



Sequential Test
for the
Royal Borough of Kingston upon Thames
Core Strategy Pre-Submission
January 2011

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1. Introduction

- 1.1 This report provides the flood risk Sequential Test for the Core Strategy Pre-Submission Publication Version January 2011 for Royal Borough of Kingston upon Thames (RBK). The Core Strategy is a spatial document made up of strategic and development management policies. It sets out the strategy for the Borough for the next fifteen years, up to 2027 and forms part of the Borough's Local Development Framework (LDF). The Core Strategy contains strategic and development management policies on housing and local delivery strategies on housing and affordability for Area Guidance: Kingston Town Centre, Maldens and Coombe, South of the Borough and Surbiton.
- 1.2 The Core Strategy outlines the "indicative areas" for potential new housing and estimated total capacity. These are shown in the Core Strategy Pre-Submission, Figure 19 and table (pages 112 and 113) in policy CS10 Housing Delivery. This guidance does not equate to allocations but gives an indication of the expected housing delivery across the Borough. It is important to note that sites have been identified in the Strategic Housing Land Availability Assessment/Housing Capacity Study (SHLAA/HCS) process and this excludes any sites in Flood Risk Zone 3b.
- 1.3 It is the Core Strategy "indicative areas" that have been subjected to a Sequential Test in accordance with Planning Policy Statement 25: Development and Flood Risk (PPS25). This report indicates which flood risk zones these "indicative areas" fall within, applies the Sequential Test approach and provides mitigation measures.

2. Policy Background

Planning Policy Statement 25: Development and Flood Risk

- 2.1 PPS25 requires local authorities to prepare a Strategic Flood Risk Assessment (SFRA). The SFRA looks at all sources of flooding and takes the impact of climate change into consideration. It provides the basis for Sequential Test and Exception Test in development allocation and development management process. A Level 1 SFRA is a general flood risk non-site specific overview whilst a Level 2 SFRA is required for proposed allocations that fall within a flood affected area within the Borough and addresses each site. The SFRA therefore forms an important part of the LDF evidence base.
- 2.2 Where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, local planning authorities should consider whether there are opportunities in the preparation of Local Development Documents (LDD) to facilitate the relocation of development, including housing to more sustainable locations at less risk from flooding.

Planning Policy Statement 3: Housing

- 2.3 This sets out the Government's objectives for a flexible, responsive supply of land for housing which gives priority to using previously developed land for development. It points out that flood risk should be taken into account in determining the suitability of the land for development.

Sequential Test

2.4 The review of flood risk is referred to as the Sequential Test and delineates areas to flood zones. A sequential risk based approach to determining the suitability of land for development in flood risk areas should be applied at all levels of planning process. Local planning authorities allocating land in the LDD for development should apply the Sequential Test to demonstrate there are no reasonably available sites in areas of lower probability of flooding. PPS25 sets out the Sequential Test approach in *Annex D* and *Table D.1*. This approach should be used in areas known to be at risk of flooding and preference is given to locating new development in Flood Zone 1. If there are no reasonably available sites in Flood Zone 1, then the flood vulnerability (in accordance with PPS25 *Annex D*, *Table D.2* and *Table D.3*) of the proposed development can be taken into account in locating development to Flood Zone 2 and Flood Zone 3. Within each flood zone new development should be directed to sites of the lowest probability of flooding as indicated by SFRA.

Exception Test

2.5 Where it is not possible to allocate all proposed development, in accordance to the Sequential Test, then the Exception Test can be applied. PPS25 paras. D9 –D14 sets out the detail for the application of the Exception Test. The Exception Test is only appropriate for use when there are large areas of proposed development in Flood Zone 2 and 3 and the Sequential Test alone can't deliver acceptable sites. It therefore allows necessary development to occur which is essential for meeting wider sustainability objectives. In PPS25, Annex D, para. D.9 sets out the requirements for the Exception Test to be passed which are:

- a) It must demonstrate that it provides wider sustainability benefits to community that outweigh flood risk.
- b) Development should be on developable previously developed land or if it is not on previously developable land, that there are no reasonable alternative sites on developable previously developed land.
- c) A Flood Risk Assessment (FRA) must demonstrate that development is safe.

2.6 The Exception Test should be applied in line with Annex D, Table D.2 in PPS25.

3. Strategic Flood Risk Assessment

3.1 The Borough's SFRA¹ contains a Level 1 assessment of the Borough and a Level 2 assessment for the key proposal sites in Kingston Town Centre. The SFRA is a strategic document that provides an overview of all the different types of flooding in the Borough. It therefore provides the basis for the application of the PPS25 Sequential Test and a framework for planning decisions.

3.2 In the SFRA, flood maps have been established that are used to inform the application of the Sequential Test in accordance with Appendix D (TableD1) of PPS25. The Borough has been delineated into the PPS25 fluvial flood zones as summarised below:

- Zone 3b Functional Floodplain

¹ The Royal Borough of Kingston upon Thames Strategic Flood Risk Assessment can be found on the Council's Planning and flood risk web page - http://www.kingston.gov.uk/browse/environment/planning/flood_risk.htm

Land assessed as having a 1 in 20 or greater annual probability of flooding in any year (i.e. 5% AEP); and/or Areas susceptible to flooding within which “water has to flow or be stored in times of flood” (PPS25).

- Zone 3a High Probability
Land assessed as having a 1 in 100 or greater annual probability of flooding in any year (i.e. 1% AEP).
- Zone 2 Medium Probability
Land assessed as having between a 1 in 100 (i.e. 1% AEP) and 1 in 1000 (i.e. 0.1% AEP) annual probability of river flooding in any year.
- Zone 1 Low Probability
Land assessed as having a less than 1 in 1000 annual probability of river flooding in any year (i.e. 0.1% AEP).

