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Strategic Flood Risk Assessment

Addendum

October 2014

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Contract

This report describes work commissioned by Vale of White Horse and South Oxfordshire District Councils, by an email dated 16th September 2014. The Councils' representative for the contract was Katherine Macdonald.

Purpose

This document has been prepared as a Strategic Flood Risk Assessment Addendum for Vale of White Horse District Councils. JBA Consulting accepts no responsibility or liability for any use that is made of this document other than by the Client for the purposes for which it was originally commissioned and prepared.

Acknowledgements

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Abbreviations and Definitions

Actual Risk		The risk posed to development situated within a defended area (i.e. behind defences), expressed in terms of the probability that the defence will be overtopped, and/or the probability that the defence will suffer a structural failure, and the consequence should a failure occur
Annual Event Probability	AEP	Expresses the probability of a flood event of a specific magnitude occurring in any one year. For example, the 1 in 100 year flood event is expressed as the 1% AEP; there is a 1% chance of it occurring within any given year.
Area Action Plan	AAP	Planning document to guide development in a specific area. Forms part of the Local Plan.
Area Benefiting from Defence	ABD	Those areas which benefit from formal flood defences in the event of flooding from rivers with a 1% chance in any given year or from the sea with a 0.5% chance in any given year. If the defences were not there, these areas would be flooded.
Asset Information Management System	AIMS	Environment Agency's asset database
Areas Susceptible to Groundwater Flooding	AStGWF	National map produced by the Environment Agency showing areas susceptible to groundwater emergence.
Brownfield		Brownfield (sites or land) is a term in common usage that may be defined as 'development sites or land that has previously been developed'.
Combined sewer overflow	CSO	In combined sewerage systems, foul drainage and surface water are conveyed in the same piped system. During rainfall, when flows in the combined sewer are high, excess flow is diverted to watercourses or ground in order to reduce the risk of combined sewer flooding. CSOs can be a significant source of pollution to watercourses.
Core Strategy	CS	Term no longer used to describe a Development Plan Document setting out the long-term spatial vision, strategic objectives and policies relating to future development of an area. Where they remain, the Core Strategy forms part of the Local Plan.
Defended Area		An area offered a degree of protection against flooding through the presence of a flood defence structure
Development Plan Documents	DPDs	Documents that make up the Local Plan and form part of the statutory development plan for the areas. DPDs must include the Local Plan and adopted Policies Map. All DPDs are subject to public consultation and independent examination.
Flood Alleviation Scheme	FAS	Works designed to provide protection from flooding.
Flood Risk Management		The introduction of mitigation measures (or options) to reduce the risk posed to property and life as a result of flooding. It is not just the application of physical flood defence measures
Flood and coastal erosion risk management Grant in Aid	FCRMGiA	Central government funding to flood risk management authorities to pay for a range of activities including schemes that help reduce the risk of flooding and coastal erosion.
Flood Estimation Handbook	FEH	Provides current methodologies for estimation of flood flows for the UK
Flood Map for Surface Water	FMfSW	National map produced by the Environment Agency showing flood risk from surface water at the 30 year and 200 year return periods.
Floodplain		Any area of land over which water flows or is stored during a flood event or would flow but for the presence of defences
Flood Risk Assessment	FRA	A detailed site-based investigation that is undertaken by the developer at planning application stage
Flood Storage Area	FSA	Area designed to store water in a flood and release it later when flood waters have subsided.
Flood Zone		Areas of land at risk from tidal or fluvial flooding as delineated by the Environment Agency. Zone 1: Flooding predicted to occur less than once every thousand years (<0.1% Annual Event Probability) Zone 2: Flooding predicted to occur at least once every thousand years (0.1% Annual Event Probability) Zone 3: Flooding predicted to occur at least once every hundred years (1% Annual Event Probability)
Fluvial Flooding		Flooding caused by high flows in rivers or streams exceeding the capacity of the normal river channel.

Formal Defence		A flood risk asset which is maintained by any party to fulfil a flood defence function in agreement with the Environment Agency.
Freeboard		A 'safety margin' to account for residual uncertainties in water level prediction and/or structural performance, expressed in mm
Functional Floodplain		An area of land where water has to flow or be stored in times of flood.
Flood and Water Management Act	FWMA	An Act to make provision about water, including provision about the management of risks in connection with flooding and coastal erosion.
Greenfield		Greenfield (sites or land) is a term in common usage that may be defined as 'development sites or land that has not previously been developed'.
Historic Flood Map	HFM	National map produced by the Environment Agency showing historical flood extents.
Informal Defence		An asset which was not designed for flood defence and is not maintained for this purpose, but forms some flood defence function.
ISIS		One-dimensional river modelling software developed by Halcrow. Capable of steady and unsteady state simulation.
Lead Local Flood Authority	LLFA	Body responsible for managing flood risk from localised sources across the County and a developing a strategy for local flood risk management that encompasses all sources of flooding (Oxfordshire County Council)
LIDAR		Light Detection and Ranging. An airborne laser mapping technique producing precise elevation data.
Local Development Framework	LDF	This term has been replaced by the term 'Local Plan'. It was used to describe a portfolio of Local Development Documents that provide a framework for delivering the spatial planning strategy for the area.
Local Plan	LP	The plan for the future development of the local area, drawn up by the local planning authority in consultation with the community. In law this is described as the development plan documents adopted under the Planning and Compulsory Purchase Act 2004. Current core strategies or other planning policies, which under the regulations would be considered to be development plan documents, form part of the Local Plan. The term includes old policies which have been saved under the 2004 Act.
Local Planning Authority	LPA	
Main River		Larger streams and watercourses, for which the Environment Agency is the designated body responsible for flood risk management.
Measure		A deliverable solution that will assist in the effective management (reduction) of risk to property and life as a result of flooding, e.g. flood storage, raised defence, effective development control and preparedness, and flood warning
Mitigation		The management (reduction) of flood risk
National Flood and Coastal Defence Database	NFCDD	A database, maintained by the Environment Agency, of fluvial and coastal assets. Flood defence assets are included, as are other assets with other functions such as footbridges on towpaths.
National Planning Policy Framework	NPPF	The NPPF sets out the Government's planning policies for England and how these are expected to be applied at a local level.
OfWAT		The Water Services Regulation Authority. The economic regulator of the Water Industry in England and Wales.
Oxfordshire County Council	OCC	Lead Local Flood Authority covering both Districts.
Ordinary Watercourses		All watercourses other than Main Rivers. The Lead Local Flood Authority is the designated body responsible for flood risk management.
Probability	1%	A measure of the chance that an event will occur. The probability of an event is typically defined as the relative frequency of occurrence of that event, out of all possible events. Probability can be expressed as a fraction, % or a decimal. For example, the probability of obtaining a six with a shake of a fair dice is 1/6, 16% or 0.166. Probability is often expressed with reference to a time period, for example, annual exceedance probability
Property Level Protection	PLP	Schemes that protect property from flooding at the property scale, for example installing flood barriers on doors, air brick covers etc.
Rapid Inundation Zone		An area immediately behind defences which, should they fail, will generate a combination of high velocities and flood depths that would cause a risk to life.
Residual Risk		The risk that inherently remains after implementation of a mitigation measure (option)
Return Period		The expected (mean) time (usually in years) between the exceedance of a particular extreme threshold. Return period is traditionally used to express the frequency of occurrence of an event, although it is often

		misunderstood as being a probability of occurrence.
Risk		The threat to property and life as a result of flooding, expressed as a function of probability (that an event will occur) and consequence (as a result of the event occurring)
SuDS Approving Body	SAB	The Flood and Water Management Act calls for the establishment of a SuDS Approving Body to be set up within lead local flood authorities. The SAB must approve all new drainage systems for new and redeveloped sites and highways to be before construction can commence.
Sewer		A pipeline, usually underground, designed to carry foul sewage and/or surface water from buildings and paved areas associated with buildings in more than one curtilage (plot of land).
Site Specific Allocations	SSAs	Allocation of sites for specific or mixed-use development.
South Oxfordshire District Council	SODC	
Standard of Protection	SoP	The return period to which properties are protected against flooding
Strategic Flood Risk Assessment	SFRA	The assessment of flood risk on a catchment-wide basis for proposed development in a District
Sewage Treatment Works	STW	
Supplementary Planning Documents	SPD	Supplementary Planning Documents or SPD support DPDs in that they may cover a range of issues, both thematic and site specific. Examples of SPD may be design guidance or development briefs. SPD may expand policy or provide further detail to policies in a DPD. They will not be subject to independent examination.
Surface Water Management Plan	SWMP	Projects to investigate local flooding issues such as flooding from sewers, drains, groundwater, and runoff from land, small watercourses and ditches that occurs as a result of heavy rainfall. Carried out through a partnership of all relevant stakeholders including local authorities, internal drainage boards, sewerage undertakers and the Environment Agency.
Sustainability Appraisal	SA	A Sustainability Appraisal is a systematic process to predict and assess the economic, environmental and social effects likely to arise from DPDs and SPDs, enabling each document to be tested and refined, ensuring that it contributes towards sustainable development.
Sustainable (Urban) Drainage System	SuDS	Current 'best practice' for new urban development that seeks to minimise the impact upon the localised drainage regime, e.g. through the use of pervious areas within a development to reduce the quantity of runoff from the site
Upper Thames Major Resource Development	UTMRD	Thames Water proposal for a large new storage reservoir to the west of Abingdon.
Uncertainty		A reflection of the (lack of) accuracy or confidence that is considered attributable to a predicted water level or flood extent
Vale of White Horse District Council	VOWH	
Water Framework Directive	WFD	European Union directive designed to improve and integrate the way water bodies are managed throughout Europe

1 Introduction

1.1 Background

This document is an addendum to the July 2013 South Oxfordshire District Council (SODC) and Vale of White Horse District Council (VOWH) Strategic Flood Risk Assessment (SFRA) Final Report¹. Since the SFRA was published, a Strategic Housing Market Assessment (SHMA) for Oxfordshire has been published. The SHMA sets an increased housing target for the Vale of White Horse District, necessitating new housing sites to be allocated in Local Plan 2031 Part 1.

This addendum will take account of the new sites to be allocated and other changes since the final report was published, such as changes in legislation and flood risk policy. It is intended to complement but not replace the existing SFRA.

