

Local Plan Part2

Addendum to the

Strategic Flood Risk Assessment and

Sequential Test

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HILLINGDON
LONDON

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2. Introduction

2.1. Background

Flooding of commercial and residential areas has significant economic and social impacts. It is therefore essential that new or existing sites are planned in a manner that fully considers flood risk, avoiding it wherever possible.

The Hillingdon Local Plan: Part 1: Strategic Policies was adopted in November 2012 and is the key strategic planning document for Hillingdon. This was informed on flooding issues by the Strategic Flood Risk Assessment (SFRA) published in 2008, which collated information that was held on all sources of flooding and brought it in to one document as evidence. Part 1 sets out a long-term spatial vision and objectives for the Borough, what is planned to happen, where and how it will be achieved. Hillingdon is now moving to the next stage in the planning process – to identify actual sites and provide a framework of development management policies to ensure sustainable growth in the borough.

2.2. Local Plan Part 2

The Development Management Policies Document forms part of Hillingdon's Local Plan Part 2. Its purpose is to provide detailed policies that will form the basis of the Council's decisions on individual planning applications. The plan has been developed over a period of time and through a series of consultation events.

2.3. Site Selection

Planning for the future requires a clear understanding of what sites are needed and where they will be located. The Plan has been subjected to a number of stages to develop a site selection process.

The list of opportunities has been narrowed down to those in Appendix A. Each of these sites has been assessed against the Flood Zone information held by the Environment Agency. These sites are composed of residential and mixed use sites, employment and industrial sites.

2.4. Purpose of this Report

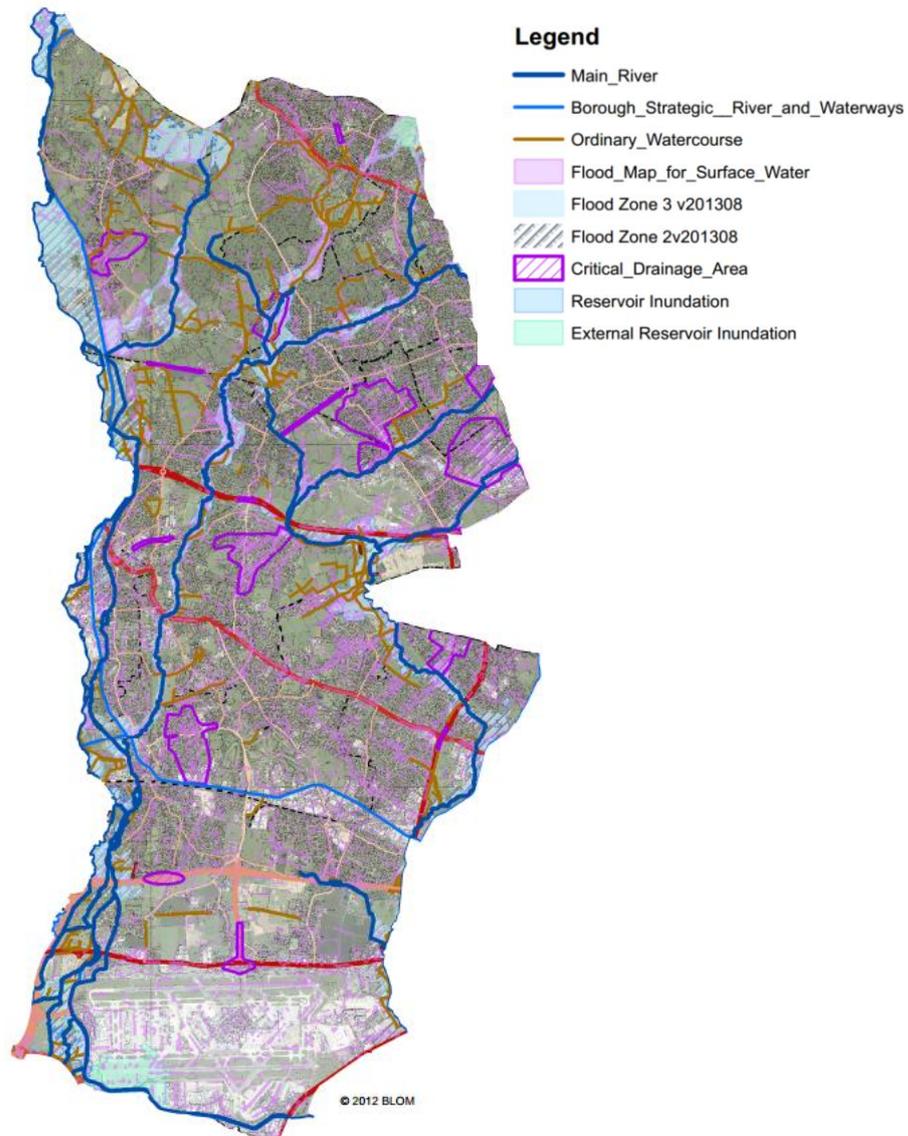
The purpose of this report is to provide an update to the SFRA produced in 2008. This will provide the current evidence on flood risk for the proposed Submission version of the Local Plan Part 2, particularly the Site Allocations document. It sets out the current policy context in assessing flood risk and how these sites relate to flood risk areas. It informs the sustainability appraisal so that flood risk is fully taken into account. This document assesses the need for and applies the Sequential Test in determining the land use allocations in accordance with the National Planning Policy Framework (NPPF). The vulnerability of land uses is considered and the Exception Test applied where required. It also identifies the need for site specific flood risk assessments, and includes recommendations for the management of flood risk at sites at a strategic level to reduce flood risk.

3. Evidence

3.1. Strategic Flood Risk Assessment (SFRA) 2008

Flood Risk information is continually changing and therefore requests to the data holders should be made to ensure the best available data is used to inform any flood risk assessments.

From the point the SFRA was produced, a number of the borough wide maps were considered to be out of date very quickly and not useful on a site specific basis. The information which is marked out of date should not be used in the production of this study. An illustration of the key areas of flood risk in the borough is shown on Map 1.



Map 1: Hillingdon Borough Illustration of Key Flood Risks

Appendix A details the review of the evidence available to inform this document, the maps and information, their status, and the source. All the evidence collected has been used to review the flood risk issues to the sites proposed.

Information was obtained from the Environment Agency through two sources; a data request Reference NET/041608/JH 3rd April 2014; and a data sharing portal for Local Authorities called 'Geostore'. All of the information available to Local Authorities via Geo Store indicated in the tables above can be found by the public on the Environment Agency website¹ within the Flood Map.

3.2. Fluvial Flood Risk Modelling

The Flood Map is used initially to indicate areas for planning purposes where further assessment on flood risk may be required. The Flood Map combines detailed local data from modelling and mapping studies with information from a national model of England and Wales. The Flood Map which is available to the public on the Environment Agency website shows Flood Zone 2 and 3a. Further information and explanation on these definitions is found in Section 3.

In a number of cases the Environment Agency has developed more detailed modelling to help understand flood risk. So in order to assess the fluvial flood risk to the sites in more detail, all modelling within the Borough was requested from the Environment Agency, Reference NET/041608/JH. The following Table shows the GIS layers provided as a result of this request:

Table 1: Modelling information provided by the Environment Agency 9th May 2014

| Watercourse | Date | Modelled Extents | Flood Zone |
|-------------|------------|---|--|
| River Crane | April 2008 | 1000 yr defended, 100 +CC defended, 20 yr defended | Flood Zone 2 Flood Zone 3a Flood Zone 3b |
| Upper Colne | Dec 2010 | 1000 yr defended, 100 +CC defended, 20 yr defended | Flood Zone 2 Flood Zone 3a Flood Zone 3b |
| Lower Colne | April 2012 | 1000 yr defended, 1000 yr undefended 100 +CC defended, 20 yr defended | Flood Zone 2 Flood Zone 3a Flood Zone 3b |

¹ www.environment-agency.gov.uk/floodrisk

| | | | |
|------------|------------|---|--|
| River Pinn | April 2008 | 1000 yr defended, 100 +CC defended, 20 yr defended | Flood Zone 2 Flood Zone 3a Flood Zone 3b |
|------------|------------|---|--|

Some parts of the borough are not covered by more detailed modelling and the Flood Zones information represents the best available data. However, none of the sites in the Proposed Submission version of the Site Allocations document (hereafter referred to as the Site Allocations document) are within these areas.

