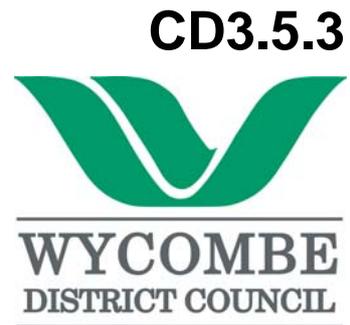


**Delivery and Site Allocations Plan
June 2012
Supporting Document**



**CD3.5.3
Flood Risk Sequential Test Background
Paper**



WYCOMBE
DISTRICT COUNCIL

Revised Flood Risk Sequential Test Background Paper

August 2012

Delivery and Site Allocations Plan

Contents

1. Introduction.....	3
2. National Planning Policy Framework Context	3
3. The Wycombe Development Framework	4
4. Summary of Strategic Flood Risk Assessment.....	6
5. Sequential test.....	8
Question 1) Which sites are in Flood Zone 1 Low Probability of Flood Risk?.....	9
Question 2) Which sites are in Zone 2 Medium Probability of Flood Risk?.....	9
Question 3) Which sites are in Zone 3a High Probability of Flood Risk?	10
Question 4) Could the development proposals for allocated sites in zones 2 and 3a alternatively be located in a Flood Zone of lower probability of Flood Risk?	10
Question 5) Are the proposed uses for sites within Zone 2 compatible with the Flood Risk Vulnerability Classification?	10
Question 6) Are the proposed uses for sites within Zone 3a compatible with the Flood Risk Vulnerability Classification?	11
Question 7) Which sites are in Zone 3b Functional Floodplain?	11
Question 8) Can the development proposals in Zone 3b be redirected to Zone 2 Medium probability or Zone 3a High Probability?	11
Question 9) Are the proposed uses for the site within Zone 3b Functional Floodplain compatible with the Flood Risk Vulnerability Classification?.....	11

1.0 Introduction

- 1.1 This revised report sets out the sequential test relating to proposed site allocations as included in the Delivery and Site Allocations Plan (DSA) (June 2012). The DSA focuses mainly on the town centres of High Wycombe, Marlow and Princes Risborough and as such this assessment also focuses on those areas.
- 1.2 The methodology is based upon discussions with the Environment Agency, the guidance and requirements set out in the National Planning Policy Framework and the Development and Flood Risk - Practice Guide.
- 1.3 The DSA identifies 21 sites, of which 16 are located within Flood risk zone 1, 5 sites are within Flood Zone 2; one site contains a small amount of land that is both zone 3a or 3b.
- 1.4 The sequential test is based upon the Strategic Flood Risk Assessment undertaken for the Council by JE Jacobs which has been agreed by the Environment Agency and contains information on the following:
 - Historical River Flooding
 - Fluvial Flood Risk
 - Localised Flood Risk
 - Groundwater Flooding
 - Impacts of Climate Change upon flood risk
 - Residual Risk of Flooding

2.0 National Planning Policy Framework Context

- 2.1 The National Planning Policy Framework (NPPF) sets out the national policy in relation to development and flood risk. In producing development plans consideration needs to be given to the present and future levels of flood risk. A risk based approach to allocating land is required whereby the aim is to identify land for development that is in lowest possible flood risk zone.
- 2.2 The NPPF requires that when allocating land for development the sequential test should be applied to demonstrate that there are no reasonably available sites with a lower probability of flooding for the type of development or land use proposed.
- 2.3 In applying the sequential test preference should be given to land that is located in Flood Zone 1, and if no reasonably available alternative is available for the type of development proposed, only then should consideration be given to locating

2.4 Pages 2 to 12 of the NPPF Technical Guidance set out more detail on the sequential test, exceptions test, flood zones and vulnerability of different land uses.