1.2 Objectives

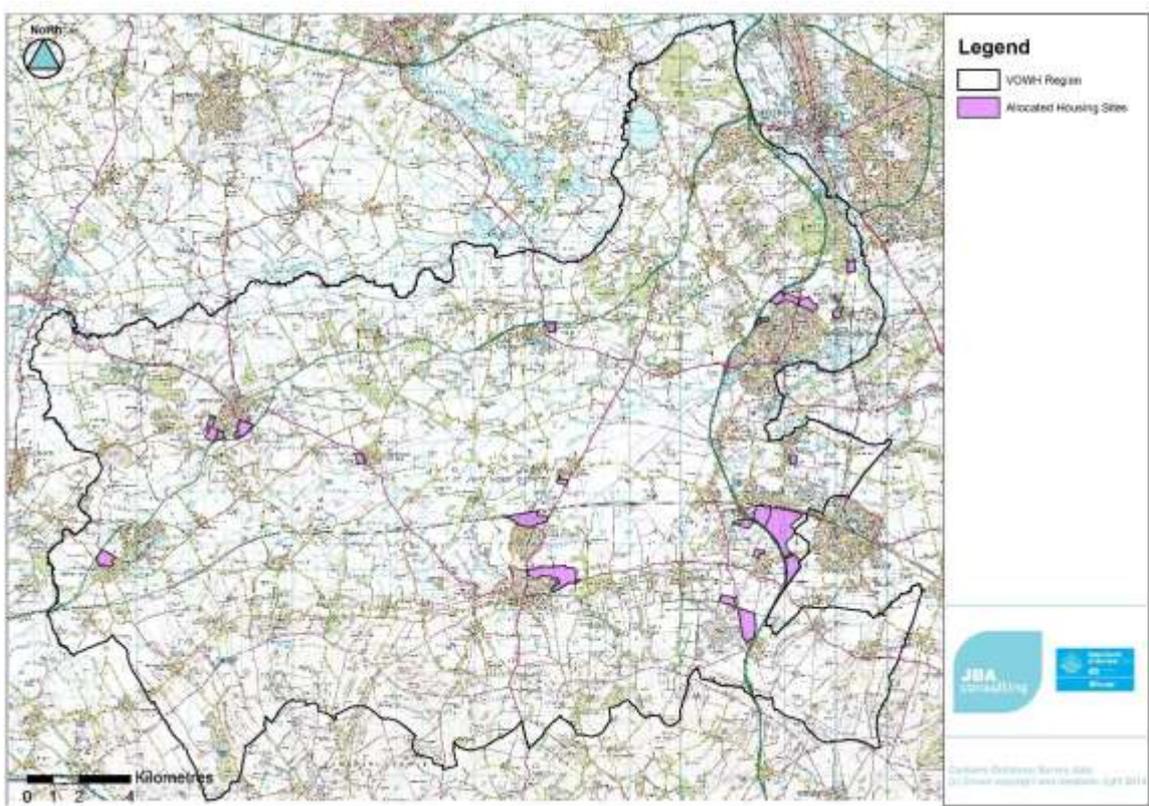
The key objectives of the SFRA addendum are to:

- Prepare an assessment of flood risk at 21 new sites, following the site assessment format used in Appendix B.2 of the SFRA.
- Update on significant policy and other changes since July 2013, including the National Planning Policy Practice Guidance on Flood Risk published in early 2014.
- Incorporate into mapping and assessment recent modelling changes to the functional floodplain at South Hinksey.

1.3 Study area

Figure 1-1 shows the location of new housing sites across the VOWH to be allocated in Local Plan 2031 Part 1.

Figure 1-1: The location of new housing sites to be allocated in the Local Plan 2031



¹ 2013s6892 Vale of White Horse and South Oxfordshire District Council Strategic Flood Risk Assessment Final Report (July 2013).
2014s1578 VoWH SFRA Addendum v1-3 FINAL

2 The Planning Framework and Flood Risk Policy

2.1 Introduction

The overarching aim of planning policy on development and flood risk is to ensure that flood risk is taken into account at all stages of the planning process. The purpose of this section of the report is to provide information on the main changes to the planning framework, flood risk responsibilities and flood risk policy since the 2013 VOWH and SODC SFRA was published. These changes have been taken into account in preparing this VOWH SFRA addendum.

2.2 National Planning Policy Framework

The National Planning Policy Framework (NPPF)² was issued on 27 March 2012 to replace the previous documentation, as part of reforms to make the planning system less complex and more accessible, to protect the environment and to promote sustainable growth. It replaces the Planning Policy Guidance Notes (PPGs) and Planning Policy Statements (PPSs).

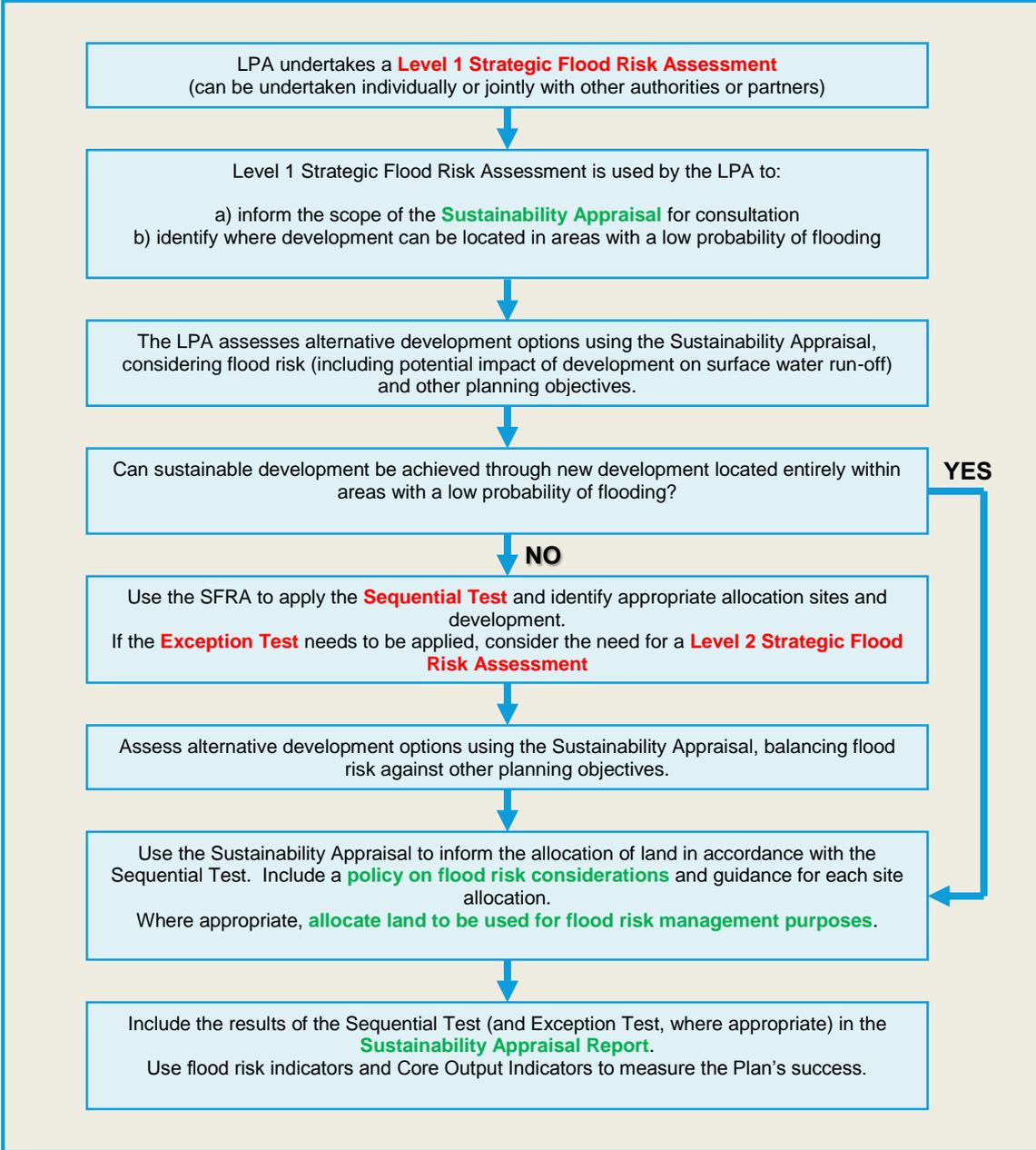
The NPPF is a source of guidance for local planning authorities to help them prepare Local Plans and for applicants preparing planning submissions. Paragraph 100 of the NPPF states “Local Plans should be supported by a strategic flood risk assessment and develop policies to manage flood risk from all sources, taking account of advice from the Environment Agency and other relevant flood risk management bodies, such as Lead Local Flood Authorities and Internal Drainage Boards. Local Plans should apply a sequential, risk-based approach to the location of development to avoid, where possible, flood risk to people and property and manage any residual risk, taking account of the impacts of climate change”

In March 2014 Planning Practice Guidance on flood risk³ was published, alongside the NPPF and sets out how the policy should be implemented. Diagram 1 in the Planning Practice Guidance also sets out how flood risk should be taken into account in the preparation of Local Plans.

² National Planning Policy Framework, Department of Communities and Local Government (2012)
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

³ Planning Practice Guidance: Flood Risk and Coastal Change (2014)
<http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/>
2014s1578 VoWH SFRA Addendum v1-3 FINAL

Figure 2-1: Flood risk and the preparation of Local Plans†



† Based on Diagram 1 of NPPF Planning Practice Guidance: Flood Risk and Coastal Change (paragraph 004, Reference ID: 7-021-20140306) March 2014

2.3 Oxfordshire Local Flood Risk Management Strategy

2.3.1 Summary

As outlined in Table 2.1 and Section 2.3.1 of the VOWH and SODC SFRA Final Report as a new and emerging responsibility in Oxfordshire, the Lead Local Flood Authority (Oxfordshire County Council) has a legal duty under the Flood and Water Management Act 2010 to produce a flood risk management strategy. This outlines how flood risk will be dealt with within the county. The strategy has been developed in partnership with the City and District Councils and the EA, however Oxfordshire County Council remains the lead authority in developing and delivering the strategy⁴.

⁴ Oxfordshire County Council Local Flood Risk Management Strategy
<http://www.oxfordshire.gov.uk/cms/content/oxfordshire-local-flood-risk-management-strategy>
 2014s1578 VoWH SFRA Addendum v1-3 FINAL

The strategy was open for public consultation from the 27th June until the 19th September 2014 and the results will be published by 21 Oct 2014. The final strategy will be prepared for approval by the council's cabinet later in 2014 and will include the following:

- information on local flood risk in Oxfordshire, highlighting where problems have already occurred, or where areas fall in risk categories,
- clarification of which authority is responsible for what in relation to the prevention and management of flooding,
- detail on the measures that will be undertaken to manage flood risk,
- clarification on how flood risk management funding is to be prioritised and
- measures that communities can undertake to improve flood resilience, as it is not possible to stop all flooding.