4. Sources of Flooding

Fluvial Flood Risk

- 4.1 The Environment Agency has mapped areas subject to fluvial flood risk from the River Thames and its tributaries (see Figure 2). They cover most of Kingston Town Centre, land along the Thames, the Hogsmill Valley, the Bonesgate Stream through Surbiton and the Beverley Brook along the Borough’s eastern boundary. The risk of fluvial flooding to property within the wider Borough is relatively low. It is only properties which are located near the River Hogsmill (Surbiton Stream) and Beverley Brook that may experience flooding during a 1 in 100 design event. Most of the flood zones (those areas at risk of flooding from rivers in a 1 in 100 year and 1 in 1000 year design event) are open space.
- 4.2 Although the 1 in 100 year event is difficult to model, the SFRA highlights areas that have a potential risk of flooding within New Malden, Southborough & Hook and the Hogsmill Sewage Treatment works upstream of Kingston town centre. Climate change and new development could increase this risk if not carefully managed.
- 4.3 Kingston town centre is at risk of relatively frequent flooding from the River Thames and River Hogsmill.

Flood Hazard

- 4.4 The SFRA has considered risk to life from flooding (flood hazard) and therefore assesses flood hazard due to overbank flooding. The modelling concluded that the likelihood of a rapid river rise in River Thames system and over bank flooding from the smaller catchments of the River Hogsmill and Beverley Brook posed only a small risk to life.
- 4.5 The Borough contains no water storage facilities therefore there is no potential risk of flood hazard due to reservoir failure.
- 4.6 There are two flood defence structures in the Borough, located at the Hogsmill Sewage Treatment Works and Motspur Park. As they are both located on the edge of the natural flood plain, the SFRA concludes that they are unlikely to experience a catastrophic collapse. There are also embankments , Robin Hood Way at Kingston

Vale and the railway embankment at Motspur Park that provide a barrier to the flow which provide protection against flooding on the dry side. These are considered unlikely to collapse as a result of flooding because they are substantially engineered.

Localised Drainage Issues – surface water, sewer and groundwater flooding

4.7 The SFRA investigated local flooding incidents and has indicated that the cause of these incidents is subjective. On July 20th 2007, the Borough experienced localised flooding where the Kingston Bypass A3 closed due to flooding in the Hook and New Malden underpasses. The town centre experienced severe flooding and the underpasses in the town centre flooded. In addition, Cambridge Road A240 had closed and no trains stopped at Kingston train station.

4.8 The SFRA highlights that localised flooding including surface water, groundwater flooding and surcharging of sewer system can occur anywhere within the Borough. The hot spots for surface water flooding are indicated on the SFRA maps.

Sewer flooding

4.9 The drainage (sewer) network is typically designed to cater for no greater than a 1 in 30 year design storm. For this reason, any event that exceeds this probability can be expected to result in overland flow that may pose a risk of flooding to local properties.

Groundwater Flooding

4.10 Evidence of historical groundwater flooding within the RBK is relatively limited. A large proportion of the Borough overlays London Clay and therefore the risk of groundwater flooding is very low. Areas adjoining the River Thames corridor are often characterised by deposits of gravel above the clay layer and called 'Thames Gravels'. There is evidence within adjoining Boroughs of groundwater flooding occurring some distance from the river as a result of water finding a pathway through the gravels during high river levels.

River Hogsmill Integrated Urban Drainage Pilot Study (Jacobs, 2008)

4.11 This Pilot Study considered the potential risk posed by flooding from other (non-river) sources, including surface water flooding (or overland flow), and the exceedance of the surface & foul sewer networks. Modelling was undertaken and it estimated that approximately 80 properties within the Borough are potentially at risk from surface water (flash) flooding in a 1 in 100 year storm event. This is flooding from runoff that is conveyed overland before reaching a drain or gully. A further 200 properties are potentially at risk from surcharging of the sewer network in the 1 in 100 year event. This is flooding from clean and/or foul water that exceeds the capacity of the underground sewer system, and is therefore surcharged back onto the surface. It highlighted that the densely populated areas of Berrylands and Southborough (adjoining the lower reaches of Surbiton Stream) are most susceptible to flooding caused by drainage network. This is supported to a large degree by the density of observed incidents of flooding within this area.

Impacts of Climate Change

4.12 Detailed modelling of the potential impacts of climate change upon fluvial flood risk within the RBK were carried out by the Environment Agency for the River Thames

and River Hogsmill. Within other areas of the Borough that have not been modelled, including Beverley Brook and the tributaries of the River Hogsmill, Zone 2 Medium Probability is considered a reasonable approximation of the likely extent of the High Probability flood zone in 100 years as a result of climate change. The modelling showed that climate change will not markedly increase the extent of river flooding within most areas of the Borough. It is important to recognise that those properties (and areas) that are currently at risk of flooding may be susceptible to more frequent, more severe flooding in future years as a result of climate change.

5. Implications for Development in Flood Risk Areas

5.1 The SFRA provides the basis for planning decisions concerning flood risk to be made however in line with PPS25, a Sequential Test approach has been undertaken and applied to the “indicative areas” for potential housing capacity as set out in the Core Strategy Pre-Submission Publication Version January 2011.

5.2 The section below discusses the implication for development for each flood zone.

Flood Zone 3b

5.3 Development within Zone 3b, the functional flood plain will only be considered following the application of the Sequential Test.

5.4 PPS25 states only water compatible development or essential infrastructure is permissible in Zone 3b. Essential infrastructure must pass the Exception Test for development to be permitted. The SFRA sets out the development management recommendations, requiring a minimum of 8m buffer zone must be provided to “top of bank” within sites immediately adjoining a river corridor. Proposed development must not result in an increase to maximum flood levels within adjoining properties.