3.2.1. Flood Zone 3b

The modelling listed in Table 1 above is more recent and therefore uses the most up to date techniques. The establishment of Flood Zone as part of the Strategic Flood Risk Assessment in 2007 is therefore considered out of date and disregarded. The 1 in 20 year extents provided within each of the above models should be used as the starting point for the definition of Flood Zone 3b but not as the definitive extent.

4. Flood Risk Guidance

4.1. Sequential Test

The requirement to undertake flood risk and sequential test assessments of spatial planning policy are set out in the NPPF. This states that:

The aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding. The Strategic Flood Risk Assessment will provide the basis for applying this test. A sequential approach should be used in areas known to be at risk from any form of flooding.

Planning Practice Guidance released March 2014 further clarifies the role of the Sequential Test:

The overall aim should be to steer new development to Flood Zone 1. Where there are no reasonably available sites in Flood Zone 1, local planning authorities allocating land in local plans or determining planning applications for development at any particular location should take into account the flood risk vulnerability of land uses (see table 2) and consider reasonably available sites in Flood Zone 2, applying the Exception Test if required (see table 3). Only where there are no reasonably available sites in Flood Zones 1 or 2 should the suitability of sites in Flood Zone 3 be considered, taking into account the flood risk vulnerability of land uses and applying the Exception Test if required.

The Council is therefore keen to ensure that all proposals give sufficient weight to the flood risk. Avoiding potential flooding is done by locating sites in areas with lower probability, by applying the Sequential Test.

4.2. Flood Zone Definitions

To avoid the areas at risk of flooding requires an understanding and mapping of them. Table 1 in the Planning Practice Guidance on Flood Risk uses 4 flood zones to delineate areas with probability of flooding which are defined as follows:

Table 2: Planning Practice Guidance on Flood Risk - Table 1 Flood Zones

| Flood Zone | Definition |
|--|---|
| Zone 1 Low Probability | Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3) |
| Zone 2 Medium Probability | 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. (Land shown in light blue on the Flood Map) |
| Zone 3a High Probability | Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map) |
| 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 Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map) |

4.3. Appropriate Uses

The definitions above relate to Table 2 of the Planning Practice Guidance which defines the appropriateness of different uses:

Table 3: Planning Practice Guidance on Flood Risk - Table 2 Flood risk Vulnerability Classification

| | |
|--------------------------|--|
| Essential Infrastructure | <ul style="list-style-type: none"> ▪ Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. ▪ Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. ▪ Wind turbines. |
| Highly Vulnerable | <ul style="list-style-type: none"> ▪ Police stations, ambulance stations and fire stations and command centres and telecommunications installations required to be operational during flooding. ▪ Emergency dispersal points. ▪ Basement dwellings. ▪ Caravans, mobile homes and park homes intended for permanent residential use³. ▪ Installations requiring hazardous substances consent⁴. (Where there is a |

| | |
|-------------------------------------|--|
| | <p>demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as “essential infrastructure”⁵.</p> |
| <p>More Vulnerable</p> | <ul style="list-style-type: none"> ▪ Hospitals. ▪ Residential institutions such as residential care homes, children’s homes, social services homes, prisons and hostels. ▪ Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. ▪ Non–residential uses for health services, nurseries and educational establishments. ▪ Landfill and sites used for waste management facilities for hazardous wastes. ▪ Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan. |
| <p>Less Vulnerable</p> | <ul style="list-style-type: none"> ▪ Police, ambulance and fire stations which are not required to be operational during flooding. ▪ Buildings used for shops, financial, professional and other services, restaurants and cafes, hot food takeaways, offices, general industry, storage and distribution, non–residential institutions not included in “more vulnerable”, and assembly and leisure. ▪ Land and buildings used for agriculture and forestry. ▪ Waste treatment (except landfill and hazardous waste facilities). ▪ Minerals working and processing (except for sand and gravel working). ▪ Water treatment works which do not need to remain operational during times of flood. ▪ Sewage treatment works (if adequate measures to control pollution and manage sewage during flooding events are in place). |
| <p>Water-compatible Development</p> | <ul style="list-style-type: none"> ▪ Flood control infrastructure. ▪ Water transmission infrastructure and pumping stations. ▪ Sewage transmission infrastructure and pumping stations. ▪ Sand and gravel working. ▪ Docks, marinas and wharves. ▪ Navigation facilities. |

| | |
|--|---|
| | <ul style="list-style-type: none"> ▪ Ministry of Defence defence installations. ▪ Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. ▪ Water-based recreation (excluding sleeping accommodation). ▪ Lifeguard and coastguard stations. ▪ Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. ▪ Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan. |
|--|---|

4.4. Flood Zone 3b

Flood Zone 3b is defined as the areas where water has to flow or be stored in a time of flood. The definition for 3b was updated in March 2010 due to an inappropriate understanding of the definition provided in the Planning Policy Statement 25 document. The definitions were broadly the same, however many consultants focused on an objective assessment based on the 1:20 year flood levels. This ignored the policy directive to use this only as a starting point in which to consider areas 'where water had to flow or be stored in times of flood'. As a consequence many areas defined as 3b incorporated commercial, residential and industrial uses. The March 2010 update clarified that this was not a suitable approach but many Strategic Flood Risk Assessments were already completed, including Hillingdon's.

This Sequential Test will therefore consider the updated definition when completing the assessment. Each site will have a commentary that explains the likely flood probability with regards to the new definition of flood zone 3b and make appropriate conclusions and recommendations.

4.5. Exception Test

Flooding provides just one of a range of environmental, social and economic considerations for decision makers. It should not be seen as the overriding factor determining the location of development. A development may 'tick' a number of other sustainability objectives but not flood risk. These other factors need to be considered alongside the flood risk to ensure appropriate weight is given to both arguments.

The Exception Test is an additional test to ensure the vulnerability of development is considered in the context of the flood risk but also the wide benefits of the development. It

allows decision makers to evenly weight the sustainability arguments for a development against the negatives of a flood risk problem.

The table below sets out when the Exception Test should be applied:

Table 4: Planning Practice Guidance on Flood Risk - Table 3 Flood Risk Vulnerability and Flood Zone 'Compatibility'

| Flood Risk | Essential Infrastructure | Water Compatible | Highly Vulnerable | More Vulnerable | Less Vulnerable |
|------------|--|------------------|-------------------|-----------------|-----------------|
| Zone 1 | ✓ | ✓ | ✓ | ✓ | ✓ |
| Zone 2 | ✓ | ✓ | ? | ✓ | ✓ |
| Zone 3a | ? | ✓ | x | ? | ✓ |
| Zone 3b | ? | ✓ | x | x | x |
| ✓ | Development is appropriate once Sequential Test is passed | | | | |
| ? | Exception Test needs to be applied | | | | |
| x | Development is not appropriate regardless of Sequential Test | | | | |

5. The Sequential Assessment

5.1. Methodology

The sites contained in the Site Allocations document have been assessed in relation to flood zones, as required by NPPF. The detail of this assessment is contained in Appendix B and C of report, which assess the sites Residential and mixed use's' and Employment and industrial uses respectively.

5.2. Residential and mixed use

5.2.1. Sites in Flood Zone 1

From a review of **Appendix A**, the majority of sites are within Flood Zone 1. That is the zone of the lowest probability from fluvial flooding and therefore these sites pass the Sequential Test. Where applicable, other sources of flood risk and considerations have also been indicated in the Appendices. Site specific assessments will be required to assess other types of flooding where they are identified. Where sites are over 1 hectare a site specific FRA will be required to demonstrate they do not increase flood risk elsewhere through surface water run-off. As sites in Flood Zone 1 pass the sequential test, they are not reviewed further in this document. Please note that when proposing development on these sites there may be other policy criteria to be aware of. For example some sites contain or are adjacent to Strategic Waterways; therefore Policy EM3 Blue Ribbon Policy would apply.

5.2.2. Residential and mixed use sites partly within the floodplain

There are 3 sites identified within **Appendix B** which are partly shown within Flood Zone 2 and 3a.

Table 5: Residential and mixed use sites identified partly within the floodplain

| Site Allocations and Designations Reference | Site Name |
|--|-------------------------------------|
| SA4 | Packet Boat House |
| SA23 | St Andrews Park |
| SA24 | Master Brewer and Hillingdon Circus |

Packet Boat House as a change of use application is not subject to the Sequential and Exception Tests. It is also clear that a large proportion of St Andrews Park and the Master Brewer and Hillingdon Circus sites are within Flood Zone 1. Therefore a sequential approach within the sites could be used to avoid areas at risk, and the built development permitted only in areas outside the floodplain. These sites therefore pass the Sequential Test. The flood risk to these sites is explored further within Chapter 6.