2.3.2 Role for Spatial Planning

An objective of the strategy is to prevent an increase in flood risk from development where possible by preventing additional flow entering existing drainage systems and watercourses. Spatial planning has a role in delivering this by:

- ensuring that planning decisions take proper account of all flood risks,
- ensuring that new developments include proper and consistent management of surface water,
- promoting sustainable drainage on all proposed developments and redevelopments,
- ensuring that planning and other guidance documents include reference to advice on flood management and these wider environmental issues,.
- preparing Advisory Guidelines to planning authorities about sustainable drainage systems in new developments in order to promote the need for no increase in surface water flow from sites,
- giving guidance on new site layouts and levels and
- advising on impacts on natural environments and informing about inspection systems.

2.4 Oxford Flood Alleviation Scheme

Following the winter flooding in 2014, the flood risk management options for Oxford and Abingdon are being reviewed and progressed. Updated flood modelling completed in 2013, and increased local interest to find flooding solutions prompted the Environment Agency to begin a formal review of the strategy recommendations in March 2014. The Oxford and Abingdon Scheme is being progressed by the Environment Agency and partners led by Oxfordshire County Council.

The Environment Agency are exploring and testing all viable options to define a technically, environmentally and financially acceptable scheme to reduce fluvial flood risk in Oxford. One of the options is to improve flood flow capacity through the western floodplain of Oxford with a conveyance channel. This has not yet been approved or designed.

A number of projects are also being progressed for Abingdon. The Environment Agency are in the initial stages of reviewing all options with VoWHDC to identify the most appropriate solutions to manage flood risk. As part of this review, the Environment Agency are investigating a potential flood storage area on the River Ock, upstream of the A34; an additional flood storage area and localised culvert improvements in the River Stert catchment and a flood wall and property level protection at St Helen's Mill.

Both the 'Oxford Flood Alleviation scheme' and the proposed Flood Risk Management measures in Abingdon are not intended to make any sites of strategic significance available for more vulnerable uses such as housing. The schemes are being designed to reduce fluvial flood risk to existing properties and infrastructure and not to open up undeveloped areas.

The latest information on the scheme is available via the EA website on a 'fact sheet'⁵. A potential option, although not yet approved or designed, is to improve flood flow capacity through a conveyance channel around the western flood plain of Oxford, providing not only a reduction in

⁵ Oxford Flood Alleviation Scheme (September 2014)

flood risk but economic and environmental benefits to surrounding Oxfordshire. This is likely to reduce flood risk in parts of the VOWH, most significantly Botley and, via complementary measures being considered in the town of Abingdon. The scheme would have to ensure that there would be no adverse flood risk to communities downstream due to increased flows and levels. This would be demonstrated through a detailed FRA, in line with the National Planning Policy Framework.

The full cost of the scheme is estimated to be over £100 million and will attract funding from numerous parties such as Defra Grant in Aid under the partnership funding approach and third parties. In July 2014 the Oxfordshire Local Enterprise Partnership was awarded £26 million towards the project which will help close the funding gap and enable the scheme to progress. This is a significant funding contribution towards flood risk management measures for Oxford.

2.5 Update on Implementation of SuDS

Schedule 3 of the Flood and Water Management Act (FWMA) (not yet enacted), deals with Sustainable Drainage Systems (SuDS). The Act calls for the establishment of a SuDS Approving Body (SAB) to be set up within Lead Local Flood Authorities (LLFAs). The responsibilities of the SAB can be delegated to other organisations, such as the local planning authority, but the legal responsibility for drainage matters remains with the LLFA.

Schedule 3 requires the inclusion of sustainable drainage of surface water in developments that require planning approval or have drainage implications. It removes the automatic right, established by the Water Industry Act, to connect to public sewers and instead gives powers to local authorities as SABs to approve new drainage systems and their connection to public sewers. SABs will assess proposed SuDS in accordance with a new National Standard. The National Standard has yet to be published in its final form, but it will address the design, construction, maintenance and operation of drainage systems. It is likely to consider run-off destination, peak flow rates, volume and water quality.

The National SuDS standards will consider drainage impacts as a result of changing rainfall intensity due to climate change, and thus will promote adaptation to future surface water flooding risks.

The introduction of these measures has been delayed several times and in September 2014 Defra released a public consultation document proposing that the approval of SuDS drainage systems should be undertaken via the planning system, and outlining various options for maintenance of SuDS including by water companies and by independent management companies⁶. Therefore it is possible that approval for SuDS systems will become a responsibility of Local Planning Authorities in the near future.

⁶ Defra (2014) Delivering Sustainable Drainage Systems.

<https://consult.defra.gov.uk/water/delivering-sustainable-drainage-systems>

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3 Potential development area flood risk summary sheets

3.1 Introduction

The following sections include summaries for each new housing site to be allocated in the Vale Local Plan. The information given is based on national and detailed mapping provided by the Environment Agency, and local evidence provided by the Councils.

The following points should be noted when interpreting the maps shown:

- Flood Zone 3a and Flood Zone 2 are based on the national mapping provided by the Environment Agency.
- Flood Zone 3b is based on the 20 year flood extent where there is detailed model information. Where no detailed information is available, Flood Zone 3a is used as a precautionary approach. See section 3.2 for flood map outline revisions.
- Flood Zone 3a with climate change is based on the 100 year plus climate change flood extent where there is detailed model information. Where no detailed information is available, Flood Zone 2 is used as a precautionary approach.
- The Flood Map for Surface Water (FMfSW) is shown on a 1:10,000 map background at a 1:10,000 scale (or smaller), as recommended by the Environment Agency.
- The Areas Susceptible to Groundwater Flooding (AStGWF) map is very broad-scale and has not been shown for individual sites. It can be viewed in Map 6 of the 2013 SFRA.

3.2 Flood Mapping Revisions

Figure 3-1 and Figure 3-2 show the new Flood Zone 3b, which incorporates recent changes to the functional flood plain due to remodelling of the Thames (Eynsham to Sandford) producing 2014 updated model outlines. This caused a revision to a 1 in 20 year from a 1 in 25 year functional floodplain, as per the previously published SFRA. Although there are many notable changes, these are only minor in the VoWH. The maps can be seen at a larger scale in Appendix A.

Figure 3-1: The new 1 in 20 year functional flood plain between Eynsham and Sandford

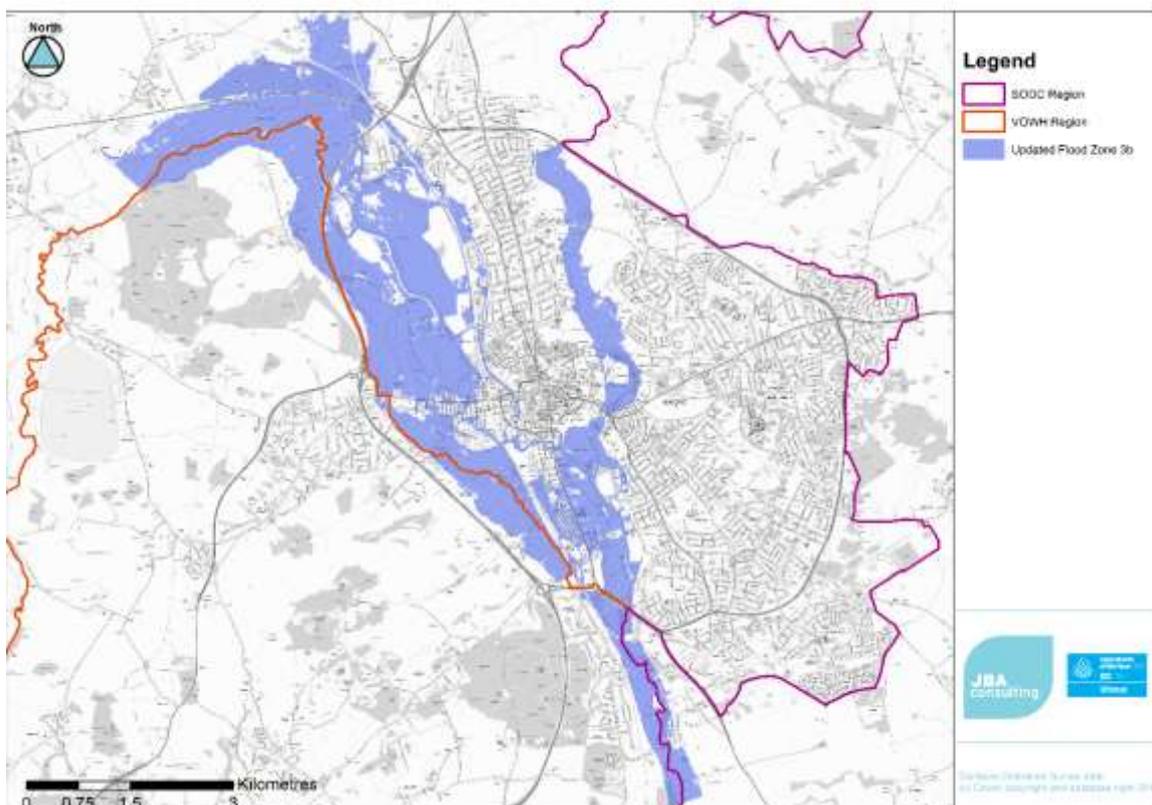
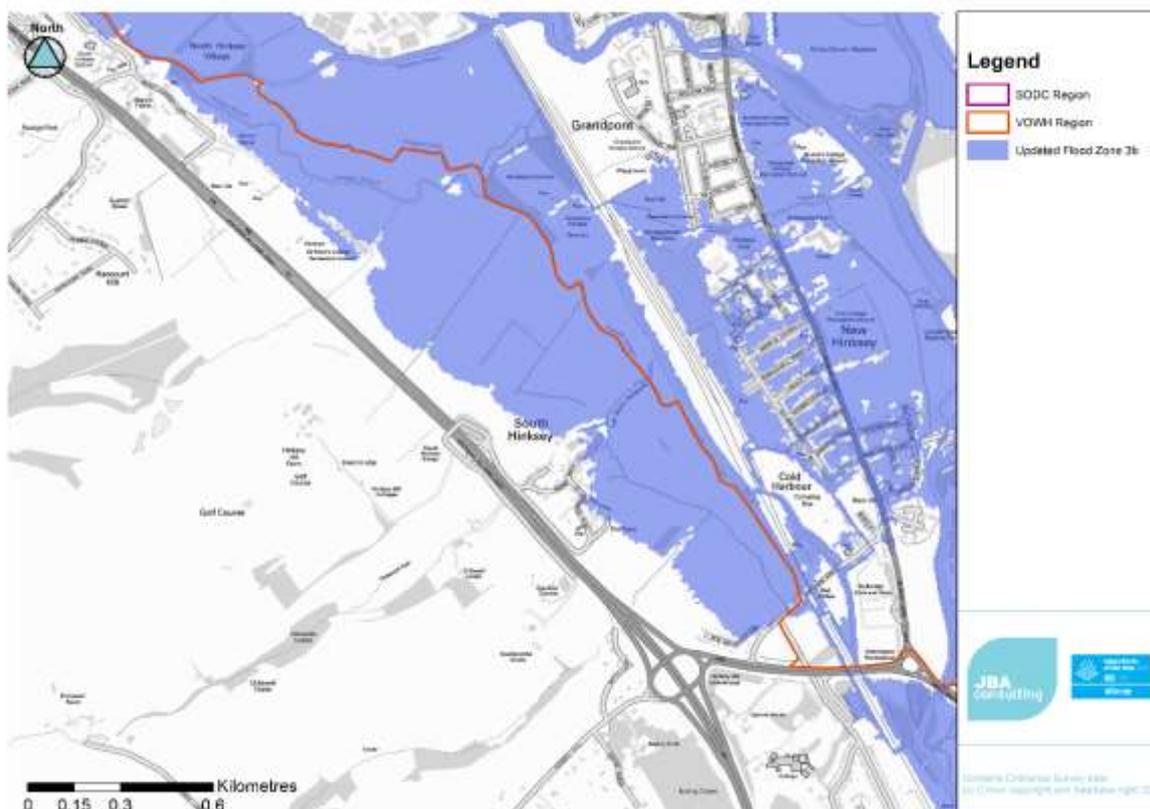