5.5 A site specific FRA would be required and it must include an assessment of the:

- vulnerability of the development to flooding from other sources as well as river flooding,
- vulnerability of the development to flooding over the lifetime of the development for all sources of flooding
- flood defence
- provide details of existing site levels and proposed Sustainable Urban Drainage Systems (SUDS)
- Demonstrate that residual risks of flooding are acceptable through the use of flood resistant and resilient design
- Provide a statement about how the proposed development will contribute towards a positive reduction in flood risk

Flood Zone 3a

5.6 Development in Zone 3a will only be considered following the application of the Sequential Test. In line with PPS25, suitable uses are water compatible or less vulnerable development. More vulnerable development may only be considered if the Exception Test can be passed. Highly vulnerable development is not permitted within flood zone 3a. A site specific FRA will need to meet the same requirements set out in the above section on flood zone 3b. The development proposal will need to demonstrate dry access for a 1 in 100 year river flood. Self contained basement

dwelling and basement level sleeping accommodation are not permitted in zone 3a. A detailed assessment on the potential of the development to increase flood risk elsewhere will need to be carried out by an engineer. Proposed development must not result in an increase to maximum flood levels within adjoining properties.

Flood Zone 2

5.7 Future development will only be considered following the application of the Sequential Test. Suitable land use is Water Compatible, Less Vulnerable or more Vulnerable development. Highly vulnerable development may only be considered if the Exception Test can be passed. The development proposal will need to demonstrate dry access for a 1 in 100 year river flood. Basements must have an access point for escape that is above the 1 in 100 year river flood level, including climate change. Proposed development must not result in an increase to maximum flood levels within adjoining properties.

5.8 A FRA is required for all developments within Flood Zone 2 which should demonstrate that the residual risk of flooding to the property is effectively managed through raised flood levels and provision of planned evacuation route. Other sources of flooding must also be considered to ensure that existing flooding problems are not worsened.

Flood Zone 1

5.9 All land uses are considered appropriate in Flood Zone 1. However development may be susceptible to flooding from other sources. It is important that development does not increase flood risk elsewhere. A FRA is required for all sites greater than 1ha in area, it should assess localised flood risks including surface water and groundwater flooding.

6. Housing Development Need

6.1 As an attractive place to live, demand for housing is traditionally high in Kingston as reflected in the average house price across the Borough of £315,462 as compared to a national average of £164,773².

6.2 In recent years this demand has been exacerbated by population growth. Despite Kingston's population (156,000 in 2006) being the smallest of all the London boroughs (excluding the City of London), between 2002 and 2008 the population grew by 6.61%. This was a significantly higher rate of increase than the Outer London (2.47%) and Greater London (3.37%) averages. The Borough population is forecast to increase by a further 6.6% in the period 2006-2011 and by nearly 7% between 2011 and 2026³.

6.3 One of the key objectives of the Kingston Plan (the Borough's Community Plan) is to increase the supply of housing and its affordability. This is key to maintaining Kingston as a popular place to live. However, given the limited size of the Borough, and the large areas of Green Belt and Metropolitan Open Land, opportunities to deliver new housing within Kingston are limited. This is further exacerbated by a

² Land Registry, November 2010.

³ GLA Population Projections 2008 Round (High)

limited number of sites which are suitable for housing development and the need to safeguard land for other uses such as employment, open space and community facilities.

7. 'Indicative Areas' for Housing

- 7.1 The London Plan sets targets for the delivery of new homes on a borough by borough basis. The Plan is clear that these targets should be seen as a minimum and boroughs should seek to exceed them. The current target for new homes within Kingston is 385 new units a year. However, the Draft Replacement London Plan is proposing to reduce this to 375 per annum.
- 7.2 Capacity for new housing within Kingston has been assessed as part of the London-wide Strategic Housing Land Availability Assessment and Housing Capacity Study 2009 (SHLAA/HCS)⁴. The primary role of this study was to identify sites with potential for housing; consider their housing potential; and assess when they are likely to be developed. Table 1 and Figure 1 below outline the indicative location of the key sites (those over 0.25ha) identified as part of the SHLAA/HCS. The capacity figures for each site were derived using the Public Transport Accessibility Level (PTAL) of the site and the midpoint of the London Plan density matrix. All the sites identified as suitable for housing development, constituted previously developed land.
- 7.3 As part of the SHLAA/HCS process, the capacity figures on individual sites were discounted according to any identified constraints to development. One of the key strategic constraints picked up in the study was the degree to which the site might be at risk from flooding. Any sites identified as being in Flood Zone 3b were listed as unsuitable and given a 0% probability of being developed for housing, effectively excluding them from the study. The residential capacity of any sites identified within the Flood Risk Zones 3a and 2 was discounted according to the degree of mitigation measures needed in order to make the site developable. The mitigation measures identified within the study were: providing set-back on-site, providing on-site SUDS, provide other flood mitigation measures on-site, reducing density (no ground floor provision) or providing other off-site flood mitigation
- 7.4 It is important to note that these "indicative areas" do not equate to site allocations but were designed to give an indication of expected housing delivery across the Borough. Whilst the individual estimates of capacity are provisional the indicative figures suggest a combined capacity of around 2670 new conventional dwellings on these large sites.
- 7.5 The distribution of the figures in Table 1 below differ slightly from those set out in the Core Strategy Pre-Submission table (page 113) in order to take account of two sites that were included in the Kingston Town Centre cluster but in fact sit just outside the Town Centre boundary. These sites were not assessed as part of the sequential test carried out for the Kingston Town Centre Area Action Plan so have been re-allocated to Cluster 7: Norbiton Area and Cluster 4: Surbiton Area.
- 7.6 All other sites in the Kingston Town Centre Area are included in the Kingston Town Centre Area Action Plan and therefore not covered in this report. Kingston Town Centre has already been assessed in SFRA 2006. The potential for new housing in the town centre is considerable but a number of areas within the town centre are

⁴ www.london.gov.uk/publications/planning/london%E2%80%99s-housing-capacity-2009

located within Flood Risk Zone 3a. However, due to the presence of other planning restrictions that influence the town centre's regeneration, the assessment concluded that new residential development can only take place if safe (dry) access can be provided.