3.0 The Wycombe Development Framework (WDF)

3.1 In 2008 Wycombe District Council adopted the Core Strategy, the first part of the WDF, which sets housing targets for the District, but does not make any allocations for development. Originally the DSA was intended to allocate sites for housing and employment to meet the requirements of both the Core Strategy and the South East Plan – the regional spatial strategy for the South East of England. The scope of the document has been reduced to reflect the intention of the government to abolish regional spatial strategies and allow local authorities to set locally derived housing targets. The Council intends to review the housing targets in the Core Strategy by 2015 and as a consequence the DSA now focuses on allocating sites in the town centres of High Wycombe, Marlow and Princes Risborough.

3.2 In assessing these three town centres, only Marlow has land that might be considered for development that is in zone 3a or 3b. If there were to be a proposal on land not allocated it would be dealt with by DSA policy DM16.

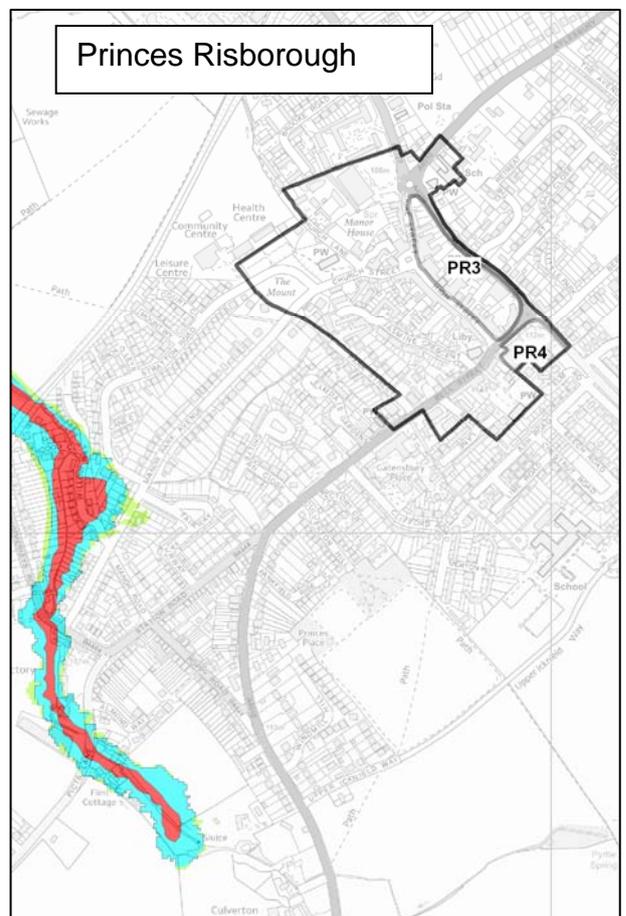
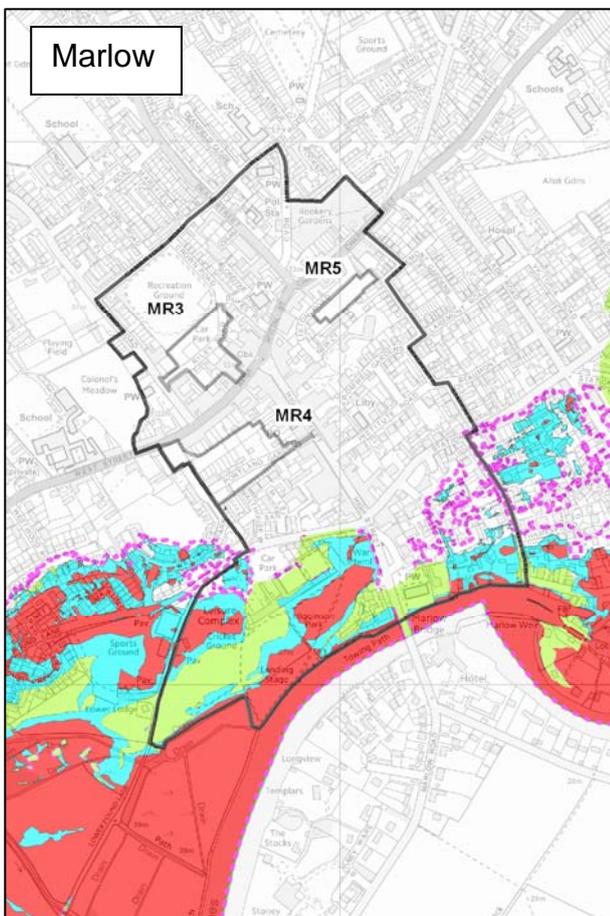
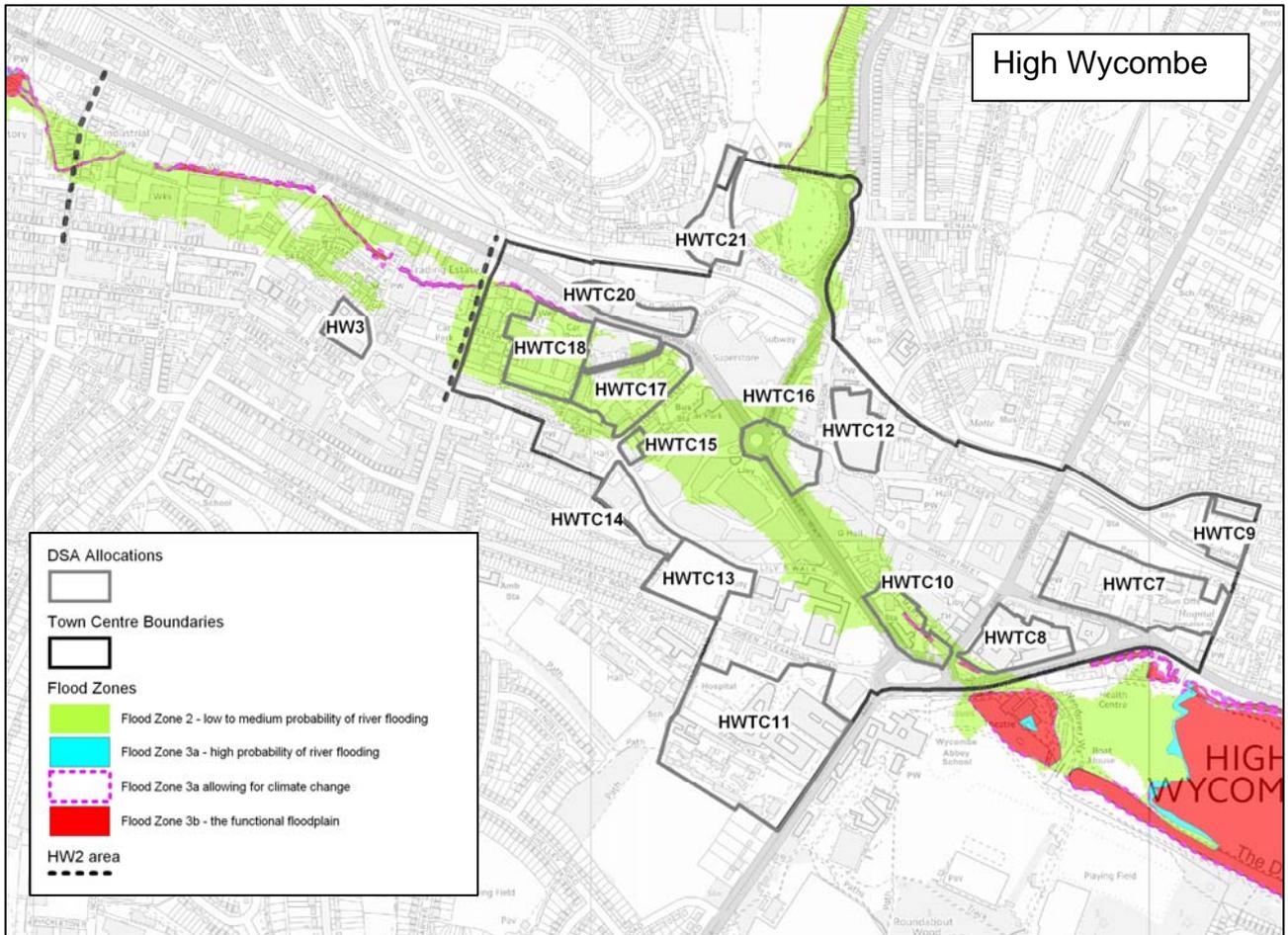
3.3 An additional sequential test will be required to support the review of the Core Strategy, which begins in 2013 to assess locally based housing needs.