Figure 3-2: The new 1 in 20 year functional flood plains at South Hinksey



3.3 New Sites

The new sites to be allocated in the Vale Local Plan are shown in Table 3-1 (final list of sites confirmed on 12/09/14).

Table 3-1: Final list of sites to be allocated in the Vale Local Plan

Site No.	Location of Site	Area of site (ha)	Number of units proposed
1	North West Abingdon	8.13	200
2	North Abingdon	53.82	800
3	South Kennington	11.79	270
4	North West Radley	12.15	240
5	East Sutton Courtenay	8.83	220
6	Kingston Bagpuize East	11.85	280
7	Milton Heights	15.81	400
8	Valley Park	180.73	2550
9	North West Valley Park	38.58	800
10	West of Harwell	8.57	200
11	East of Harwell Campus	61.74	850
12	North of Harwell Campus	18.93	550
13	East Hanney	8.20	200
14	Crab Hill Wantage	98.71	1500
15	Monks Farm, Grove	56.70	750
16	Land South of Park Road, Faringdon	27.85	350
17	Stanford in the Vale	11.62	200
18	South Faringdon, (Parish of Great Coxwell)	18.35	200
19	SW Faringdon	10.47	200
20	North Shrivenham	31.47	500
21	East of Coxwell Road, Faringdon	8.00	200

3.4 Vale of White Horse - Housing Sites

3.4.1 North West Abingdon

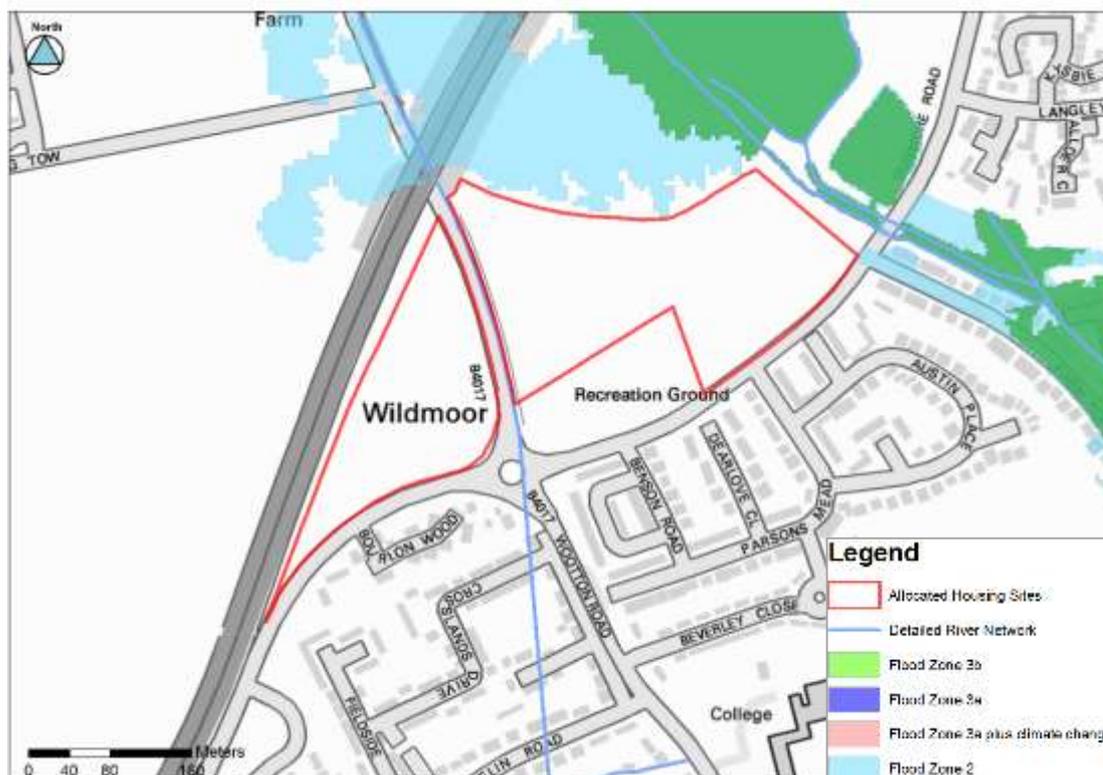
North West Abingdon			
Area: 8.13ha	Brownfield/greenfield: Greenfield	Proposed use: Residential - 200 houses	Flood risk vulnerability classification: More vulnerable/less vulnerable

Summary of flood risk to site

Fluvial

Flood Zones 2 and 3 are immediately adjacent to the site to the north and east. There are no flood defences.

Flood Zone map

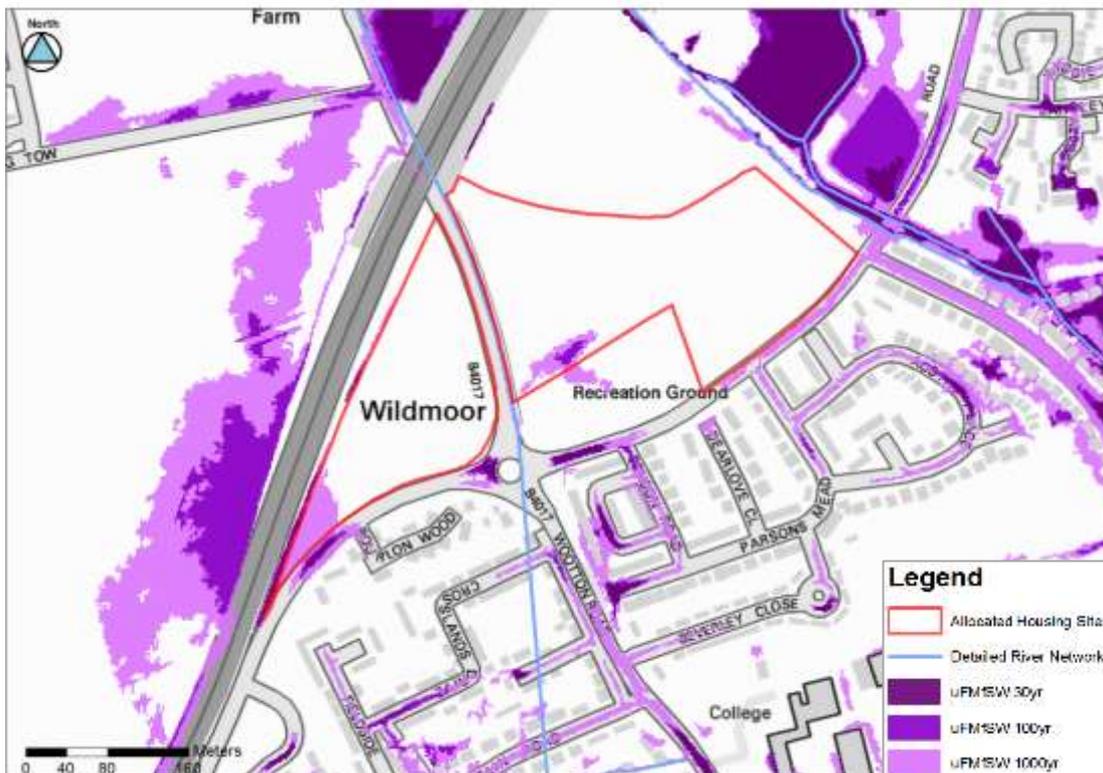


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Surface water

The uFMfSW shows a potential ponding in the southern extents o the sites. No local evidence to support this.

Flood Map for Surface Water



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Groundwater

The AStGWF map suggests the area is mostly in the medium category of risk of groundwater flood emergence, with some in the lowest category. No historical record of groundwater flooding.

Sewer

No known sewer flooding problems.

Effects of climate change

Increased rainfall intensity in the future may exacerbate any surface water flooding problems.

Available survey/detailed modelling

No detailed models available.

Implications for development

- Requires a full FRA for a site >1ha in Flood Zone 1.
- Drainage strategy should be submitted at an early stage to cover mitigation of any surface water risk and reduce impact downstream through site design and SuDS methods.
- Thames Water should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.

