access to and from the town should be implemented as part of the ongoing Staines Development Framework and associated masterplanning and Infrastructure Delivery Plans. This will need to be developed in close consultation with Emergency Planning to ensure the safety of occupants, and not place an unacceptable additional burden on the emergency services. Such an access route will also be available for existing properties within the Staines area and will therefore improve the flood risk management measures for the area. |
| ST4/025 | 0.92 | Land at Coppermill Road, Coppermill Road | 15 | GB, GF | 92 | 8 | 0 | 0 | The site itself it not shown to flood from the River Colne during the 0.1% AEP flood event, however the local area and access is at risk of flooding.<br>Consultation with Emergency Planners will be required to discuss the safety of occupants, and not place an unacceptable additional burden on the emergency services |
| ST4/028 | 0.11 | William Hill/Vodafone, 91, High Street | 14 | URBAN, PDL | 75 | 25 | 0 | 0 | The edge of the site is at Low hazard and the access routes are at Moderate- Significant hazard during the 1% AEP event including climate change.<br>As a number of sites are being identified for potential redevelopment in Staines town centre, a wider plan for access to and from the town should be implemented as part of the ongoing Staines Development Framework and associated masterplanning and Infrastructure Delivery Plans. This will need to be developed in close consultation with Emergency Planning to ensure the safety of occupants, and not place an unacceptable additional burden on the emergency services. Such an access route will also be available for existing properties within the Staines area and will therefore improve the flood risk management measures for the area. |
| Sites in Flood Zone 3, with no access that is dry or low hazard | | | | | | | | | |
| ST1/028 | 0.15 | Leacroft Centre, Leacroft | 17 | URBAN, PDL | 0 | 16 | 84 | 0 | The site is at Low to Moderate hazard, and access routes are at Moderate - Significant hazard rating during 1% AEP event including climate change.<br>Consultation with Emergency Planners will be required to discuss the safety of occupants, and not place an unacceptable additional burden on the emergency services.<br>There is built development on the existing site. In order to ensure that future development does not increase the risk of flooding, the built footprint of new development of the site should not exceed that of the existing building and where possible should be reduced. |
| ST4/010 | 0.25 | Riverside Surface Carpark, Thames Street | 35 | URBAN, PDL | 0 | 0 | 100 | 0 | The site is at Significant hazard rating. Any future development will need to demonstrate no loss in floodplain storage during the 1% AEP event including climate change event. As the existing site is a car park, this will either require buildings to be floodable or raised with floodplain storage beneath. This is unlikely to be considered acceptable for More Vulnerable development.<br>The additional requirement to deliver safe development on the remainder of the site, is providing safe access (dry or Low hazard) for occupants to an area outside the floodplain during the design flood event (1% AEP) including an allowance for climate change. The mapping for the River Thames indicates there is currently no access dry of low hazard route available during the 1% AEP including 35% climate change allowance. In order to cross the railway line and leave the floodplain, parts of the route along the A308 are defined as Significant hazard.<br>As a number of sites are being identified for potential redevelopment in Staines town centre, a wider plan for access to and from the town should be implemented as part of the ongoing masterplan development and associated infrastructure delivery plans. This will need to be developed in close consultation with Emergency Planning to ensure the safety of occupants, and not place an unacceptable additional burden on the emergency services. |