5.3. Employment and industrial

5.3.1. Sites in Flood Zone 1

From a review of Appendix C the majority of sites designated for employment and industrial uses are within Flood Zone 1. That is the Zone of the lowest probability from fluvial flooding and therefore these sites pass the Sequential Test. Where applicable, other sources of flood risk and considerations have also been indicated in the Appendix. Site specific assessments will be required to assess other types of flooding identified. Where sites are over 1 hectare a FRA will be required to demonstrate they do not increase flood risk elsewhere through surface water run-off. As these sites pass the sequential test they are not reviewed further in this document. However there are additional policy criteria to be aware of when developing these sites. Some sites contain or are adjacent to Strategic Waterways; therefore the Mayor's policy on the Blue Ribbon network would apply.

5.3.2. Employment and industrial sites partly within the floodplain

There are 6 sites identified within Appendix C partly shown in Flood Zone 2 and 3.

Table 6: Employment and industrial sites identified partly within the floodplain

| Site Allocations Reference | Allocation | Area Name | Site Name |
|-----------------------------------|---------------------------------------|---|-----------------------------------|
| Map B | Preferred Industrial Locations (PILs) | Hayes Industrial Area (Comprised of 8 sites) | Sub area Springfield Road |
| Map C | | | Sub area Bulls Bridge |
| Map D | | Uxbridge Industrial Estate. | |
| Map E | | Stonefield Way Industrial Estate. | |
| Map F | Industrial Business Park (IBP) | North Uxbridge Industrial Area. | Sub area North of Rockingham Road |

| | | | |
|--------------|--|------------------------|------|
| | | (Comprised of 2 sites) | West |
| Map K | Locally Significant Industrial Location (LSIL) | Packet Boat Lane | |

It is clear that a large proportion of the sites identified in Table 6 are affected by flooding. Therefore a sequential approach where built development is permitted only in areas of Flood Zone 1, cannot be used to avoid areas at risk. However, these sites represent long term allocations which have been carried forward from other planning policy documents. The following section sets out the policy background to employment land uses in Hillingdon.

5.3.3. The London Plan

The London Plan (2011) identifies Strategic Industrial Locations (SILs), which are identified as London's main reservoir of industrial land, comprising 40% of London's total supply. Two types of SIL are identified in the London Plan:

Preferred Industrial Locations, (PIL) which are suitable for general industrial, storage and distribution, waste management, recycling and some transport functions; and

Industrial Business Parks, (IBP), which are particularly suitable for activities that need better quality surroundings, including research and development, light industrial and some waste management.

The London Plan identifies 4 SILs in Hillingdon, which are referred to in the Site Allocations document. These are

Hayes Industrial Area: (PIL)

North Uxbridge Industrial Estate: (IBP)

Stonefield Way/Victoria Road :(PIL)

Uxbridge Industrial Estate: (PIL)

Policy 2.17 in the Local Plan states that boroughs should identify SILs on proposals maps and develop Local Policies based on clear and robust assessments of need to protect their function and to enhance their attractiveness and competitiveness for industrial type activities. Policy 4.4 provides more detailed criteria on the management of industrial land and premises.

5.3.4. Identified Industrial sites under the 1998 UDP

The Council's Unitary Development Plan Saved Policies document was adopted in 1998 and identifies a number of Industrial Business Parks (IBAs) across the borough. These are locally designated sites which are identified as being suitable for B1, B2 and B8 uses. Policy LE2 in the UDP states that the Local Planning Authority will not permit development of other uses on these sites, unless the relevant criteria can be satisfied. This policy is retained as

part of the Local Plan Part 2, until the Development Management Policies are adopted by the Council.

5.3.5. **The Local Plan**

The Local Plan Part 1 was adopted by the Council in November 2012 and sets a strategic framework of policies to guide future growth in the borough. The Part 1 document identifies the SILs listed in the London Plan and also a framework of proposed Locally Significant Industrial Sites (LSIS) and Locally Significant Employment Locations LSELS, which are to be borough forward as a replacement for the IBAs - i.e. designated employment land that is of borough-wide significance. These designations are based on a review of employment land carried out in 2009. The Part 1 document notes that the Council will update the employment land review in advance of the production of the Site Allocations document.

The Site Allocations and Development Management Policies documents identify a number of sites as either SILs or locally significant employment sites (LSIS or LSEL), based on the conclusions of an updated employment land study. Unlike the current UDP, sites do not share more than one designation (for example, a site is not designated as a SIL and LSIS) as each designation meets different policy requirements.

The proposed employment sites are already in employment use and in many cases designations are carried forward from previous plans (albeit that the name of the designation has been changed). It is also important to note that whilst designated sites will act as a focus for B1, B2 and B8 uses, they are not identified for a specific quantum of new development. Instead, policies in the Local Plan Part 2 seek to protect these sites, as existing employment areas, from other forms of development. Whilst a number of these sites are subject to limited flood risk it is not possible, appropriate or suitable to identify sequentially preferable alternatives.

5.4. **Gypsy and Traveller Sites**

5.4.1. **Sites in Flood Zone 1**

The existing Council owned site at Colne Park was previously identified within the SFRA 2008 as partly within the floodplain. However the more recent modelling obtained from the Environment Agency indicates the whole sites lies in Flood Zone 1. Although caravans, mobile homes and park homes intended for permanent residential uses are classed as 'Highly Vulnerable' use this allocation in Flood Zone 1 is appropriate according to Table 3 of the Planning Practice Guidance. No further review of the site is proposed.

5.5. **Conclusions of the Sequential Test**

All the residential and mixed use sites proposed are therefore considered sustainable allocations, in that either the Sequential Test is not applicable or that sufficient area exists to propose appropriate development within Flood Zone 1. For employment and industrial use sites, all have been previously allocated through the London Plan or the Local Plan Part 1. This Local Plan Part 2 simply clarifies those boundaries. However as required by the London Plan the flood risk to and from these sites will be reviewed so that local criteria to manage the flood risks on these sites can be recommended. The Gypsy and Traveller site at Colne

Park lies in Flood Zone 1 and therefore the proposed allocation is not subject to the Sequential or Exception Test and is considered appropriate.

6. Flood Zone Compatibility

6.1. Residential and mixed uses

According to the guidance set out in the NPPF where there are no reasonably available sites in Flood Zone 1 local planning authorities should take into account the flood risk vulnerability of uses.

As provided in Chapter 3.3 uses are given a 'vulnerability' classification in Planning Practice Guidance on Flood Risk - Table 2.

For the residential and mixed use sites, residential is classed as 'more vulnerable' uses and appropriate in Flood Zone 1 and 2 where the sequential test has been passed.

Of the 3 sites identified to be reviewed further, residential development 'a more vulnerable use' is only proposed in areas of Flood Zone 1 where it is considered appropriate development.

6.2. Employment and industrial uses

Office and employment uses are classed as 'less vulnerable' and are appropriate in Flood Zone 1, 2 and 3a once the sequential test has been passed.

For the employment and industrial uses, these are classed as 'less vulnerable' uses are considered as appropriate in Flood Zone 1, 2 or 3 once the sequential test has been passed.

6.3. Exception Test

The proposed allocations for these uses are appropriate, such as residential in Flood Zone 1 and industrial in Flood Zone 3 and no Exception Tests are required as shown in Table 4 (page 10) within this document.

7. Site Specific Flood Risk

The most up to date evidence has been used in this assessment, as detailed in Chapter 2 of this document. The assessment of 3b impacts will be made in relation to the new definition (starting point is considered the 20 year event) and commentary provided where appropriate.

This chapter provides further detail on the specific issues associated with the residential and employment sites that have been identified as being within the flood plain. Although each review in this section does not refer to all of the evidence collected, this is taken in to account in the more detailed assessment contained in Appendix B and C of this document.

Whilst this section has been prepared to inform local development criteria contained in the Local Plan Part 2 documents it does not meet the requirements of a site specific flood risk assessment, which will be required to cover all of the elements outlined in the Planning Practice Guidance.