3.4.2 North Abingdon

North Abingdon			
Area: 53.82 ha	Brownfield/greenfield: Greenfield	Proposed use: Residential - 800 houses	Flood risk vulnerability classification: More vulnerable/less vulnerable

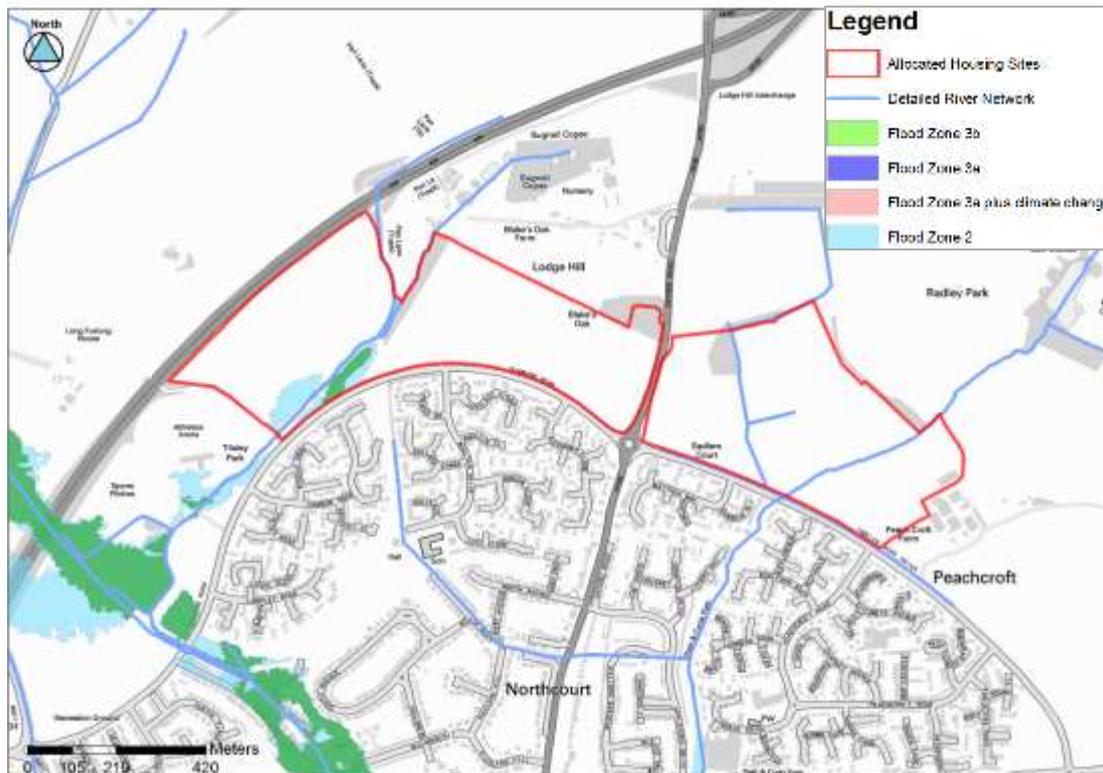
Summary of flood risk to site

Fluvial

The site is in Flood Zone 3 and 2 where a small watercourse flows through the site from north to south. Two other watercourses, including the main river Radley Park Ditch, flow through the eastern part of the site.

There are no flood defences.

Flood Zone map

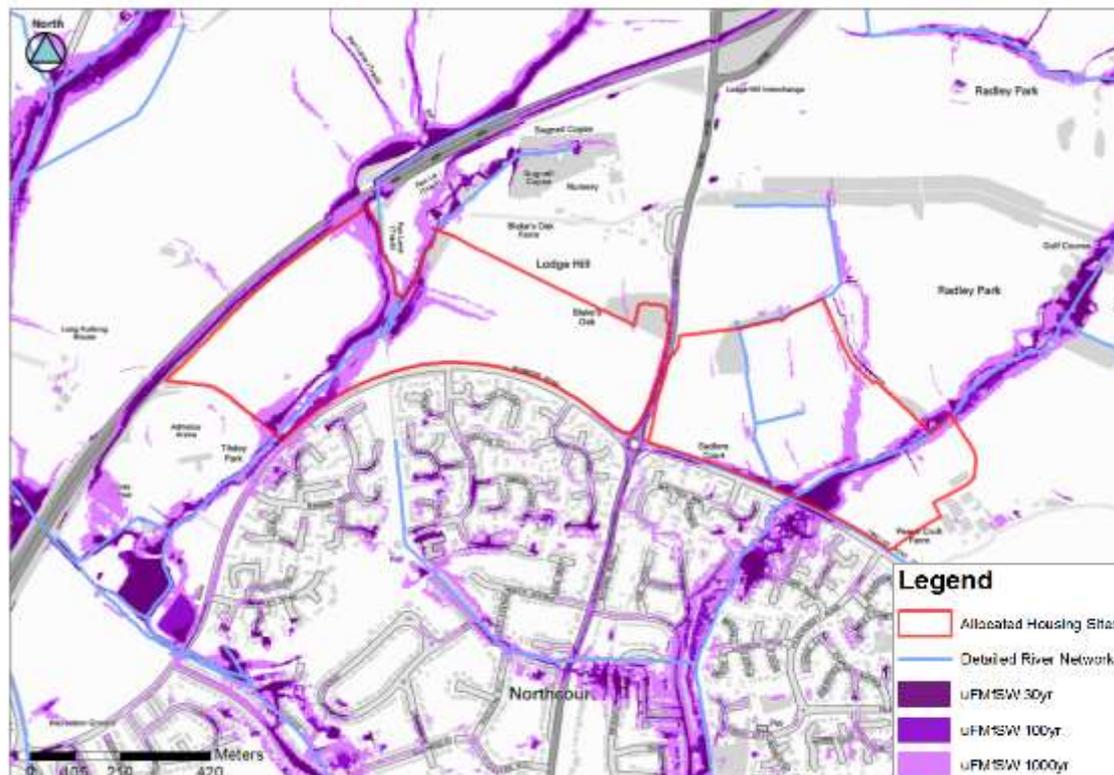


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Surface water

The uFMfSW shows two potential flow paths at the east and west of the site, and other small areas of ponding. No local evidence to support this.

Flood Map for Surface Water



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Groundwater

The ASStGWf map suggests the area is mostly in the lowest category of risk of groundwater flood emergence. No historical record of groundwater flooding.

Sewer

No known sewer flooding problems.

Effects of climate change

Increased rainfall intensity in the future may exacerbate any surface water flooding problems.

Available survey/detailed modelling

No detailed models available.

Implications for development

- Requires a full FRA for a site in Flood Zone 2, 3 and >1 ha in Flood Zone 1.
- The FRA should demonstrate that the development will not be at risk from the small watercourses crossing the site, taking into account the effects of potential blockage of the culverts, though detailed modelling if necessary. The location of existing drains and watercourses should be preserved.
- FRA should include a detailed assessment of groundwater flood risk.
- It must be demonstrated that the site will be designed sequentially ensuring all development will be outside of Flood Zone 2 with climate change, and any flood risk areas or flow routes defined by modelling of small watercourses and groundwater investigation.
- It must be demonstrated that safe, dry access and egress will be available during a severe flood event.
- Drainage strategy should be submitted at an early stage to cover mitigation of any surface water risk and reduce impact downstream through site design and SuDS methods.
- Thames Water should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.

3.4.3 South Kennington

South Kennington			
Area: 11.79 ha	Brownfield/greenfield: Greenfield	Proposed use: Residential - 270 houses	Flood risk vulnerability classification: More vulnerable/less vulnerable

Summary of flood risk to site

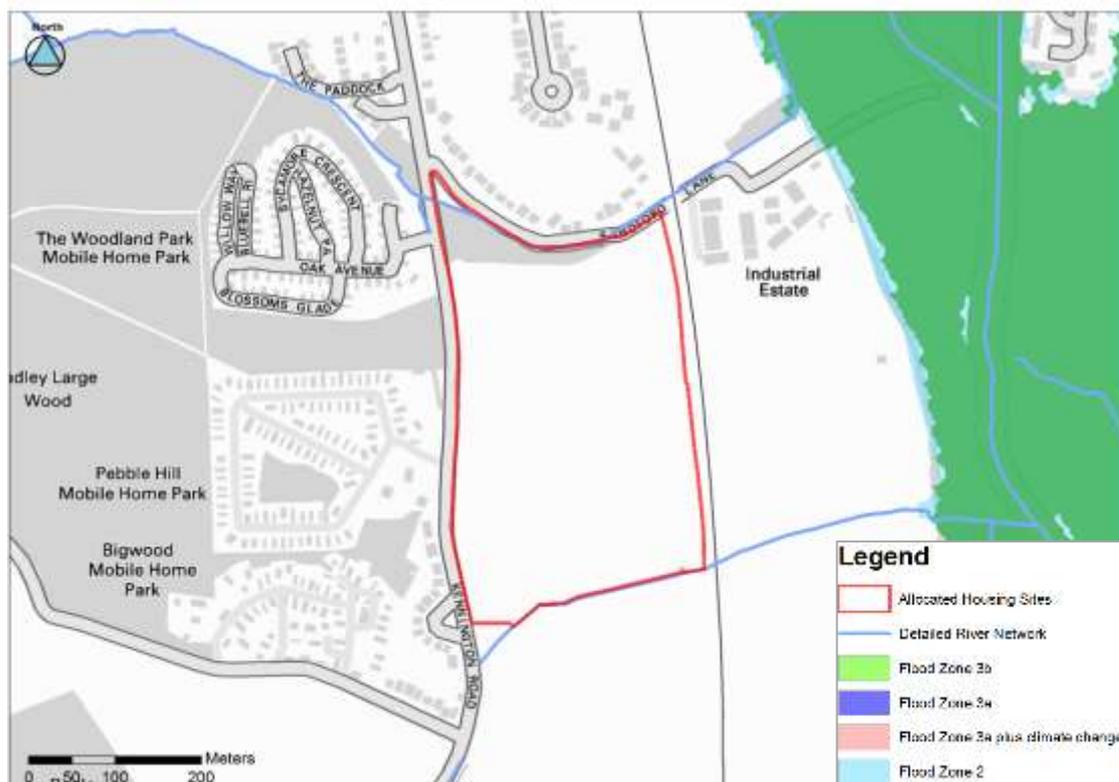
Fluvial

A partially culverted watercourse flows on the southern side of the road at the northern boundary of the site. Two small watercourses exist on the northern and southern boundaries of the site. A watercourse flows on the southern boundary of the site.

There is no known risk from fluvial flooding.

There are no flood defences.