3.4 The aim of allocating sites in these 3 town centres is to deliver regeneration and economic development, rather than being driven by housing targets. The allocations proposed are brownfield redevelopments or designations for uses which are currently in-situ. The main focus of the DSA is on High Wycombe Town Centre and implementation of the town centre masterplan.

3.5 This sequential assessment does not include scattered employment sites and as such any future proposals for their redevelopment will need to satisfy the sequential test where appropriate.

3.6 The scope of the DSA and proposed allocations are shown in figure 1, this also shows the extent of the flood zones as identified in the SFRA.

Figure 1 Extent of the DSA and Areas of Flood Risk



- 3.5 Table 1 sets out the coverage of flood risk zones in the three town centres, and shows that overall there is a relatively small area that is subject to a high risk of flooding.

Table 1 Areas subject to flood risk

High Wycombe	Area ha	%
High Wycombe Town Centre	74.23	
Flood Zone 1 - low probability of river flooding	55.10	74.23
Flood Zone 2 - low to medium probability of river flooding	18.98	25.57
Flood Zone 3a - high probability of river flooding	0.03	0.04
Flood Zone 3b - the functional floodplain	0.12	0.16

Marlow Town Centre	45.70	
Flood Zone 1 - low probability of river flooding	34.76	76.10
Flood Zone 2 - low to medium probability of river flooding	4.25	9.3
Flood Zone 3a - high probability of river flooding	3.61	7.9
Flood Zone 3b - the functional floodplain	3.08	6.7

Princes Risborough	16.7	
Flood Zone 1 - low probability of river flooding	16.7	100
Flood Zone 2 - low to medium probability of river flooding	0	0
Flood Zone 3a - high probability of river flooding	0	0
Flood Zone 3b - the functional floodplain	0	0

4.0 Summary of Strategic Flood Risk Assessment

- 4.1 A number of watercourses flow through Wycombe District. The principal watercourses include the River Thames, which runs along the District's entire southern boundary and the River Wye, which bisects the town of High Wycombe. Other, smaller, watercourses are the Hamble Brook, which flows into the Thames, the Hughenden Stream, which is a tributary of the Wye, and the Lyde, Bonny & Elm Brooks, which flow north off the Chiltern Hills into the Vale of Aylesbury.

Flood Risk

- 4.2 The SFRA has identified the probability of fluvial flood risk across the district as well as mapping other sources of flooding. The SFRA has used the flood zones produced by the Environment Agency and refined them through the use of hydraulic modelling to produce more accurate flood zones. The SFRA has also modelled the impacts of climate change on the flood zones where modelling is available to identify if the area at risk from flooding will increase as a result of climate change.
- 4.3 In terms of fluvial flooding the analysis of the data in the SFRA has identified that a relatively small area of the district is at risk of flooding (see Figure D of the SFRA).