| ST4/026 | 0.25 | Communications House, South Street | 120 | URBAN, PDL | 0 | 16 | 84 | 0 | The site and access routes are at Moderate to Significant hazard rating during the 1% AEP event including climate change.<br>The built footprint of the new development should not exceed that of the existing building and where possible should be reduced.<br>The key requirement to deliver safe development on the remainder of the site, is providing safe access (dry or Low hazard) for occupants to an area outside the floodplain during the design flood event (1% AEP) including an allowance for climate change. The mapping for the River Thames indicates there is currently no access dry of low hazard route available during the 1% AEP including 35% climate change allowance. In order to cross the railway line and leave the floodplain, parts of the route along the A308 are defined as Significant hazard.<br>As a number of sites are being identified for potential redevelopment in Staines town centre, a wider plan for access to and from the town should be implemented as part of the ongoing masterplan development and associated infrastructure delivery plans. This will need to be developed in close consultation with Emergency Planning to ensure the safety of occupants, and not place an unacceptable additional burden on the emergency services. |
| Sites partially within Flood Zone 3b | | | | | | | | | |
| ST4/002 | 0.9 | Car Park, Hanover House & Sea Cadet Building, Bridge Street | 158 | URBAN, PDL | 1 | 1 | 51 | 47 | Development is not permitted in areas of Flood Zone 3b Functional Floodplain. This part of the site should be retained as floodplain and steps taken to restore the land to provide a more natural edge of the River Thames.<br>The key requirement to deliver safe development on the remainder of the site, is providing safe access (dry or Low hazard) for occupants to an area outside the floodplain during the design flood event (1% AEP) including an allowance for climate change. The mapping for the River Thames indicates there is currently no access dry of low hazard route available during the 1% AEP including 35% climate change allowance. In order to cross the railway line and leave the floodplain, parts of the route along the A308 are defined as Significant hazard.<br>As a number of sites are being identified for potential redevelopment in Staines town centre, a wider plan for access to and from the town should be implemented as part of the ongoing masterplan development and associated infrastructure delivery plans. This will need to be developed in close consultation with Emergency Planning to ensure the safety of occupants, and not place an unacceptable additional burden on the emergency services.<br>The built footprint of the new development should not exceed that of the existing building and where possible should be reduced. |
| ST4/011 | 0.36 | Thames Lodge, Thames Street | 40 | URBAN, PDL | 0 | 5 | 72 | 23 | Development is not permitted in areas of Flood Zone 3b Functional Floodplain. This part of the site should be retained as floodplain and steps taken to restore the land to provide a more natural edge of the River Thames.<br>The key requirement to deliver safe development on the remainder of the site, is providing safe access (that is dry or at low hazard) for occupants to an area outside the floodplain during the design flood event (1% AEP) including an allowance for climate change. The modelling for the River Thames indicates there is currently no dry or low hazard access route available during the 1% AEP including 35% climate change allowance. In order to cross the railway line and leave the floodplain, parts of the route are defined as Significant hazard ('Danger for Most').<br>As a number of sites are being identified for potential redevelopment in Staines town centre, a wider plan for access to and from the town should be implemented as part of the ongoing development of Staines masterplan and associated infrastructure delivery plans. This will need to be developed in close consultation with Emergency Planning to ensure the safety of occupants, and not place an unacceptable additional burden on the emergency services. Such an access route will also be available for existing properties within the Staines area and will therefore improve the flood risk management measures for the area. |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | The built footprint of the new development should not exceed that of the existing building and where possible should be reduced. |
| ST1/029 | 0.47 | Surrey CC Buildings, Burges Way | 30 | URBAN, PDL | 0 | 6 | 34 | 60 | Redevelopment that will increase the vulnerability classification of the development and/or the number of occupants on the site is not permitted. It is recommended that this site should be safeguarded for flood risk management purposes. |
| ST1/030 | 0.66 | Fairways Day Centre, Knowle Green | 30 | URBAN, PDL | 0 | 2 | 14 | 84 | Redevelopment that will increase the vulnerability classification of the development and/or the number of occupants on the site is not permitted. It is recommended that this site should be safeguarded for flood risk management purposes. |