Flood Zone map

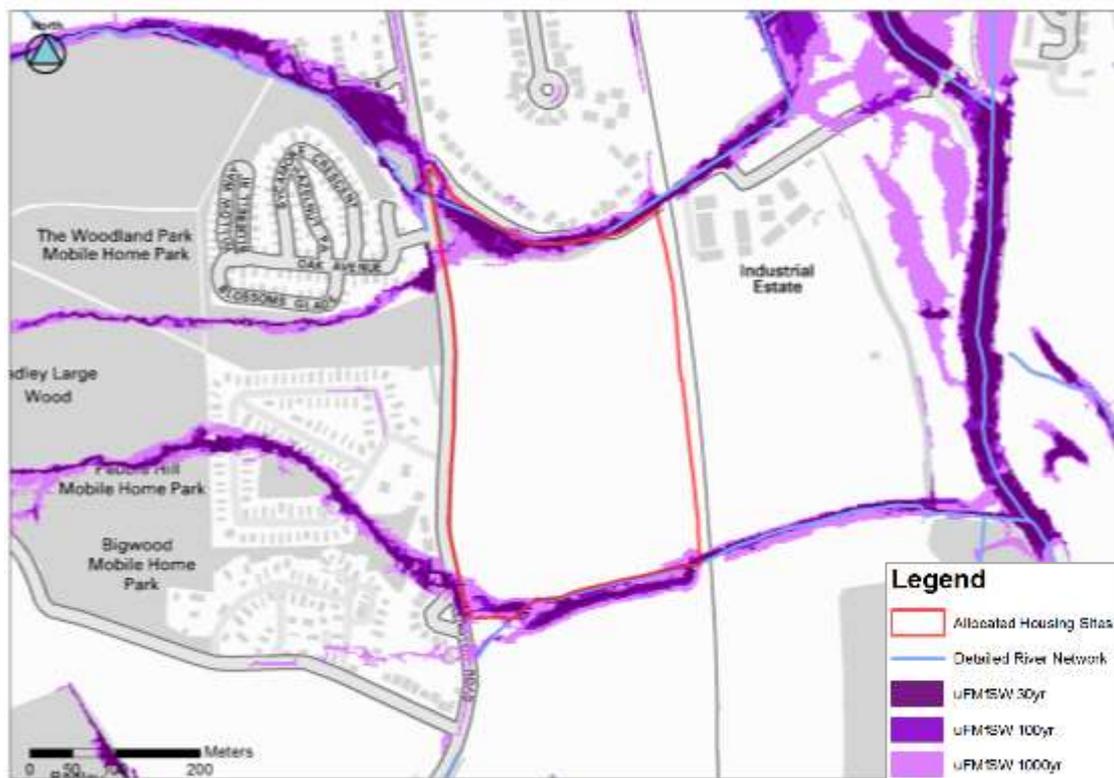


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Surface water

The uFMfSW shows potential flow paths along the northern and southern borders of the site. These denote the line of minor watercourses which are too small to be represented in the fluvial Flood Zones.

Flood Map for Surface Water



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Groundwater

The AStGWF map suggests the area is in the low risk category (25%-50%) of risk of groundwater flood emergence. No historical record of groundwater flooding.

Sewer

No known sewer flooding problems.

Effects of climate change

Increased rainfall intensity in the future may exacerbate any surface water flooding problems.

Available survey/detailed modelling

No detailed models available.

Implications for development

- Requires a full FRA for a site >1ha in Flood Zone 1.
- Drainage strategy should be submitted at an early stage to cover mitigation of any surface water risk and reduce impact downstream through site design and SuDS methods.
- Thames Water should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.

3.4.4 North West Radley

North West Radley			
Area: 12.15 ha	Brownfield/greenfield: Greenfield	Proposed use: Residential - 240 houses	Flood risk vulnerability classification: More vulnerable/less vulnerable

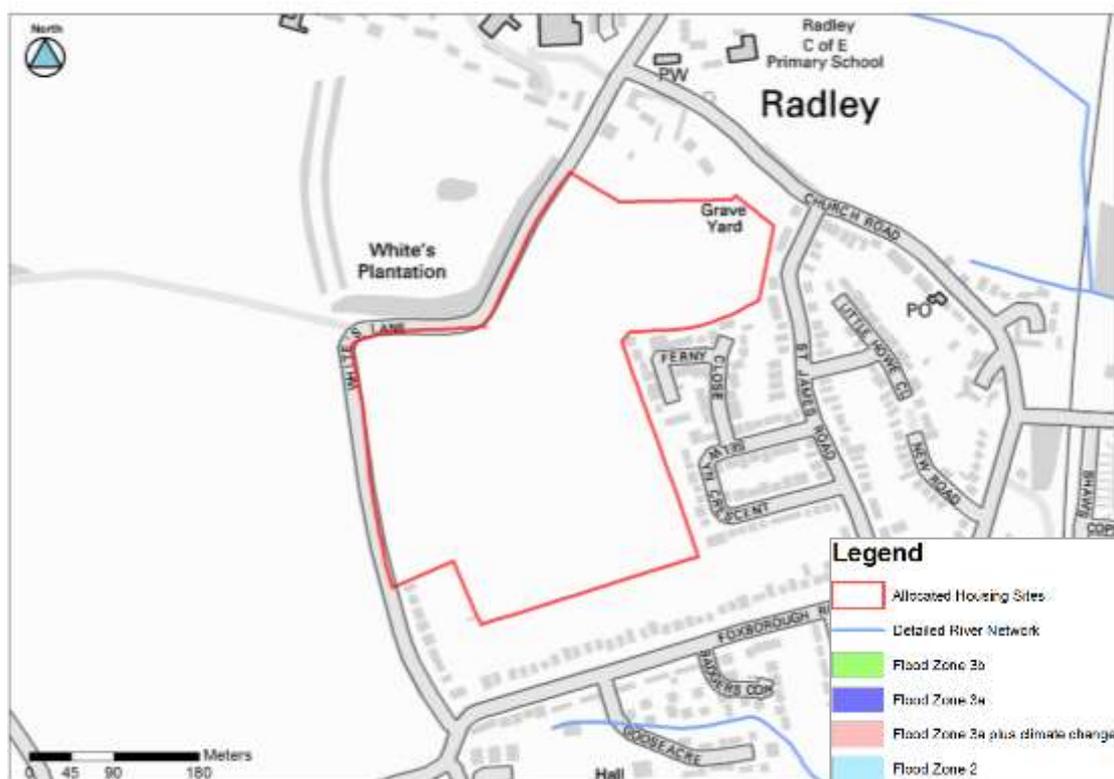
Summary of flood risk to site

Fluvial

There is no known risk from fluvial flooding.

There are no flood defences.

Flood Zone map

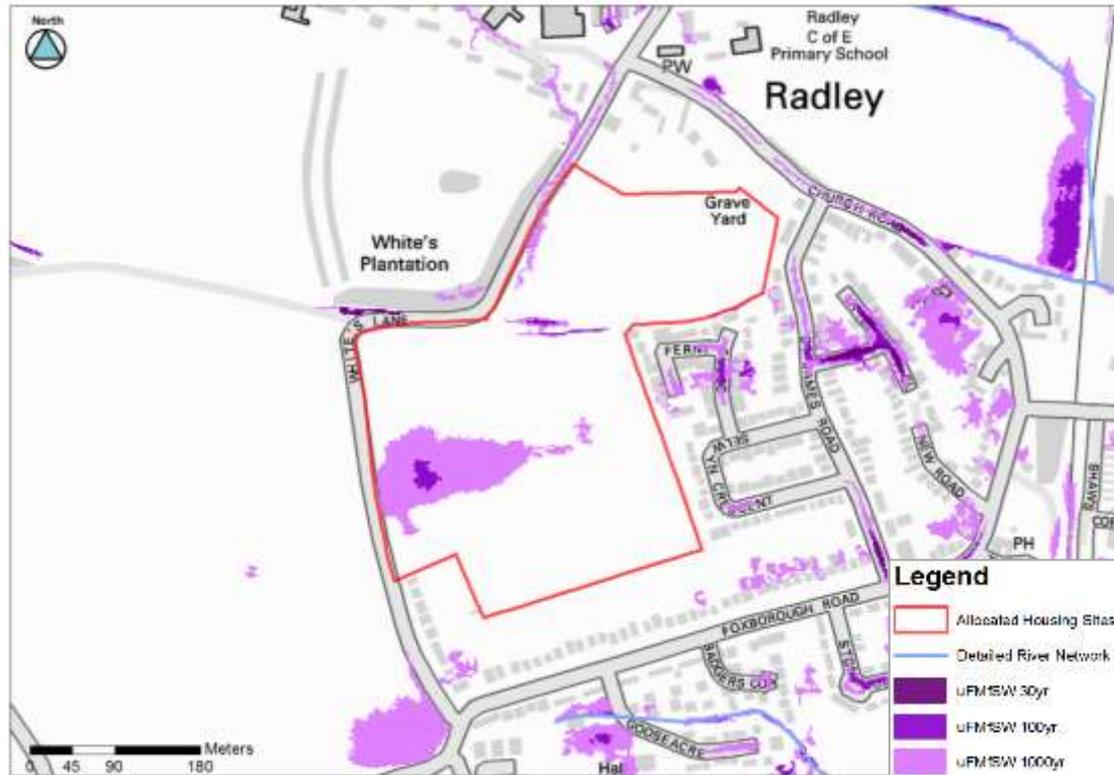


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Surface water

The uFMfSW show a large area of ponding to the west of the site, however this is for infrequent events (100yr and 1000yr) and other small areas of ponding. No local evidence to support this.

Flood Map for Surface Water



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Groundwater

The AStGWF map suggests the area is mostly in the high and medium risk category of groundwater flood emergence, however no historical record of groundwater flooding.

Sewer

No known sewer flooding problems.

Effects of climate change

Increased rainfall intensity in the future may exacerbate any surface water flooding problems.

Available survey/detailed modelling

No detailed models available.

Implications for development

- Requires a full FRA for a site >1ha in Flood Zone 1.
- Drainage strategy should be submitted at an early stage to cover mitigation of any surface water risk and reduce impact downstream through site design and SuDS methods.
- Thames Water should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.