Impacts of Climate Change

- 4.4 *NPPF Technical Guidance* advises that an SFRA also needs to include an assessment of the implications of climate change on the risk of flooding. Modelling work on both the Lower Thames and the River Wye has assessed the impact of a 20 % increase in river flows. The SFRA includes detailed modelling of the impact of climate change on the 1 in 100 year flood event (flood zone 3a) for the River Thames and the River Wye (see para.4.3) and shows an increase in the extent of the 1 in 100 year flood event in some locations.
- 4.5 The Sequential Test is based upon an application of the current flood risk areas, the climate change extents will need to be taken into account in the flood risk assessment and detailed design of any development sites falling in those areas.
- 4.6 In relation to other areas away from the Thames and the Wye where there is no detailed modelling, the EA has advised that as a conservative estimate Flood Zone 2 should be used as an indication of the extent of Flood Zone 3 in 100 years time.

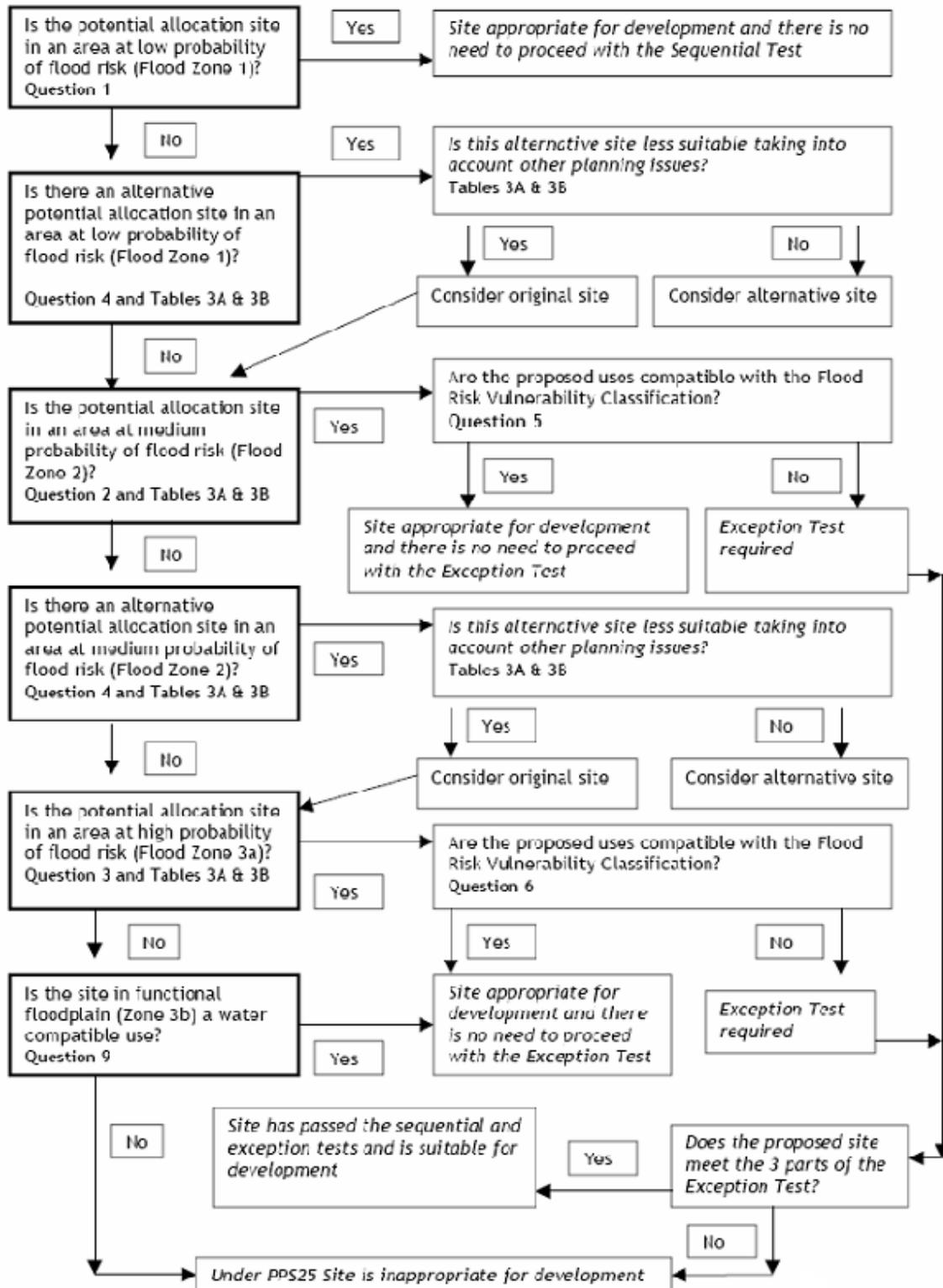
Other sources of flooding

- 4.7 The SFRA has also mapped other sources of flooding, such as ground water flooding (Appendix G SFRA), localised surface water flooding (Appendix A, SFRA), as well as historical flooding (Appendix, SFRA). The work to date has indicated that occurrences of flooding from these other sources have been relatively low.
- 4.8 It has not been possible at this stage to assess the levels of risk from these sources, as the data acquired to date for the SFRA is not detailed enough to enable a quantitative approach to risk from these sources, and no guidance is provided by either NPPF or the Development and Flood Risk Practice Guide , on how risk from these sources should be assessed.
- 4.9 As such they have not been dealt with in the same way as fluvial flood risk by this sequential assessment. As it is not possible to assess the level of risk presented by these other sources when Core Strategy is revised (work due to begin in 2013) then this will need to include an assessment of the risk from these other sources of flooding if the information is available as well as being included in more detailed work when site specific flood risk assessments are undertaken for sites at the planning application stage.