7.1. Residential and mixed use sites

The following section makes specific recommendations in relation to the three sites that are identified in section 4.3 of this statement

7.1.1. Packet Boat House, Cowley

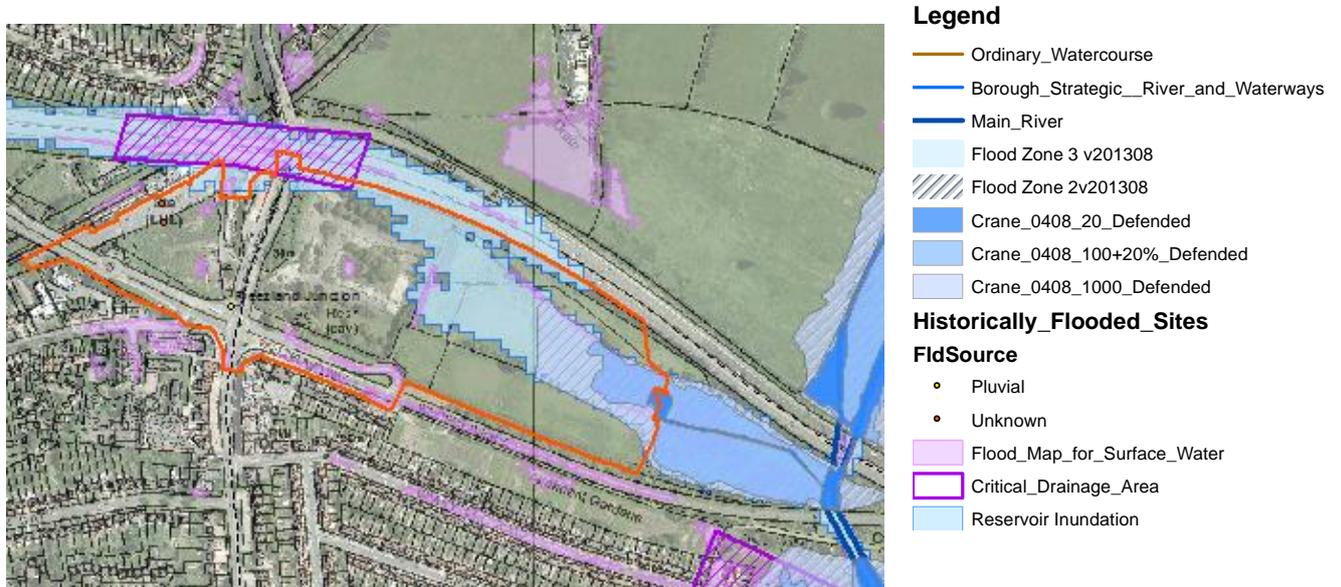
The site is at risk from the River Pinn and potentially the River Colne in more extreme events, therefore the flood risk to this site is complex. However the building on the site is already in existence. Under the NPPF there is no requirement for this site as a change of use to undergo a Sequential Test. There is an extant permission for this site for a change of use from offices to residential given in 2012. A site specific Flood Risk Assessment was undertaken for the proposed development which demonstrated that the site should lie in Flood Zone 1 and the site was safe.



Map 2: Flood risk identified on Packet Boat House, Cowley

7.1.2. **Former Master Brewer and Hillingdon Circus**

This site lies only partly within the floodplain, indicated in the model detail modelling by Flood Zone 2 (1 in 1000 year) and a much smaller area within Flood Zone 3a and 3b. The majority of the site lies in Flood Zone 1 and therefore residential development is an appropriate vulnerability use.



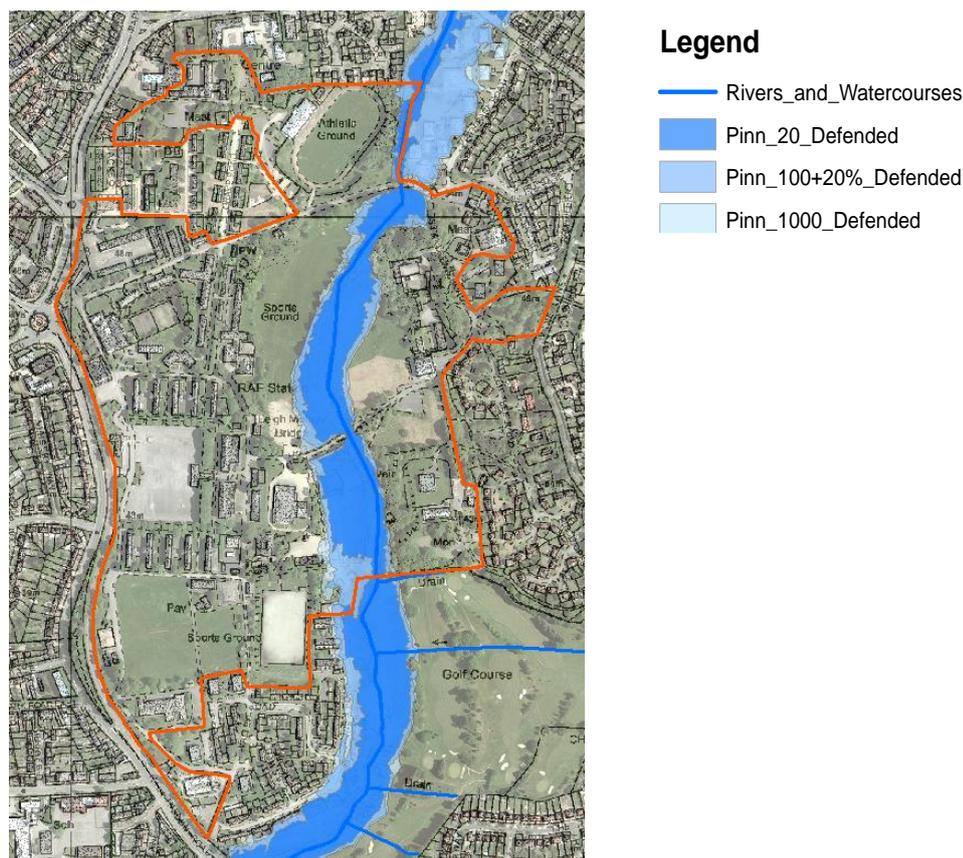
Map 3: Flood risk identified on Former Master Brewer and Hillingdon Circus

Any proposal within this site should provide a site specific flood risk assessment covering the area which should utilise more detailed modelling to establish the exact level of flood risk to the site. Those areas defined as floodplain should be retained for public open space. The key risks to the site can be seen in Map 3. It is apparent there are a variety of risks to the site all of which should be considered. As the site is located near two Critical Drainage Areas it is important that the sites development contributes towards the reduction in flood risk and the management of future flood risk of the wider area.

7.1.3. **St Andrew's Park (formerly RAF Uxbridge)**

This site lies only partly within the area defined as the 1000 year extent and therefore Flood Zone 2 and a much smaller area within Flood Zone 3a (100yr) and 3b (20yr). The majority of the site lies in Flood Zone 1 and therefore residential development is an appropriate vulnerability use. It is therefore recommended that any area within Flood Zones 3 and 2 are retained for public open space. There should be consideration of the importance of the location of the development adjacent to a Strategic Waterway and apply the principles within Policy EM3 Blue Ribbon Network.

There is an extant permission for the development of St Andrews Park. A site specific flood risk assessment was undertaken for this site. The proposals for the site include the provision of 14.2 ha of Open Space comprising of a District park around the River Pinn.



Map 4: Flood risk identified on St Andrews Park

7.2. Employment and industrial use sites

Table 3 from the NPPF shows that Industrial and Employment land sites are an appropriate use within Flood Zone 3a, 2 and 1 and the Exception Test is not required. However in order that appropriate policies can be considered and put in place at a local level to manage the flood risk, the flood risk on each of the sites partly within the floodplain is examined in more detail in this section.

7.2.1. Hayes Industrial Area - Springfield Road

A large part of the site lies within Flood Zone 2 indicated by the hatching. However it is clear that Flood Zone 3a and 3b remain within the channel. Although in comparing the extent of Flood Zone 2 and the more detailed modelling, Flood Zone 2 extends much further beyond the river.