7.7 This report looks at Clusters 1 to 7. For each cluster, a brief housing context is provided, the proposed housing type, and flood risk identified. The Sequential Test and Exception Test are discussed followed by mitigation measures.

Table 1: Borough's Estimated Housing Capacity

Cluster	Indicative Area	Est. Total Capacity	Significant Sites
1	Chessington south/ Leatherhead Rd Area	100	Existing permissions on Leatherhead Rd.
2	Tolworth Area	700	Former UDP sites e.g. Former Government Offices and sites within the District Centre.
3	New Malden District Centre Area	120	Former UDP sites at Cocks Crescent and opportunities on Coombe Rd.
4	Surbiton District Centre Area	200	Former UDP site at Surbiton Station Car Park.
5	Ewell Rd/ King Charles Area	50	Opportunities along Ewell Road.
6	Villiers Road Area	50 (+ 800 - 1,300 student bedspaces)	Small sites and former UDP site at Unigate Milk Depot.
7	Norbiton Area	550	Opportunities along Cambridge Rd.
	Kingston Town Centre Area	900	K+20 Area Action Plan Proposal Sites.
Total		2670 (+ 800 - 1,300 student bedspaces)	

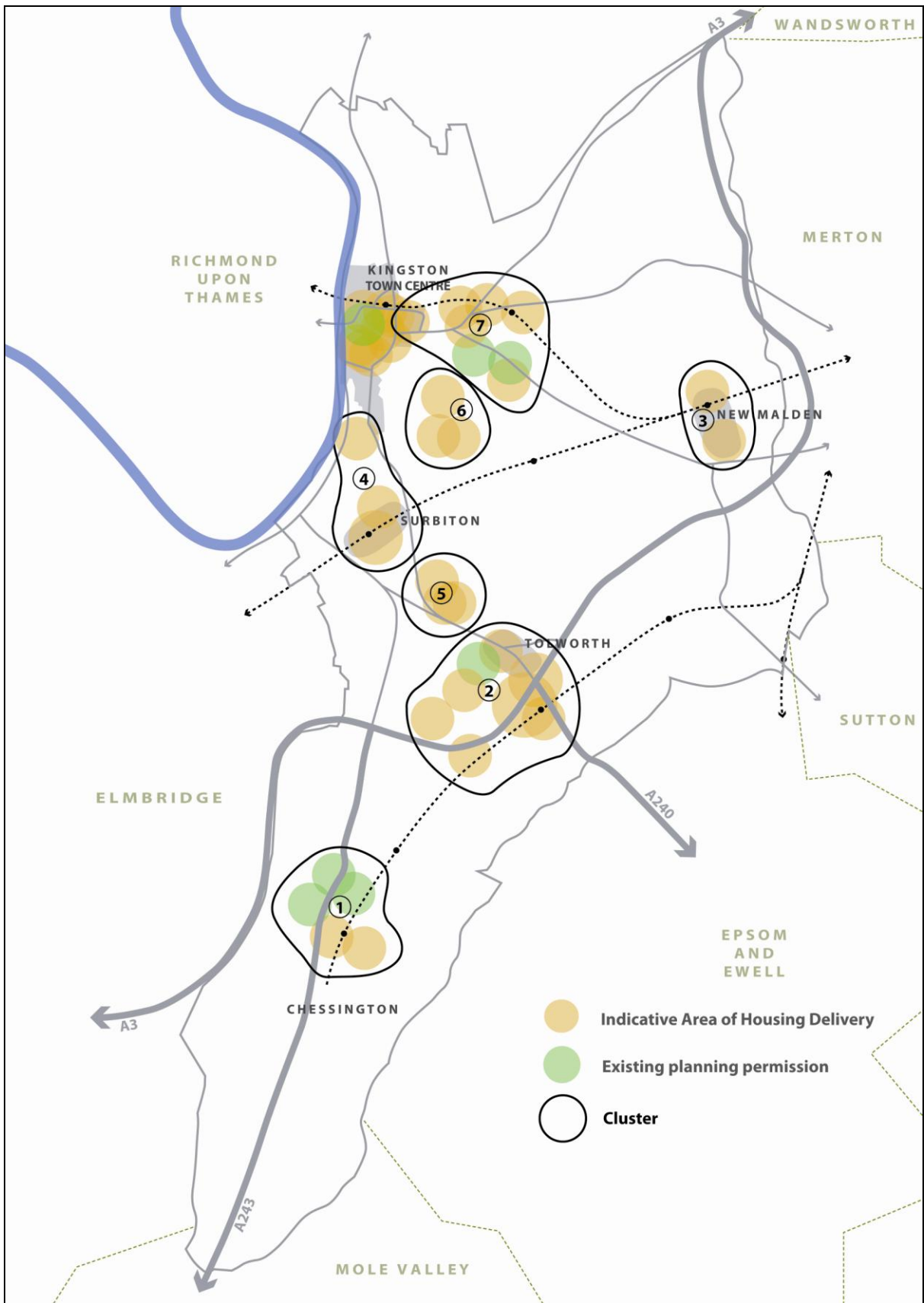


Figure 1: 'indicative areas' of Housing Delivery

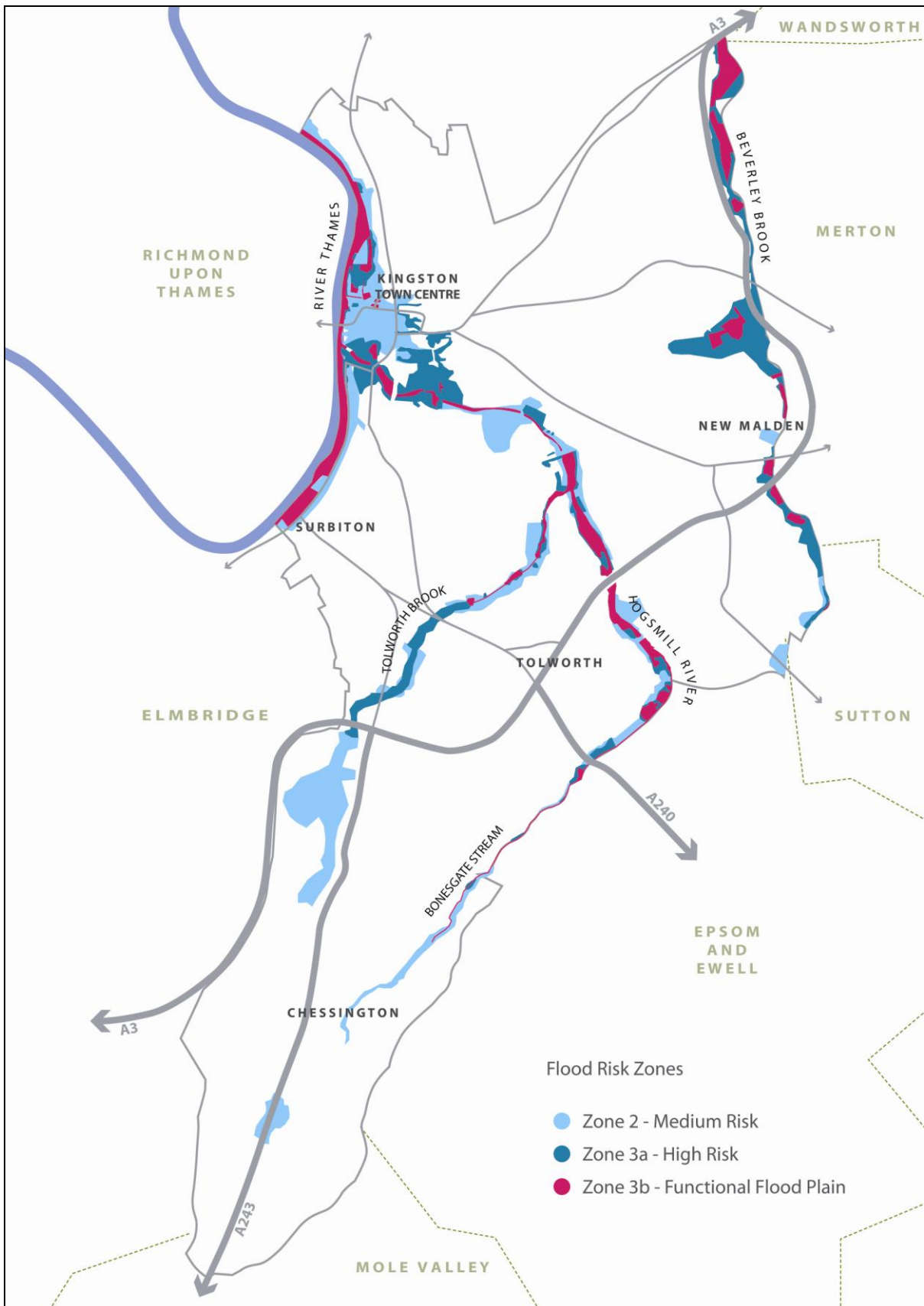


Figure 2: Flood Risk (Crown copyright. All rights reserved. The Royal Borough of Kingston. Licence No: 100019285)

8. Chessington south/ Leatherhead Rd Area - Cluster 1

8.1 This area is the first significant area of residential development when entering the borough from the south. The A243 (Leatherhead Road) is the main route through the area, gradually changing in character from rural in the south to being lined with suburban properties at its northern end.

8.2 The area is predominantly residential, but also has some large areas of purpose built business/industrial premises. The residential areas are predominantly 1930's detached, semi detached and short terraces with long gardens.

Proposed Use

8.3 The opportunities to deliver new housing in this area mostly consist of residential redevelopment or the change of small scale commercial units. A number of such sites already have planning permission for redevelopment.

Flood Risk

8.4 The majority of Cluster 1 is located within Flood Risk Zone 1, the lowest probability. However at the north east end of the cluster, a very small part is located partially within Flood Risk Zone 2 medium probability.