3.4.5 East Sutton Courtenay

East Sutton Courtenay			
Area: 8.83 ha	Brownfield/greenfield: Greenfield	Proposed use: Residential - 220 houses	Flood risk vulnerability classification: More vulnerable/less vulnerable

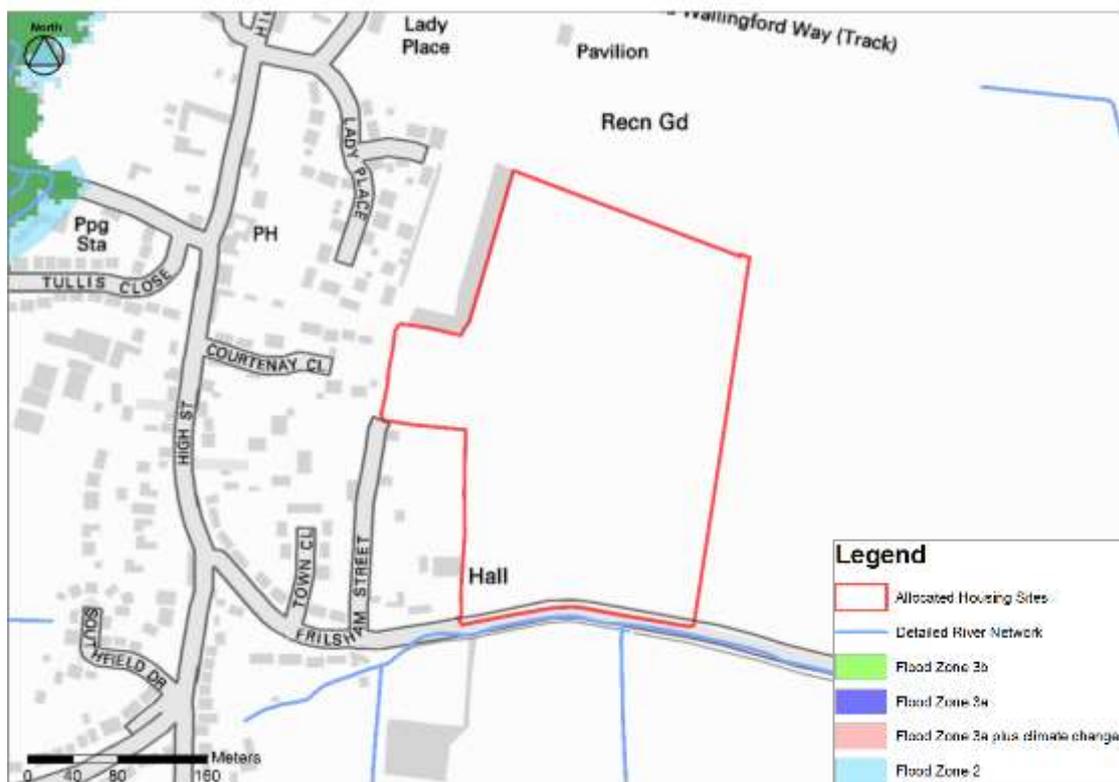
Summary of flood risk to site

Fluvial

A watercourse runs along the south side of the road to the south of the site, however there is no Flood Zone mapping for this watercourse.

There are no flood defences.

Flood Zone map

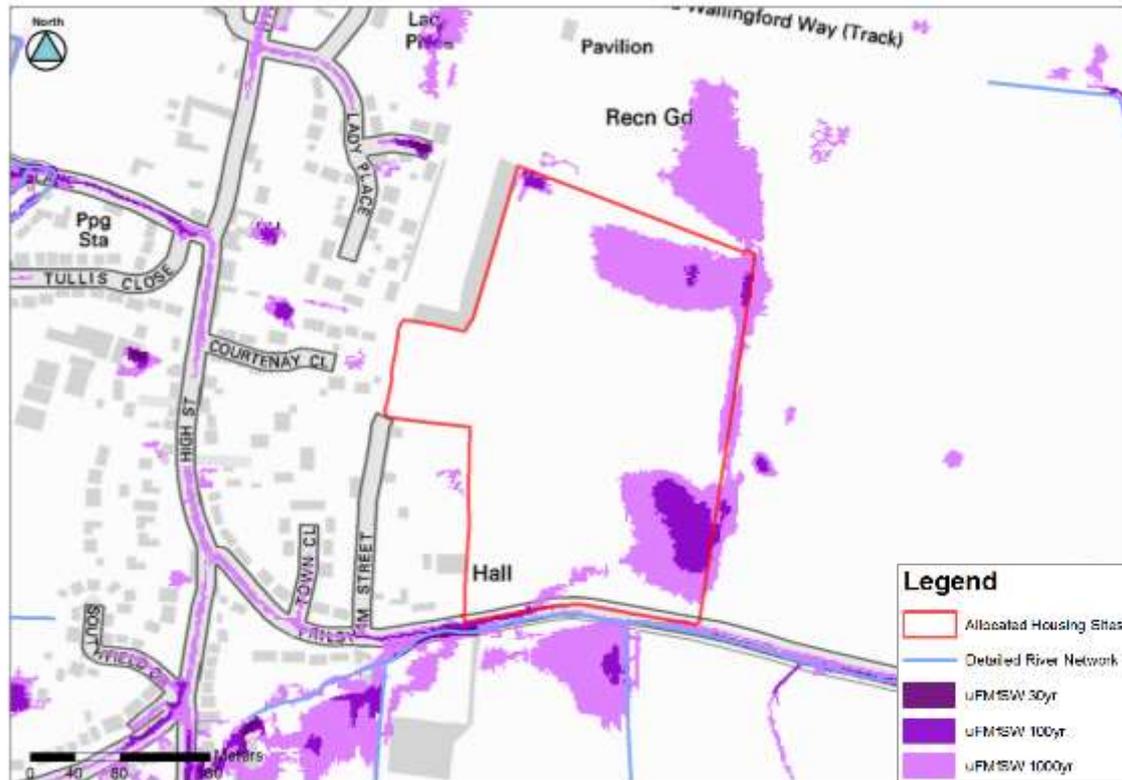


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Surface water

The uFMfSW shows risk of surface water flooding for a 100 or 1000 year event. No local evidence to support this.

Flood Map for Surface Water



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Groundwater

The AStGWF map suggests that most of the area is in the highest category of risk of groundwater flood emergence. No historical record of groundwater flooding.

Sewer

No known sewer flooding problems.

Effects of climate change

Increased rainfall intensity in the future may exacerbate any surface water flooding problems.

Available survey/detailed modelling

No detailed models available.

Implications for development

- Requires a full FRA for a site >1ha in Flood Zone 1.
- Drainage strategy should be submitted at an early stage to cover mitigation of any surface water risk and reduce impact downstream through site design and SuDS methods.
- Thames Water should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.

3.4.6 Kingston Bagpuize East

Kingston Bagpuize East			
Area: 11.85 ha	Brownfield/greenfield: Greenfield	Proposed use: Residential - 280 houses	Flood risk vulnerability classification: More vulnerable/less vulnerable

Summary of flood risk to site

Fluvial

A watercourse is present to the north of the A420.
 There is no known risk from fluvial flooding.
 There are no flood defences.

Flood Zone map

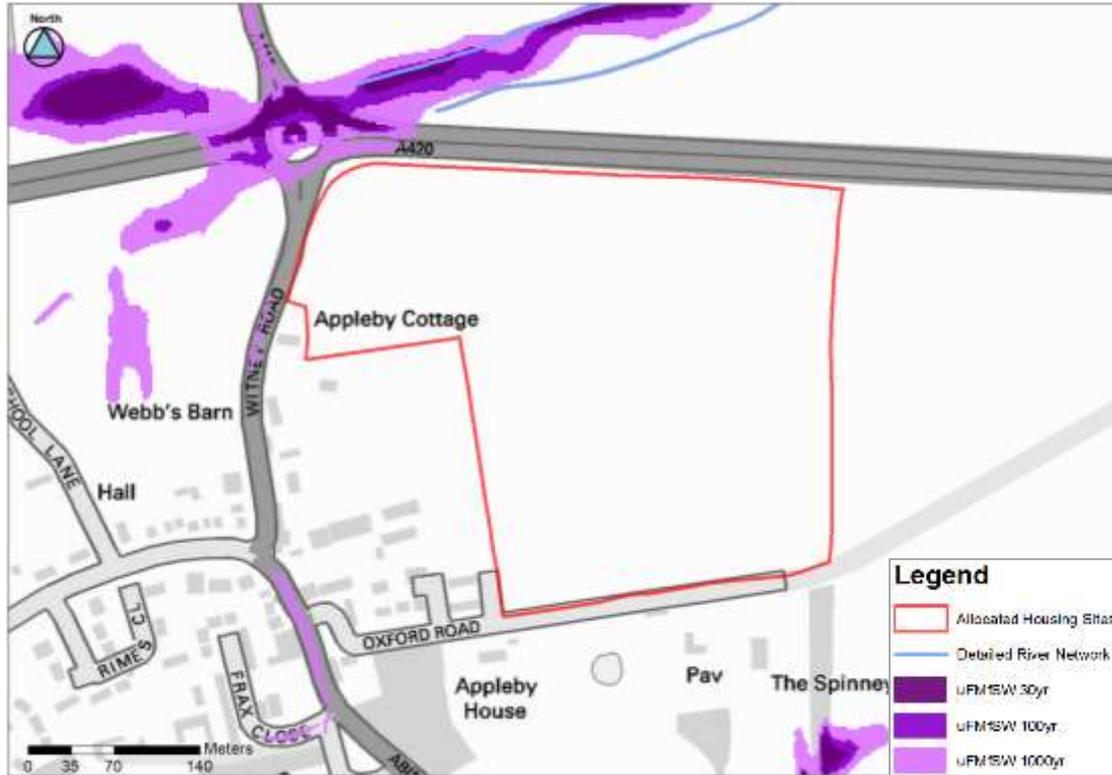


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Surface water

The uFMfSW shows no surface water flooding on the site. Some surface water flooding exists from the small watercourse to the north west. There is an early medieval boundary ditch on the eastern boundary of this site. It is likely that this will be required to be retained for drainage and/or archaeological value with a suitable buffer zone if retained.

Flood Map for Surface Water



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Groundwater

The AStGWF map suggests the area is mostly in the low and lowest categories of risk of groundwater flood emergence. No historical record of groundwater flooding.

Sewer

No known sewer flooding problems.

Effects of climate change

Increased rainfall intensity in the future may exacerbate any surface water flooding problems.

Available survey/detailed modelling

No detailed models available.

Implications for development

- Requires a full FRA for a site >1ha in Flood Zone 1.
- Drainage strategy should be submitted at an early stage to cover mitigation of any surface water risk and reduce impact downstream through site design and SuDS methods.
- Thames Water should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.