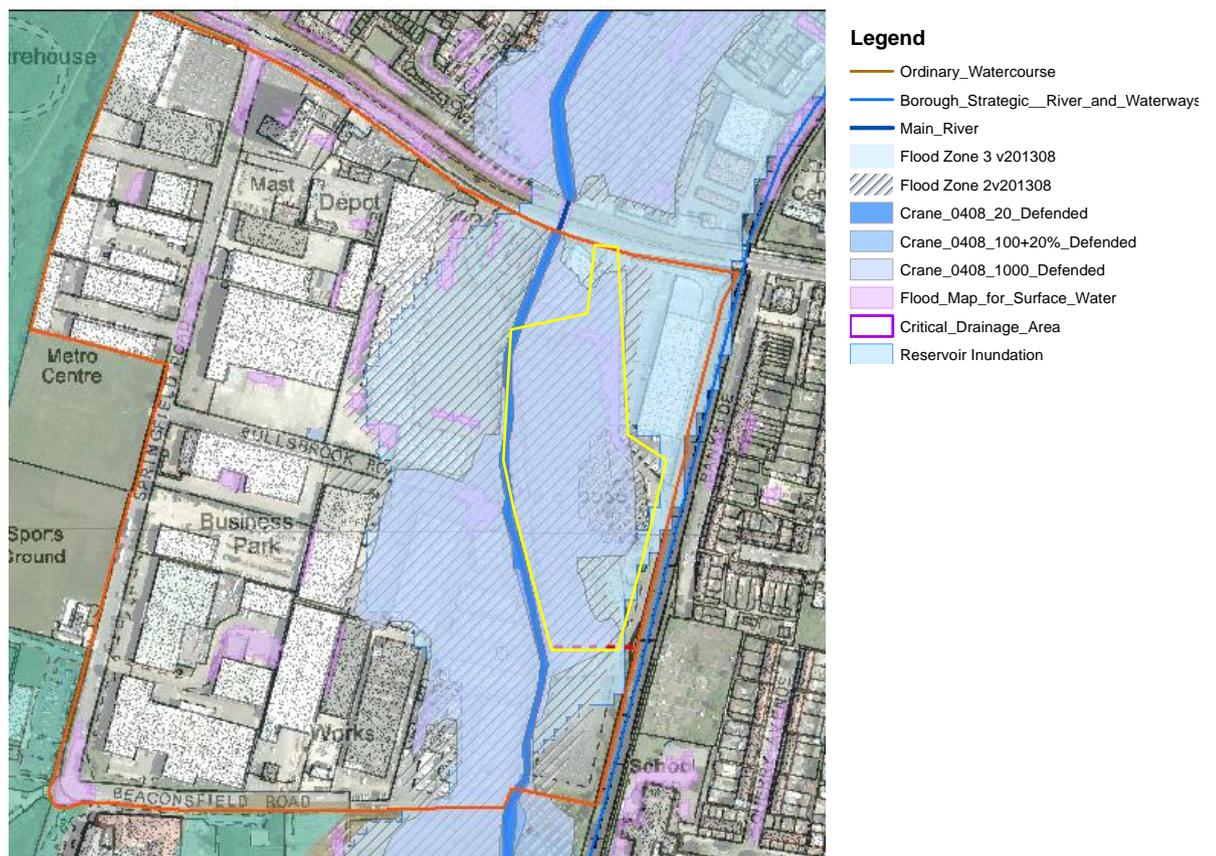
In recognition of the current risk to these sites, the Council would recommend all businesses in this area on the site creating a Flood plan, including warning and evacuation.

Any proposal within this site should provide a site specific flood risk assessment. This should maximise the space available for floodwater to reduce the flood risk across the rest of the site as well as proposing ways to ensure the development is safe. Even development not directly affected by fluvial flood risk must contribute towards the management of flood risk

within this area to ensure the sustainability of this location for employment and industrial uses. All developments in this area should contribute to offsite flood alleviation.

Surface water must be managed carefully and run off reduced to green field run off rates to reduce the flood risks in this area for the future. The culverted ordinary watercourse linking the Canal and River Crane shown by the dashed red line must be monitored and maintained.

The River Crane running through the site is designated a Strategic Waterway and therefore development must comply with the Blue Ribbon Network Policy EM3. It should also be noted that where landownership boundaries are adjacent to the River it is presumed that landownership extends to the centre of the river. Clear management and maintenance plans should be produced to ensure the functioning of these watercourses.



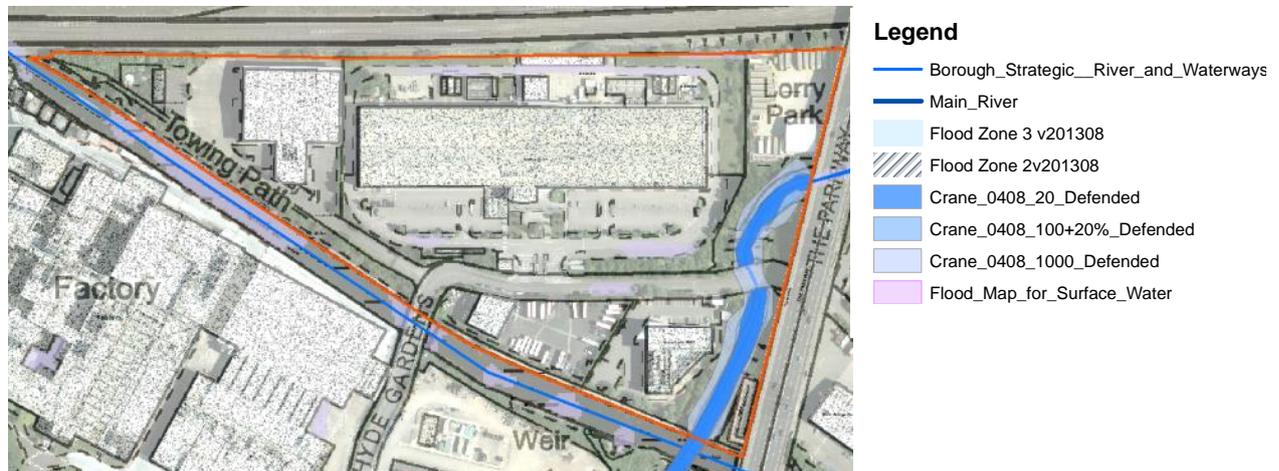
7.2.2. Map 5: Flood risk identified on Hayes Industrial Area - Springfield Road

There is an extant permission for part of the site 1-3 Uxbridge Road (highlighted yellow) for continuing industrial uses. This reduces the built footprint within the floodplain reducing local flood risk.

7.2.3. Hayes Industrial Area - Bulls Bridge

The majority of the site is Flood Zone 1, Flood Zone 2 and 3 are contained within the banks of the river, and the majority of the site lies within Flood Zone 1 and therefore proposals for the site would be safe. However as an industrial area significant opportunities exist to reduce

flood risk through the management of Surface Water and so any redevelopment of this site so surface water must be managed carefully and run off reduced to green field run off rates to reduce the flood risks in this area for the future. Sustainable drainage proposed should address the requirements of the Water Framework Directive to improve water quality in this area.



7.2.4. Map 6: Flood risk identified on Hayes Industrial Area - Bulls Bridge

The River Crane running through the site is designated a Strategic Waterway and therefore development must comply with the Blue Ribbon Network Policy EM3. It should also be noted that where landownership boundaries are adjacent to the River it is presumed that landownership extends to the centre of the river. Clear management and maintenance plans should be produced to ensure the functioning of these watercourses.