The Sequential Test

8.5 Housing is classified as a 'more vulnerable' use in Table D.2 of PPS25 (see Appendix 1). It is considered to be appropriate development in Flood Risk Zone 2 and 1, in line with Table D.3. Flood Risk Vulnerability and Flood Zone 'Compatibility' (see Appendix 1). The Exception Test is therefore not required in this instance.

8.6 Estimated housing capacity for this cluster is 100 dwellings/units and has been identified by the SHLAA. The delivery of housing in this area would contribute towards achieving the borough's housing target. The sequential approach supports the use of this cluster for potential new housing.

Mitigation Measures

8.7 Planning applications will be assessed in accordance with the Core Strategy's *Water Management and Flood Risk* policy DM4. A proactive approach through the positive reduction of flood risk through development should be adopted. Sustainable drainage techniques should be implemented where appropriate to ensure that runoff from the site does not exceed greenfield runoff rates and volumes. Planning applications for sites which are greater than 1ha in area which are located within Flood Risk Zone 1 will be required to submit a FRA. For proposed development within Flood Zone 2, the FRA must demonstrate that risk is managed e.g. through the use of raised floor levels. The *Royal Borough of Kingston upon Thames Strategic Flood Risk Assessment* sets out the detailed requirements for a FRA for each Flood Risk Zone.

9. Tolworth Area - Cluster 2

- 9.1 These sites area focused in and around Tolworth District Centre. Tolworth Broadway forms the main road through the district centre with predominantly retail and commercial uses at ground floor level with offices and some residential above. The 22 storey Tolworth Tower office building at the end of the Broadway is a dominant landmark. Outside the district centre, the area is characterised by 2-storey, detached and semi-detached houses with front and back gardens.
- 9.2 There are a number of major potential brownfield development sites in the area, including the vacant site at the former Government Offices on Toby Way. Outside of Kingston Town Centre this is the largest cluster of potential housing sites in the borough with capacity for around 700 new units.