5.0 Sequential Test

5.1 The Development and Flood Risk Practice Guide sets out how the sequential test should be applied to allocating land; this approach has been further developed by Chelmsford and Reading Borough Councils and is set out in the flow chart below.

SEQUENTIAL TEST AND EXCEPTION TEST FLOWCHART



- 5.2 In order to identify levels of flood risk and compare different sites the flood risk data contained within the SFRA has been used.
- 5.3 In addition to following this methodology it was agreed with the Environment Agency that where sites overlapped more than one Flood Risk Zone, 20% of the site should be located within the higher risk zone for it to be considered as being at that level of risk. For example, if it was calculated that a site had 5% of the area in Flood Zone 3a, 10% in Flood Zone 2 and the remainder in Flood Zone 1- in terms of the sequential test it would be considered to be in Flood Zone 1.
- 5.4 It is important to note that flood risk zones are not mutually exclusive as they overlap. Any area that is in zone 3b is also zone 3a and zone 2, any land in zone 3a is also zone 2. Therefore in calculating the percentage of a site within any given flood risk zone this needs to be considered. E.g. a site that is 5% in zone 3b, 15% in zone 3a and 5% in zone 2 would be 20% zone 3a and 25% zone 2 and as such considered as being 3a for the purposes of this sequential test.
- 5.5 Sites that have been assessed using the 20% threshold will still require a Flood Risk Assessment to accompany the Planning Application. This would need to adopt a sequential approach within the site to ensure that any development taking place was directed to the parts of the site with a lower level of flood risk. The level of complexity of the document will be tailored to the risk associated with the site.

Question 1) is the proposed site in Flood Zone 1 – Low Probability of Flood Risk?

- 5.6 Sixteen sites are located wholly within flood zone 1
- HWTC7, HWTC8, HWTC9, HWTC11, HWTC12, HWTC13, HWTC14, HWTC16, HWTC20, HWTC21, HW3, MR3, MR4, MR5, PR3 and PR4**
- 5.7 HWTC8 also overlaps with a higher flood risk zone 2 (5% of site area) but as this represents lower than 20% it is dealt with as being in flood zone 1.