7.2.5. Uxbridge Industrial Estate - South of Trout Road

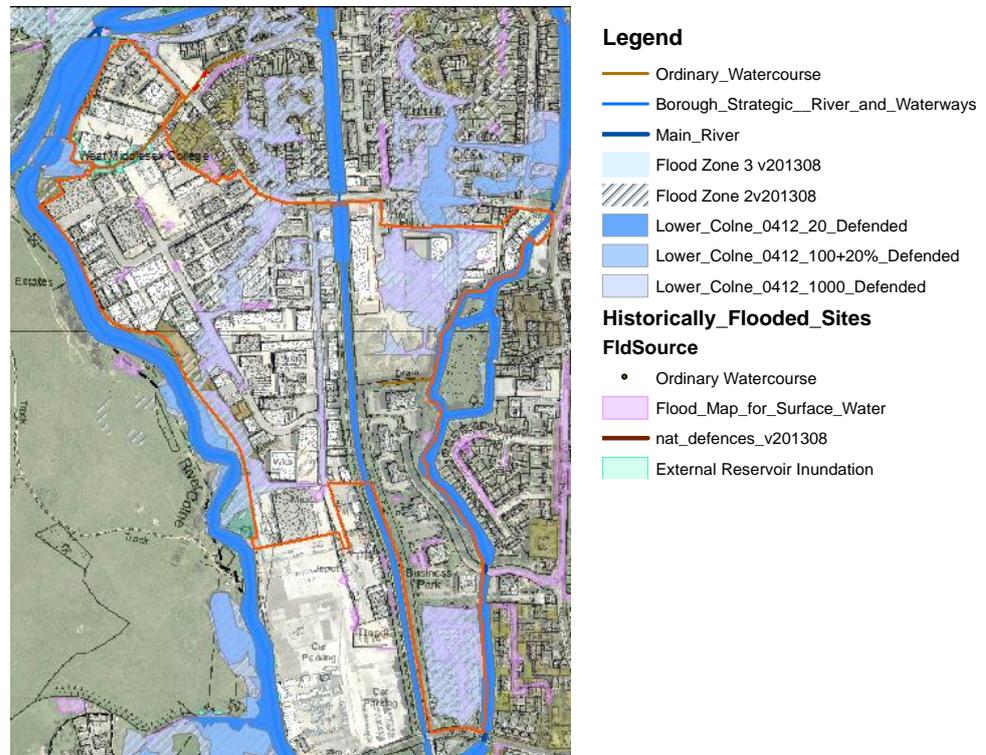
The fluvial flood risks remain generally within the banks of the River Colne and the Canal. A large part of the site lies within Flood Zone 2 indicated by the hatching. However it is clear that Flood Zone 3a and 3b remain within the channel. Although in comparing the extent of Flood Zone 2 and the more detailed modelling, Flood Zone 2 extends much further beyond the river.

In recognition of the current risk to these sites, the Council would recommend all businesses in this area on the site creating a Flood plan, including warning and evacuation.

Any proposal within this area should provide a site specific flood risk assessment. This should maximise the space available for floodwater to reduce the flood risk across the rest of the site as well as proposing ways to ensure the development is safe. Flood flow routes between the canal and the River Colne should be considered.

Even development not directly affected by fluvial flood risk must contribute towards the management of flood risk within this area to ensure the sustainability of this location for employment and industrial uses. All developments in this area must contribute to S106 for flood risk management.

Surface water must be managed carefully and run off reduced to green field run off rates to reduce the flood risks in this area for the future. The ordinary watercourse linking the Canal and River Colne must be monitored and maintained.



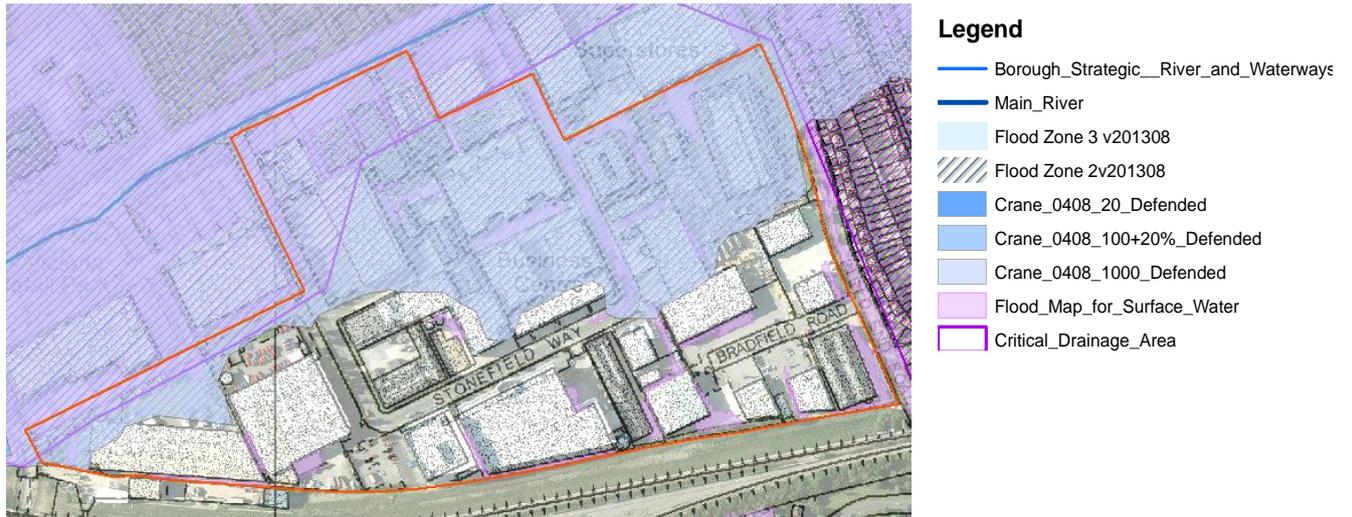
Map 7: Flood risk identified on Uxbridge Industrial Estate

The River Colne and the Grand Union Canal running through the site is designated a Strategic Waterway and therefore development must comply with the Blue Ribbon Network Policy EM3. It should also be noted that where landownership boundaries are adjacent to the River it is presumed that landownership extends to the centre of the river. Clear management and maintenance plans should be produced to ensure the functioning of these watercourses.

7.2.6. Stonefield Way Industrial Estate

A large part of the site lies within Flood Zone 2 indicated by the hatching. Flood Zone 3a and 3b remain within the Culverted main river. In recognition of the current risk to these sites, the Council would recommend all businesses in this area on the site creating a Flood plan, including warning and evacuation.

Any development proposal within this site should provide a site specific flood risk assessment. This should maximise the space available for floodwater to reduce the flood risk across the rest of the site as well as proposing ways to ensure the development is safe. Even development not directly affected by fluvial flood risk must contribute towards the management of flood risk within this area to ensure the sustainability of this location for employment an industrial uses. All developments in this area must contribute to S106 for flood risk management.



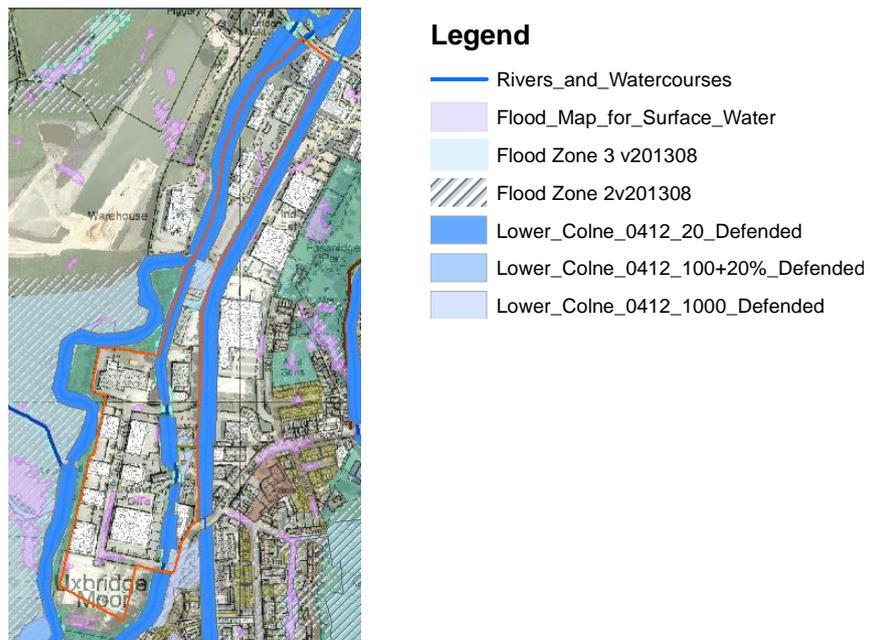
Map 8: Flood risk identified on Stonefield Way Industrial Estate

Surface water must be managed carefully and run off reduced to green field run off rates to reduce the flood risks in this area for the future.

7.2.7. North Uxbridge Industrial Area - North of Rockingham Road West

The fluvial flood risks remain generally within the banks of the River Colne and the Canal. Only a small part of the site lies within Flood Zone 2 indicated by the hatching. However it is clear that Flood Zone 3a and 3b remain within the channel.

In recognition of the current risk to these sites, the Council would recommend all businesses in this area on the site creating a Flood plan, including warning and evacuation.



7.2.8. Map 9: Flood risk identified on North Uxbridge Industrial Area - North of Rockingham Road West

Any proposal within this site should provide a site specific flood risk assessment. This should maximise the space available for floodwater to reduce the flood risk across the rest of the site as well as proposing ways to ensure the development is safe. Even development not directly affected by fluvial flood risk must contribute towards the management of flood risk within this area to ensure the sustainability of this location for employment and industrial uses. All developments in this area must contribute to S106 for flood risk management.