Proposed Use

- 9.3 The sites within Tolworth District centre have potential for flats with amenity space, while outside the district centre developments should include family housing with gardens.

Flood Risk

- 9.4 Cluster 2 sits within Flood Risk Zone 1 low probability.

The Sequential Test

- 9.5 Housing is classified as a 'more vulnerable' use in Table D.2 of PPS25 (see Appendix 1). It is considered to be appropriate development in Flood Risk Zone 1, in line with Table D.3. Flood Risk Vulnerability and Food Zone 'Compatibility' (see Appendix 1). The Exception Test is therefore not required in this instance.
- 9.6 The SHLAA identified sites within this cluster as having potential for new housing developments. It is considered that the Tolworth Area is highly important due to its estimated capacity of approximately 700 units and the limited opportunities in the Borough for new housing. The delivery of new housing in the Tolworth Area would considerably help meet the borough's housing target. Due to the low flood risk, the sequential approach supports housing as appropriate development in this indicative area.

Mitigation measures

- 9.7 Planning applications will be assessed in accordance with Core Strategy's *Water Management and Flood Risk* policy DM4. A proactive approach through the positive reduction of flood risk through development should be adopted. Sustainable drainage techniques should be implemented where appropriate to ensure that runoff from the site does not exceed greenfield runoff rates and volumes. Planning applications for sites which are greater than 1ha in area which are located within Flood Risk Zone 1 will be required to submit a FRA. The *Royal Borough of Kingston upon Thames Strategic Flood Risk Assessment* sets out the FRA requirements for each Flood Risk Zone.

10. New Malden District Centre Area - Cluster 3

10.1 This is one of the smaller clusters of potential housing sites, in an area of the borough with limited scope for new, larger-scale housing developments. The sites are focused in and around New Malden District Centre, where there is a mix of retail and commercial uses set out along a traditional high street. New Malden is a thriving District Centre with easy access to the A3 and good rail links. Surrounding the District Centre are predominantly residential streets with a mix of units sizes and ages, although mostly in the form of houses as opposed to flats.

Proposed Use

10.2 The potential for new residential development lies mostly in the change of use and redevelopment of old commercial units - vacant office blocks etc- where there is some capacity for higher density flatted developments.

Flood Risk

10.3 Cluster 3: New Malden District Centre Area sits within Flood Risk Zone 1 low probability.

The Sequential Test

10.4 Housing is classified as a 'more vulnerable' use in Table D.2 of PPS25 (see Appendix 1). It is considered to be appropriate development in Flood Risk Zone 1, in line with Table D.3. Flood Risk Vulnerability and Flood Zone 'Compatibility' (see Appendix 1). The Exception Test is therefore not required in this instance.

10.5 The estimated capacity for new housing in the New Malden District Centre Area is 120 units as identified in the SHLAA. The delivery of housing in this indicative area would contribute towards meeting the borough's housing target. Due to the low flood risk, the sequential approach supports housing as appropriate development in this indicative area.

Mitigation measures

10.6 Planning applications will be assessed in accordance with Core Strategy's *Water Management and Flood Risk* policy DM4. A proactive approach through the positive reduction of flood risk through development should be adopted. Sustainable drainage techniques should be implemented where appropriate to ensure that runoff from the site does not exceed greenfield runoff rates and volumes. Planning applications for sites which are greater than 1ha in area which are located within Flood Risk Zone 1 will be required to submit a FRA. The *Royal Borough of Kingston upon Thames Strategic Flood Risk Assessment* sets out the FRA requirements for each Flood Risk Zone.

11. Surbiton District Centre Area - Cluster 4

11.1 This cluster of sites centres on Surbiton District Centre. The District Centre is defined by the railway line on its southern boundary, with Surbiton Hill Road bisecting the area into two distinct halves, the predominantly Victorian town centre to the west and the, Edwardian and other later suburban development to the east. A large proportion of the area is covered by a conservation area status.

11.2 The areas around the District Centre have relatively high residential densities, with tightly packed Victorian/ Edwardian development (many converted into flats) interspersed with some more modern, small scale flatted developments. The fast rail link into central London makes Surbiton a popular area with commuters.

Proposed Use

11.3 The largest area of potential redevelopment exists at Surbiton Station Car Park to the south of the Railway line.

Flood Risk

11.4 Cluster 4: Surbiton Area is located within Flood Risk Zone 1 low probability.

The Sequential Test

11.5 Housing is classified as a 'more vulnerable' use in Table D.2 of PPS25 (see Appendix 1). It is considered to be appropriate development in Flood Risk Zone 1, in line with Table D.3. Flood Risk Vulnerability and Flood Zone 'Compatibility' (see Appendix 1). The Exception Test is therefore not required in this instance.

11.6 There is an estimated capacity of 200 units as identified by the SHLAA for the Surbiton Area. The delivery of housing in this indicative area would contribute towards meeting the borough's delivery target. Due to the low flood risk, the sequential approach supports housing as appropriate development in this indicative area.

Mitigation measures

11.7 Planning applications will be assessed in accordance with Core Strategy's *Water Management and Flood Risk* policy DM4. A proactive approach through the positive reduction of flood risk through development should be adopted. Sustainable drainage techniques should be implemented where appropriate to ensure that runoff from the site does not exceed greenfield runoff rates and volumes. Planning applications for sites which are greater than 1ha in area which are located within Flood Risk Zone 1 will be required to submit a FRA. The *Royal Borough of Kingston upon Thames Strategic Flood Risk Assessment* sets out the FRA requirements for each Flood Risk Zone.

12. Ewell Rd/ King Charles Area - Cluster 5

12.1 This is one of the two smallest clusters of potential housing sites in the Borough. The sites do not fall within the district of town centres but do lie along one of the main routes between Surbiton and Tolworth.