Question 2) which sites are in Zone 2 Medium Probability of flood risk?

- 5.8 Six sites in High Wycombe Town Centre have been identified as being within Flood Risk Zone 2, these are set out in the table below:

Table 2 Sites located within Flood Zone 2

Site	Area ha	FZ1		FZ2		FZ3	
		Area ha	%	Area ha	%	Area ha	%
HWTC10	2.13	1.17	55.1%	0.95	44.5%	0.01	0.5
HWTC15	0.18	0.08	44.5%	0.10	55.5%	0	0
HWTC16	1.44	0.74	51.7%	0.70	48.3%	0	0
HWTC17	1.8	0.21	11.7%	1.59	88.3%	0	0
HWTC18	1.97	0.15	7.8%	1.82	92.2%	0	0
HWTC19	0.75	0.55	73.7%	0.20	26.3%	0	0

In addition to these sites the area identified in Desborough for delivering open space and improvements to the River Wye corridor contains stretches of the River Wye which are flood zone 2. HWTC10 also contains a short stretch of the River Wye (Zones 3a and b) amounting to 0.5% of the site area, but as this represents lower than 20% it is dealt with as being in flood zone 2.

Question 3) which sites are in Zone 3a High Probability of flood risk?

No

Question 4) could the development proposals for allocated sites in zones 2 and 3a alternatively be located in a Flood Zone of lower probability of Flood Risk?

- 5.9 The 6 sites identified in zone 2 have been identified as allocations in order to meet Core Strategy and DSA objectives to support the economic role of the town centre, provide opportunities for new employment generating development, improve connectivity between the newer and traditional parts of the town centre and improve the town centre environment. There are no other sites that can achieve this either in a lower flood risk zone or that are available. As set out in para. 5.6 above 16 sites are proposed in zone 1 in High Wycombe Town Centre and no further sites have been promoted in the town centre.
- 5.10 In particular sites HWTC10 and HWTC16 are allocated as a result of potential proposals for the downgrading and potential removal of the abbey way flyover and as such it is not possible for the proposals to be located elsewhere. The same principle applies to the Desborough area in terms of the area identified for delivery of open space and improvements to the River Wye, in that developments elsewhere would not be able to deliver these objectives.
- 5.11 When sites that have a mix of flood risk zones come forward for development the sequential approach should be carried out within the site, development should be

Question 5) Are the proposed uses for sites within Zone 2 compatible with the Flood Risk Vulnerability Classification (reference Tables 2 & 3 Technical Guidance to the National Planning Policy Framework) i.e. are they essential infrastructure, water compatible, more vulnerable or less vulnerable classified uses?

- 5.12 The proposed sites identified in zone 2 in High Wycombe Town centre are for a mix of residential, business and retail uses, classified as “more” and “less” vulnerable uses both of which are compatible with zone 2. In the Desborough area no sites are allocated, but the focus of the policy approach is to deliver open space adjacent to the river enabled through mixed development of existing sites. The proposed uses are residential or employment depending on the site, both of which are acceptable uses in flood zone 2.

Question 6) Are the proposed uses for sites within Zone 3a compatible with the Flood Risk Vulnerability Classification (reference Tables 2 & 3 NPPF Technical Guidance) i.e. are they water compatible, or less vulnerable classified uses?

- 5.13 No sites are located within Flood Zone 3a

Question 7) which sites are in Zone 3b Functional Floodplain?

- 5.14 No sites are located within Flood Zone 3b

Question 8) Can the development proposals in Zone 3b be redirected to Zone 2 Medium probability or Zone 3a High Probability?

- 5.15 No sites are located within Flood Zone 3b

Question 9) Are the proposed uses for the site within Zone 3b Functional Floodplain compatible with the Flood Risk Vulnerability Classification (reference Tables 2 & 3 NPPF Technical Guidance) i.e. are they water compatible?

- 5.16 No sites are located within Flood Zone 3b