3.3.2 Four sites have significant proportions of their area within the 3.3% AEP (1 in 30 year) modelled flood extent. New development should not be permitted within this flood extent (Flood Zone 3b). Redevelopment of existing buildings may be permitted, but only where the vulnerability of the development is not increased (and where possible reduced) and the number of occupants does not increase. This will significantly limit the number of units that can be delivered on these sites:

- ST4/002 Car Park, Hanover House and Sea Cadet Building, Bridge Street, TW18 4TG
- ST4/011 Thames Lodge, Thames Street
- ST1/030 Fairways Day Centre, Knowle Green, TW18 1AJ
- ST1/029 Surrey CC Buildings, Burges Way, TW18

3.3.3 Following review of the draft Level 2 SFRA, Spelthorne BC have removed ST1/030 and ST1/029 from their site allocations.

3.3.4 For all sites within Staines, a wider plan for access must be implemented as part of the ongoing Staines Development Framework and associated masterplanning and Infrastructure Delivery Plans. This will need to be developed in consultation with Emergency Planning teams and the Environment Agency to ensure the safety of occupants, and not place an unacceptable additional burden on the emergency services. Phasing of the sites over the local plan period should take into account when this provision of improved access can be delivered.

3.3.5 There are also isolated sites where access that is dry or at Low hazard is not available. Further consultation with Emergency Planners and the Environment Agency is required to discuss the safety of occupants, and not place an unacceptable additional burden on the emergency services.

- SH1/015 Shepperton Youth Centre, Laleham Road, TW17 8EJ
- ST1/028 Leacroft Centre, Leacroft
- SH1/010 Shepperton Library, High Street
- SH1/015 Shepperton Youth Centre, Laleham Road
- SH2/003 Shepperton Delivery Office, 47, High Street
- ST4/004 96-104, Church Street
- ST4/025 Land at Coppermill Road, Coppermill Road

3.3.6 The following sites are located entirely within the design flood extent (1% AEP including climate change), and currently used for non-residential ‘Less Vulnerable’ uses. For these sites, it will not be possible to provide level-for-level and volume-for-volume floodplain compensation storage *within* the development sites for any increase in building footprint. As a result, the built footprint of the new development of the site should not exceed that of the existing development. This may limit the number of units that can be delivered on the sites. Alternatively, some of the proposed development units could be designed to enable the free flow and storage of floodwater at ground level, with development located at higher levels, subject to further discissions with the Environment Agency. This may be achieved through the provision of undercroft open space with residential development at first floor level and above. However, it must be demonstrated that this area will be available for flood storage and this would need to be communicated to future occupants. Voids are not an acceptable method of floodplain compensation and will not be appropriate here.

- ST1/031 Thameside Arts Centre, Wyatt Road, TW18 2AY
- ST3/012 Staines Telephone Exchange, Fairfield Avenue, TW18 4AB
- AT1/012 Ashford Community Centre, Woodthorpe Road
- ST1/037 Thameside House, South Street
- ST4/009 The Elmsleigh Centre and adjoining land, South Street
- SH1/015 Shepperton Youth Centre, Laleham Road, TW17 8EJ
- ST4/004 96-104, Church Street

- ST1/028 Leacroft Centre, Leacroft
- ST4/010 Riverside Surface Carpark, Thames Street, TW18 4UD
- ST4/026 Communications House, South Street
- ST4/002 Car Park, Hanover House and Sea Cadet Building, Bridge Street, TW18 4TG
- ST4/011 Thames Lodge, Thames Street

3.3.7 Of these, ST4/010 (Riverside Surface Carpark, Thames Street, TW18 4UD) and ST4/002 (Car Park, Hanover House and Sea Cadet Building, Bridge Street, TW18 4TG) currently do not have existing buildings within the sites. In order for future development not to impact on the ability of the floodplain to store water, this would require buildings to be floodable or raised with floodplain storage beneath. This is unlikely to be considered acceptable for More Vulnerable development.

# Appendix A Borough-Wide Mapping

## A.1 River Thames Mapping



## A.2 Thames Tributaries Mapping



## A.3 River Ash Mapping



## A.4 River Colne Mapping

# Appendix B Sites Assessments