12.2 The area is mostly residential with smaller scale mix of 1930's and high quality Victorian and Edwardian houses, as well as some later developments of flats set on large plots amongst mature landscape. Ewell Road has a number of significant landmark buildings at its northern end as well as clusters of small parades of retail units.

Proposed Use

12.3 The potential for new residential development consists mostly of the redevelopment of underused small scale office and commercial uses.

Flood Risk

12.4 The majority of Cluster 5: Ewell Road/King Charles Area is located within Flood Risk Zone 1 low probability. A small part of this cluster area is located within Flood Risk Zone 3a high probability.

The Sequential Test

12.5 Housing is classified as a 'more vulnerable' use in Table D.2 of PPS25 (see Appendix 1). It is considered to be appropriate development in Flood Risk Zone 1, but not in Flood Risk Zone 3a in line with Table D.3. Flood Risk Vulnerability and Food Zone 'Compatibility' (see Appendix 1).

12.6 A potential of 50 housing units has been identified for this area. The delivery of new housing in this area would contribute towards the achievement of the borough's housing target. Due to presence of a low flood risk, the sequential approach supports housing as appropriate development in this indicative area.

The Exception Test

12.7 A small part of this area is located within Flood Risk Zone 3a and although preference is given to Flood Risk Zone 1 and 2, other planning considerations need to be taken into account. If a site were to come forward for development within this zone then applicants and developers will be required to demonstrate that the Exception Test criteria can be passed as set out in PPS25.

Mitigation measures

12.8 Planning applications will be assessed in accordance with Core Strategy's *Water Management and Flood Risk* policy DM4. A proactive approach through the positive reduction of flood risk through development should be adopted. Sustainable drainage techniques should be implemented where appropriate to ensure that runoff from the site does not exceed greenfield runoff rates and volumes. Planning applications for sites which are greater than 1ha in area which are located within Flood Risk Zone 1 will be required to submit a FRA.

12.9 To mitigate the risk of flooding, proposed residential development in Zone 3a will need to demonstrate that the development is safe, without increasing flood risk elsewhere. Appropriate methods to reduce flood risk are the use of raised floor levels, the provision of dry access and implementation of sustainable urban drainage systems. Basement dwellings are not permitted within Flood Risk Zone 3a high probability. The *Royal Borough of Kingston upon Thames Strategic Flood Risk Assessment* sets out the FRA requirements for each Flood Risk Zone.

13. Villiers Road Area - Cluster 6

13.1 This is one of the two smallest clusters of potential housing sites in the Borough. The cluster does not fall within any of the district or town centres.

13.2 The area is mostly residential with smaller scale mix of 1930's and Victorian and Edwardian houses, as well as some later developments of small scale flatted developments. To the east of this cluster sits the Hogsmill Valley area, a large area of MOL, identified in the Core Strategy as a Key Area of Change. There are some small pockets of low density commercial/ light industrial uses, mostly along the Hogsmill River.

Proposed Use

13.3 The potential for new residential development consists mostly of the redevelopment of underused small scale commercial units.

Flood Risk

13.4 Cluster 6: Villiers Road Area is partially located in Flood Risk Zone 2 medium probability and Flood Risk Zone 1 low probability.

The Sequential Test

13.5 Housing is classified as a 'more vulnerable' use in Table D.2 of PPS25 (see Appendix 1). It is considered to be appropriate development in Flood Risk Zone 2 and 1, in line with Table D.3. Flood Risk Vulnerability and Food Zone 'Compatibility' (see Appendix 1). The Exception Test is therefore not required in this instance.

13.6 The estimated housing capacity for the Villiers Road Area is 50 units as identified by the SHLAA. The provision of new housing in this indicative area would help meet the borough's housing target. Due to the low flood risk, the sequential approach supports housing as appropriate development in this indicative area.

Mitigation measures

13.7 Planning applications will be assessed in accordance with Core Strategy's *Water Management and Flood Risk* policy DM4. A proactive approach through the positive reduction of flood risk through development should be adopted. For example, the use of sustainable drainage techniques should be implemented where appropriate to ensure that runoff from the site does not exceed greenfield runoff rates and volumes. Planning applications for sites which are greater than 1ha in area which are located within Flood Risk Zone 1 will be required to submit a FRA.

13.8 For any proposed development within Flood Zone 2, the FRA must demonstrate that risk is managed e.g. through the use of raised floor levels. The *Royal Borough of Kingston upon Thames Strategic Flood Risk Assessment* sets out the FRA requirements for each Flood Risk Zone.

14. Norbiton Area - Cluster 7

14.1 This is the largest cluster of potential housing sites outside the Town and District Centres. The majority of sites are focused along main routes of London Road and Cambridge Road/ Kingston Road to east of Kingston Town Centre. Kingston Road is a major route into Kingston from the A3. To the south of this cluster sits the Hogsmill Valley area, a large area of MOL, identified in the Core Strategy as a Key Area of Change.

14.2 The area is mostly urban in character with a mix of different land uses- residential, offices, retail, warehousing all built at relatively high densities. The existing residential stock varies significantly in age and style and area includes a significant amount of the Borough's social housing

Proposed Use

14.3 There are a variety of different opportunities for new housing within this cluster, from smaller scale infill development within the established residential areas, to higher density flatted development closer to Kingston Town centre along the main routes.

Flood Risk

14.4 Cluster 7: Norbiton Area is largely located within Flood Risk Zone 1 and a small area is within Flood Risk Zone 3a high probability.

The Sequential Test

14.5 Housing is classified as a 'more vulnerable' use in Table D.2 of PPS25 (see Appendix 1). It is considered to be appropriate development in Flood Risk Zone 1, in line with Table D.3. Flood Risk Vulnerability and Flood Zone 'Compatibility' (see Appendix 1).

14.6 The SHLAA indicates there is a potential housing capacity for the Norbiton Area of 550 units. The Norbiton Area is the second largest area for potential new housing following the Tolworth Area in the borough. The delivery of housing in this area would significantly contribute towards meeting the borough's housing target.