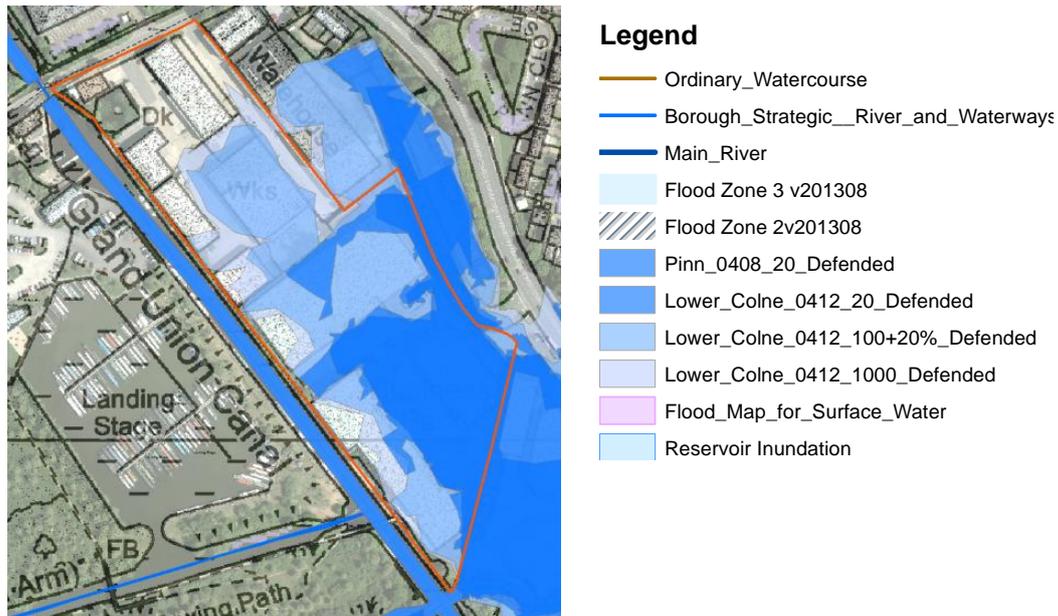
Surface water must also be managed carefully and run off reduced to green field run off rates to reduce the flood risk in this area for the future.

7.2.9. **Packet Boat Lane**

The majority of the site lies within a flood risk area from the River Pinn. The River flows under the Canal through a siphon. This does not flow quickly enough and water flows from the river into the industrial area. In recognition of the current risk to these sites, the Council would recommend all businesses in this area on the site creating a Flood plan, including warning and evacuation.

There are two models that have been undertaken which cover this area and which show slightly different extents of flooding. Both models indicate that a large part of the site is in the 20 yr extent. However a large part of the 20 year floodplain extent covers the built development of the site. That area within the built footprint clearly does not meet the criteria where water has to flow or be stored in times of flood, and therefore should not be classed as Flood Zone 3b. Any development in this area will have to be very careful to reduce the built footprint and manage flood flow routes appropriately.

As the site is adjacent to the Canal which is designated a strategic waterway in the Local Plan Part 1 the Policy EM6 Blue Ribbon applies. The area includes a small dock, with access onto the Canal and should be utilised as part of any redevelopment. Any development should aim to make the most of the location and promote enjoyment and access to the Canal. Access is currently through a footbridge over the siphon. This is also the end of the Celandine walk and a key north south route across the borough and a priority to improve.



Map 10: Flood Risk identified on Packet Boat Lane

Any proposal within this site should provide a site specific flood risk assessment. This should maximise the space available for floodwater to reduce the flood risk across the rest of the site as well as proposing ways to ensure the development is safe. Even development not directly affected by fluvial flood risk must contribute towards the management of flood risk within this area to ensure the sustainability of this location for employment and industrial uses.

A number of options are being considered by the Environment Agency to reduce the risks to this area including replacement of the siphon and creation of further space for water. Contribution through S106 for flood risk management will be expected for all developments put forward on this site.

Surface water must also be managed carefully and run off reduced to green field run off rates to reduce the flood risk in this area for the future.

8. Conclusions

The flood risk information held by the Council informing its planning decisions have been updated. This document informs the sustainability appraisal and shows in applying the NPPF Guidance that the Local Plan Part 2 Development Management Document is not promoting any sites with an unacceptable risk of flooding.

Any development proposals within each of the sites identified within Tables 5 and 6 of this document should consider the local development criteria recommended. This is important to ensure that the status quo is not just maintained but these developments contribute to the management of future flood risk.

These recommendations include the request for all individual applications within these sites to provide a Flood Risk Assessment. Primarily this will be to ensure that as the key risk for the Borough that surface water is managed appropriately and the sites contribute to the management of future flood risk and reduce the risk of flooding through ensuring water runoff sites is controlled to greenfield rates.

APPENDIX A

| SFRA 2008 | Status | Data | Source * |
|---|----------------|---|---|
| Figure 1 Hillingdon Map | Current | | |
| Figure 2 Main River | Still relevant | Main River | Environment Agency Geo Store |
| Figure 3 Historic Flooding Points and Flood Zones | Out of date | Flooding points | The Council |
| | | Flood Zones | Environment Agency Geo Store |
| Figure 4 Other sources of flood risk | Out of date | Ordinary Watercourses | The Council |
| | | Surface Water | Environment Agency Geo Store |
| | | Groundwater | Environment Agency Geo Store |
| | | Artificial Water bodies including Flood Storage Areas | The Council |
| | | Areas of High relief susceptible to overland flow | Environment Agency |
| | | Reservoir Flooding. | Environment Agency |
| | | Figure 5 NFCDD | Out of date |
| Figure 6 Flood Warning Area | Out of date | Flood warning Alert and Flood Warning Areas | Environment Agency Geo Store |
| Figure 7 Vulnerability Location Map | Out of date | Vulnerable institutions | The Council |
| Figure 8 Solid Geology Map | Still relevant | Solid Geology | Environment Agency Geo Store |
| Figure 9 Drift Geology Map | Still relevant | Drift Geology | Environment Agency Geo Store |
| Appendix A Data register | Out of date | Found in this section | |
| Appendix B Sewer Flooding Data | Out of date | Sewer Flooding Data | Thames Water and Affinity |
| Appendix C Sequential and Exception test | Out of date | Sequential and Exception Test | Section 4 and Section 7 |
| Appendix D Suds Tables | Out of date | SuD's Tables | Further Guidance will be developed by the SuD's Approval Body |
| Appendix E Coarse Assessment | Out of date | Found in Section 7 | |

* None of the above are reproduced in the SFRA to ensure that anyone undertaking a Flood Risk Assessment obtains the best available data.

| SWMP Part 1 2013 | Status | SFRA 2014 | Source |
|--|----------------|---------------------------------|---------------------------------|
| Figure 1-2 Drain London Sub Regional partnership | Out of date | | Not reproduced in the SFRA 2014 |
| Figure 1-4 Land uses within the London Borough | Still relevant | | Not reproduced in the SFRA 2014 |
| Figure 1-5 Main Watercourses | Still relevant | Main River | Environment Agency Geo Store |
| Figure 1-6 Lidar Representation | Still relevant | Not reproduced in the SFRA 2014 | Environment Agency |
| Figure 1-7 Proposed Strategic Flood Risk Management Boards | Still relevant | Not reproduced in the SFRA 2014 | Drain London |
| Table 2-1 Data Sources and use | Out of date | See Section 2 Evidence | All |
| Table 3-2 Records of Surface Water Flooding | Out of date | See Historic flooding points | The Council |
| Figure 3-1 Model coverage | Out of date | See Section 2 Evidence | Environment Agency GIS layers |
| Table 3-3 Watercourses in the borough | Out of date | See above table | The Council |
| Table 3-4 Records of Groundwater Flooding | Out of date | Not reproduced in the SFRA 2012 | The Council |
| Table 3-5 Number of Thames Water Sewer records | Out of date | Not reproduced in the SFRA 2013 | Thames Water |
| Figure 3-3 Critical Drainage Area Locations | Still relevant | Not reproduced in the SFRA 2014 | The Council |
| Figure 3-4 Hazard to people FD2321/TR1 | Still relevant | Not reproduced in the SFRA 2014 | DEFRA |