14.7 In terms of the Sequential Test, the Norbiton Area is suitable for housing because it is in a low risk flood zone.

The Exception Test

14.8 A small part of this area is located within Flood Risk Zone 3a and although preference is given to Flood Risk Zone 1 and 2, other planning considerations need to be taken into account. If a site were to come forward for development within this zone then applicants and developers will be required to demonstrate that the Exception Test criteria can be passed as set out in PPS25.

Mitigation measures

14.9 Planning applications will be assessed in accordance with Core Strategy's *Water Management and Flood Risk* policy DM4. A proactive approach through the positive

reduction of flood risk through development should be adopted. Sustainable drainage techniques should be implemented where appropriate to ensure that runoff from the site does not exceed greenfield runoff rates and volumes. Planning applications for sites which are greater than 1ha in area which are located within Flood Risk Zone 1 will be required to submit a FRA.

- 14.10 To reduce the risk of flooding, proposed residential development in Zone 3a will need to demonstrate that the development is safe, without increasing flood risk elsewhere. Appropriate methods would be the use of raised floor levels, provision of dry access, use of sustainable urban drainage systems. Basement dwellings are not permitted within Flood Risk Zone 3a high probability. The *Royal Borough of Kingston upon Thames Strategic Flood Risk Assessment* sets out the FRA requirements for each Flood Risk Zone.

15. Conclusion

- 15.1 There are limited opportunities in the Borough to meet housing needs and delivery targets. Development is limited by the presence of large areas of protected open land, designated Metropolitan Open Land and Green Belt. This is further exacerbated by a limited number of sites which are suitable for housing development and the need to safeguard land for other uses such as employment, open space and community facilities. Cluster 2: Tolworth Area and Cluster 7: Norbiton Area, have the potential to deliver large numbers of new housing and they would contribute significantly to meeting the borough's housing target. The opportunity for new housing in the other clusters is smaller but the provision of new housing in these "indicative areas" would together contribute towards the Borough's housing target
- 15.2 Clusters 1 to 7 represent the 'indicative areas' identified in the Core Strategy Pre-Submission Publication Version. These "indicative areas" have been informed by the SHLAA, assessing capacity for new housing. It is important to note that the SHLAA process excluded any sites located within Flood Risk Area 3b, the functional flood plain. This report shows that the "indicative areas" covered by Clusters 1 to 7 are largely located within Flood Risk Zone 1 low probability. However, Cluster 1: Chessington South/Leatherhead Road Area and Cluster: 6 Villiers Road Area are located in Flood Risk Zone 1 and 2. Whilst a small area of Cluster 5: Ewell Road/King Charles Area and Cluster 7: Norbiton Area are located within Flood Risk Zone 3a high probability. Although a small area of Clusters 5 and 7 fall within Flood Risk Zone 3a, it is considered that seeking housing capacity in lower risk flooding zones is not required due to the presence of other planning considerations and that the flood risk posed can be overcome through the implementation of mitigation measures. Any future planning applications for new housing development in Flood Risk Zone 3a will need to pass the criteria of the Exception Test set out in PPS25.

Appendix 1: PPS25

Extracts taken from Annex D: The Sequential Test and Exception Test, PPS25: Development and Flood Risk 2010, p.22 - 27

Table D.1: Flood Zones

(Note: These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences)

Zone 1 Low Probability

Definition

This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%).

Appropriate uses

All uses of land are appropriate in this zone.

FRA requirements

For development proposals on sites comprising one hectare or above the vulnerability to flooding from other sources as well as from river and sea flooding, and the potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the new development on surface water run-off, should be incorporated in a FRA. This need only be brief unless the factors above or other local considerations require particular attention. See Annex E for minimum requirements.

Policy aims

In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development, and the appropriate application of sustainable drainage techniques.

Table D.1: contd.

Zone 2 Medium Probability

Definition

This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% – 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% – 0.1%) in any year.

Appropriate uses

The water-compatible, less vulnerable and more vulnerable uses of land and essential infrastructure in Table D.2 are appropriate in this zone.

Subject to the Sequential Test being applied, the highly vulnerable uses in Table D.2 are only appropriate in this zone if the Exception Test (see para. D.9.) is passed.

FRA requirements

All development proposals in this zone should be accompanied by a FRA. See Annex E for minimum requirements.

Policy aims

In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area through the layout and form of the development, and the appropriate application of sustainable drainage techniques.

Zone 3a High Probability

Definition

This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

Appropriate uses

The water-compatible and less vulnerable uses of land in Table D.2 are appropriate in this zone.

The highly vulnerable uses in Table D.2 should not be permitted in this zone.

The more vulnerable and essential infrastructure uses in Table D.2 should only be permitted in this zone if the Exception Test (see para. D.9) is passed. Essential infrastructure permitted in this zone should be designed and constructed to remain operational and safe for users in times of flood.

FRA requirements

All development proposals in this zone should be accompanied by a FRA. See Annex E for minimum requirements.

Table D.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 use. • Installations requiring hazardous substances consent.¹⁹ (Where there is a 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’²⁰).
More Vulnerable	<ul style="list-style-type: none"> • Hospitals. • Residential institutions such as residential care homes, children’s homes, social services homes, prisons and hostels. • Buildings used for: dwelling houses; student halls of residence; drinking establishments; nightclubs; and hotels. • Non-residential uses for health services, nurseries and educational establishments. • Landfill and sites used for waste management facilities for hazardous waste.²¹ • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

Table D.3²³: Flood Risk Vulnerability and Flood Zone ‘Compatibility’

Flood Risk Vulnerability classification (see Table D2)		Essential Infrastructure	Water compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone (see Table D.1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	✗	Exception Test required	✓
	Zone 3b ‘Functional Flood plain’	Exception Test required	✓	✗	✗	✗

Key:

✓ Development is appropriate

✗ Development should not be permitted