APPENDIX B Residential and mixed use Site Allocations review

| Site Allocations Reference | Name | Location | Area | Size | Proposed use | Extant Permission | Previously Developed | Flood Zone | Sequential Test needed | Other Flood risks | Policy Criteria for development |
|----------------------------|---|---|--------------|----------------|---------------------------------------|-------------------|----------------------|------------|------------------------|----------------------------------|---|
| SA1 | Enterprise House, | 133 Blyth Road, Hayes, Hillingdon, UB3 1DD | Hayes | 0.3 ha | Mixed use office and residential | None | Yes | 1 | No | | |
| SA2 | The Old Vinyl factory and Gatefold Building | Blyth Road, Hayes, Hillingdon, UB3 1DD | Hayes | 4.32ha / 0.7ha | Residential led mixed use development | Yes | Yes | 1 | No | | Site over 1 ha Flood Risk Assessment required to address drainage. |
| SA3 | Eastern end of Blyth Road | Blyth Road/Station Road | Hayes | 0.3ha/ 0.8 ha | Residential led mixed use development | Yes | Yes | 1 | No | | |
| SA4 | Packet Boat House | Packet Boat Lane | Cowley | 0.35 ha | Residential | Yes | Yes | 3a, 2 & 1 | No | | Site Specific Flood Risk Assessment demonstrates site not at risk. |
| SA5 | Olympic House, 1a Grove Lane | Junction of Field Heath Road and Grove Road | Hillingdon | 1.7 ha | Residential | Yes | Yes | 1 | No | Ordinary Watercourse | Site over 1 ha Flood Risk Assessment required to address drainage. |
| SA6 | Intial House | 150 Field End Road | Eastcote | 0.3ha | Residential | Yes | Yes | 1 | No | | |
| SA7 | Land at the rear 119 - 137 Charville Lane | 119 - 137 Charville Lane | Hayes | 0.48 ha | Residential | Yes | No | 1 | No | | |
| SA9 | NATS Porters Way | Porter's Way | West Drayton | 12.59ha | Mixed use residential | Yes | Yes | 1 | No | | Site over 1 ha Flood Risk Assessment required to address drainage. |
| SA10 | Land south of railway including Nestle | Nestle Avenue /Station Road | Hayes | 12 ha | Mixed use (incl residential) | None | Yes | 1 | No | | Site over 1 ha Flood Risk Assessment required to address drainage. |
| SA11 | Western Core | Station Road (numerous) | Hayes | 0.68 ha | Retail scheme with residential above | Yes | Yes | 1 | No | | |
| SA12 | 269 - 285 Field End Road | Junction of Field End Road/Sunningdale Avenue | Eastcote | 0.365 ha | Residential | None | Yes | 1 | No | | |
| SA13 | Charles Wilson Engineers | 1362 - 1366 Uxbridge Road | Hayes | 0.85ha | Residential | None | Yes | 1 | No | | |
| SA14 | Royal Quay | Summerhouse Lane | Harefield | 0.49 ha | Residential | Yes | Yes | 1 | No | Foul water sewer capacity issues | Sufficient developable area outside FZ2 and 3. Flood Zone areas to be retained for open space. Site over 1 ha Flood Risk Assessment required to address drainage. |

| Site Allocations Reference | Name | Location | Area | Size | Proposed use | Extant Permission | Previously Developed | Flood Zone | Sequential Test needed | Other Flood risks | Policy Criteria for development |
|----------------------------|--|--|---------------|----------------|---------------------------------------|-------------------|----------------------|---------------|------------------------|----------------------------|--|
| SA24 | Former Master Brewer and Hillingdon Circus | Western Avenue/ Long Lane, Long Lane/ Freezeland Way | Hillingdon | 9.65ha / 3.2ha | Mixed use | None | No | 3b, 3b, 2 & 1 | No | | Sufficient developable area in FZ1. Floodplain areas to be retained for open space. Site over 1 ha Flood Risk Assessment required to address drainage. |
| SA15 | Royal Mail Sorting Office | Junction of Park Way and East way | Ruislip manor | 0.27 ha | Residential | None | Yes | 1 | No | | |
| SA16 | West End Road | north of Wingfield Way adjacent to West End Road | South Ruislip | 1.0 ha | Residential | None | Yes | 1 | No | | Site over 1 ha Flood Risk Assessment required to address drainage. |
| SA17 | Braintree Road | Victoria Road | South Ruislip | 7.1 ha | Residential (and mixed use) | None | Yes | 1 | No | Critical Drainage Area | Site over 1 ha Flood Risk Assessment required to address drainage. |
| SA18 | Chailey Industrial Estate | Site A and Site B Pump Lane | Hayes | 2.6 ha | Mixed use development | None | Yes | 1 | No | Surface water ponding | Site over 1 ha Flood Risk Assessment required to address drainage. |
| SA19 | Silverdale Road/Western View | north of Western View south of Silverdale Road | Hayes | 2.3 ha | Mixed use residential | None | Yes | 1 | No | Blue Ribbon Policy | Site over 1 ha Flood Risk Assessment required to address drainage. |
| SA20 | Long Lane | 297-299 Long Lane, | Hillingdon | 0.39 ha | Residential led mixed use development | None | Yes | 1 | No | | |
| SA21 | High Street, Baker's Row (WH Smith) | 148-154 High Street/25-30 Bakers Row | Uxbridge | 0.3 ha | Mixed use residential, office, retail | None | Yes | 1 | No | Some surface water ponding | |
| SA22 | Martin Close | 2-24 Martin's Close, south of RAF Uxbridge | Uxbridge | 0.37ha | Residential | None | Yes | 1 | No | | |
| SA22 | Valley Road | Valley Road south of RAF Uxbridge | Uxbridge | 0.86ha | Residential | None | Yes | 1 | No | | |
| SA23 | St Andrew's Park (formerly RAF Uxbridge) | Hillingdon Road | Uxbridge | 46.6ha | Residential led mixed use development | Yes | Yes | 3b, 3a 2 & 1 | No | | Sufficient developable area in FZ1. Floodplain areas to be retained for open space. Site over 1 ha Flood Risk Assessment required to address drainage. |

| Site Allocations Reference | Name | Location | Area | Size | Proposed use | Extant Permission | Previously Developed | Flood Zone | Sequential Test needed | Other Flood risks | Policy Criteria for development |
|----------------------------|--------------------------------|---|---------------|-----------|---------------------------------------|-------------------|----------------------|------------|------------------------|----------------------------|--|
| SA25 | Cape Boards | Iver Lane | Cowley | 13 ha | Residential led mixed use development | None | Yes | 1 | No | | Site over 1 ha Flood Risk Assessment required to address drainage. Site adjacent to Canal and River Colne . A Strategic waterway. Local Plan Blue Ribbon Network Policy EM3 applies. |
| SA26 | Former Vehicle Testing Station | Cygnets Way | Hayes | 1.68 ha | Residential | None | Yes | 1 | No | Some surface water ponding | Site over 1 ha Flood Risk Assessment required to address drainage. |
| SA27 | Hayes Bridge Uxbridge Road | adjacent to Tollgate Drive/Delamere Drive | Hayes | 0.8ha | Residential led mixed use development | None | Yes | 1 | No | | Site adjacent to Canal a Strategic waterway. Local Plan Blue Ribbon Network Policy EM3 applies. |
| SA28 | Padcroft Works | Tavistock Road | Yiewsley | 1.53 ha | Residential | Yes | Yes | 1 | No | Surface water ponding | Site over 1 ha Flood Risk Assessment required to address drainage. |
| SA29 | Trout Road | Rainbow Industrial Estate, Trout Road | Yiewsley | 2.7 ha | Mixed use development | None | Yes | 1 | No | Surface water ponding | Site over 1 ha Flood Risk Assessment required to address drainage. |
| SA30 | Uxbridge Health Centre | Chippendale Way | Uxbridge | 0.1650 ha | Residential led mixed use development | None | Yes | 1 | No | Surface water ponding | |
| SA31 | Odyssey Business Park (part) | Cavendish Avenue and Bourne Court | South Ruislip | 1.28 ha | Residential | None | Yes | 1 | No | | Site not over 1 ha however localised flooding issues in the area therefore Flood Risk Assessment required to manage surface water to greenfield run off rates. |
| SA32 | St Andrews park | Annington Homes Site | Uxbridge | 3.22ha | Residential | | Yes | 1 | No | | Site over 1 ha therefore Flood Risk Assessment required to manage surface water. |