3.4.7 Milton Heights

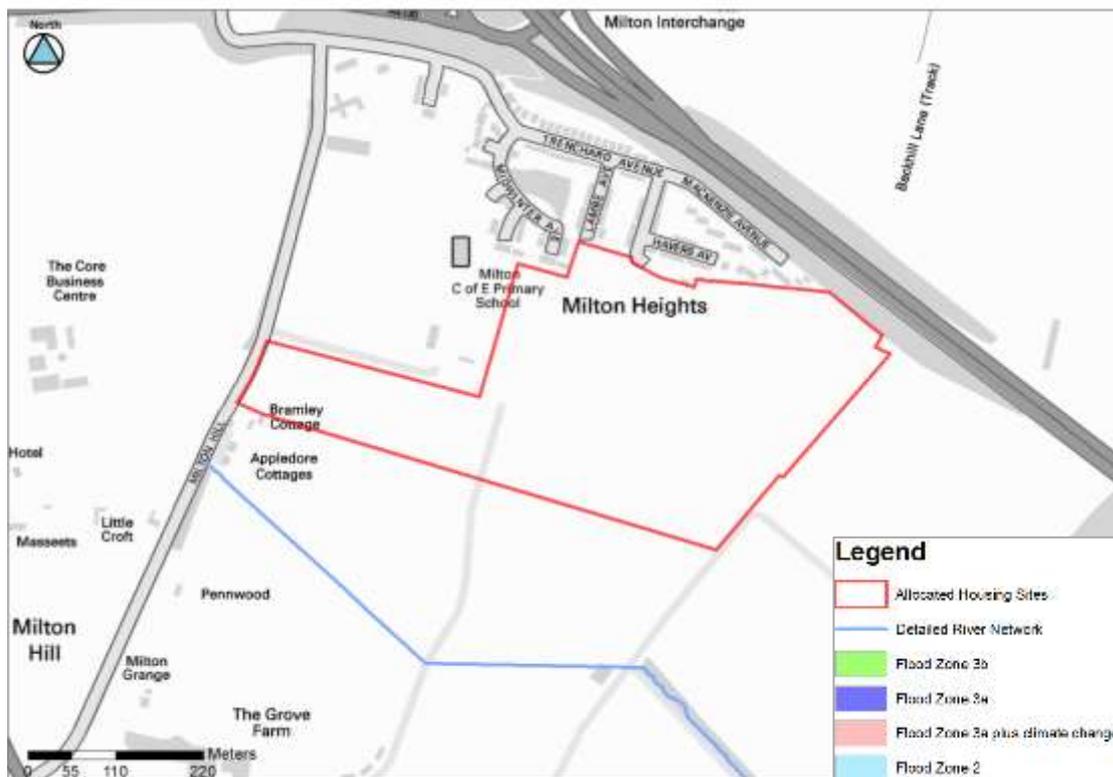
Milton Heights			
Area: 15.81 ha	Brownfield/greenfield: Greenfield	Proposed use: Residential - 400 houses	Flood risk vulnerability classification: More vulnerable/less vulnerable

Summary of flood risk to site

Fluvial

One partially culverted watercourse flows west to the east at the south of the site. There is no known risk from fluvial flooding. There are no flood defences.

Flood Zone map

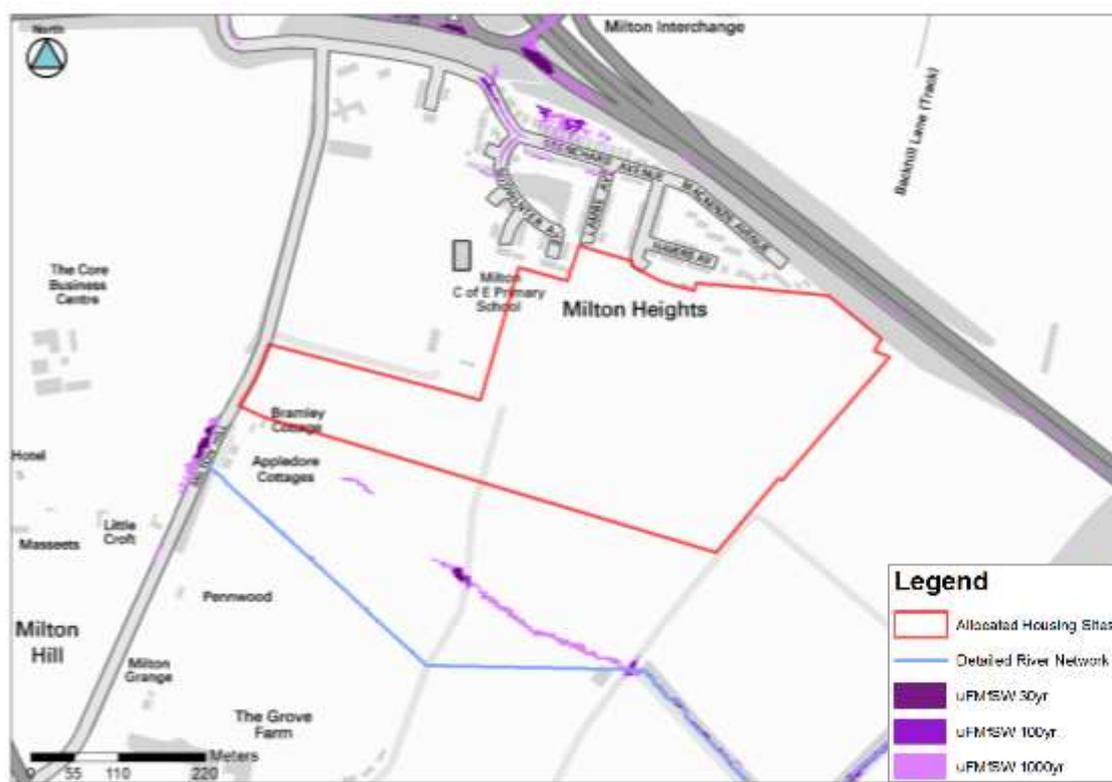


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Surface water

The uFMfSW shows no risk of surface water flooding within the site boundary, however some minor flow paths exist from the watercourse to the south of the site. Surface water flooding has been recorded in 2007 and 2009 to affect properties in Havers Avenue from overland runoff from the proposed site.

Flood Map for Surface Water



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Groundwater

The AStGWF map suggests the area is mostly in a low category (25-50%) of risk of groundwater flood emergence. No historical record of groundwater flooding.

Sewer

No known sewer flooding problems.

Effects of climate change

Increased rainfall intensity in the future may exacerbate any surface water flooding problems.

Available survey/detailed modelling

No detailed models available.

Implications for development

- Requires a full FRA for a site >1ha in Flood Zone 1.
- Drainage strategy should be submitted at an early stage to cover mitigation of any surface water risk and reduce impact downstream through site design and SuDS methods.
- Thames Water should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.
- As surface water flooding has previously affected properties in Havers Avenue from overland runoff from the proposed site, the FRA should demonstrate how the site drainage will be managed to reduce risk downstream when compared to the existing situation.

3.4.8 Valley Park

Valley Park was originally assessed in the full SFRA. As changes have been made to the boundary of the site since the SFRA was completed, the site has been reassessed.

Valley Park			
Area: 180.73 ha	Brownfield/greenfield: Greenfield	Proposed use: Residential - 2550 houses	Flood risk vulnerability classification: More vulnerable/less vulnerable

Summary of flood risk to site

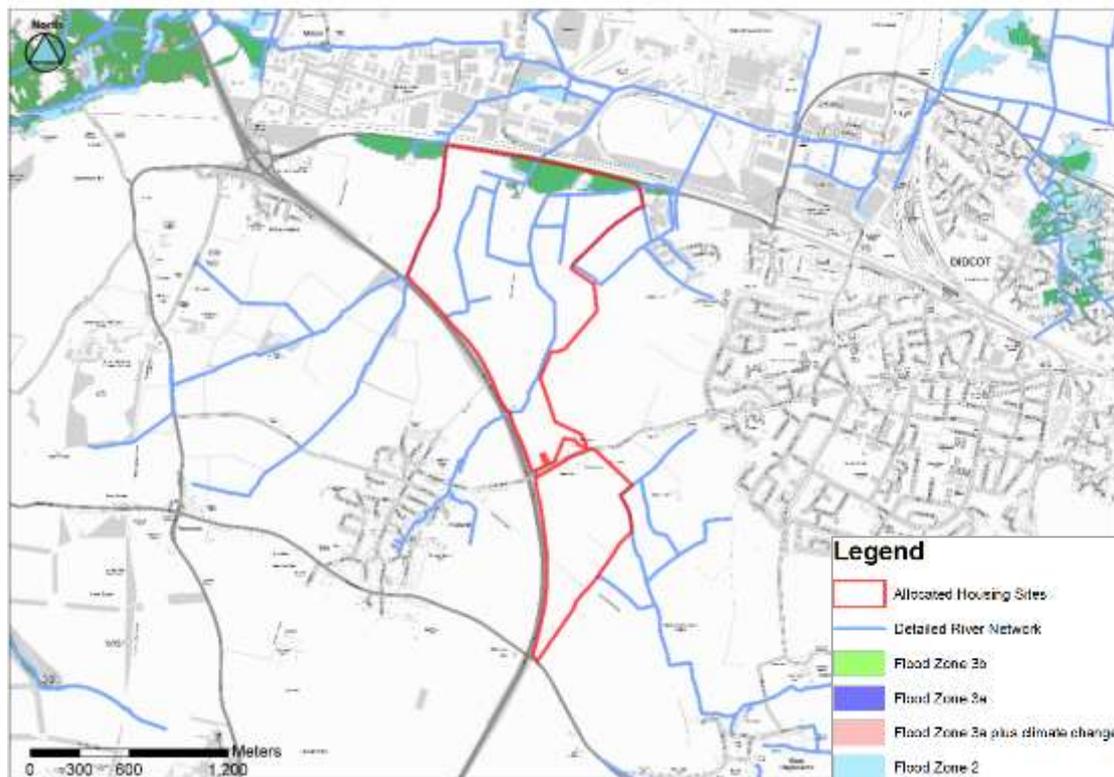
Fluvial

Small area to the north of the site is at risk from fluvial flooding from tributaries of Moor Ditch (Flood Zone 3 and 2). There are a number of minor watercourses crossing the site from south to north and entering Moor Ditch, that are not included in the Flood Zones.

There are no flood defences.

The watercourses enter three long culverts under Milton Road, the railway and the industrial area around Didcot Power Station.

Flood Zone map

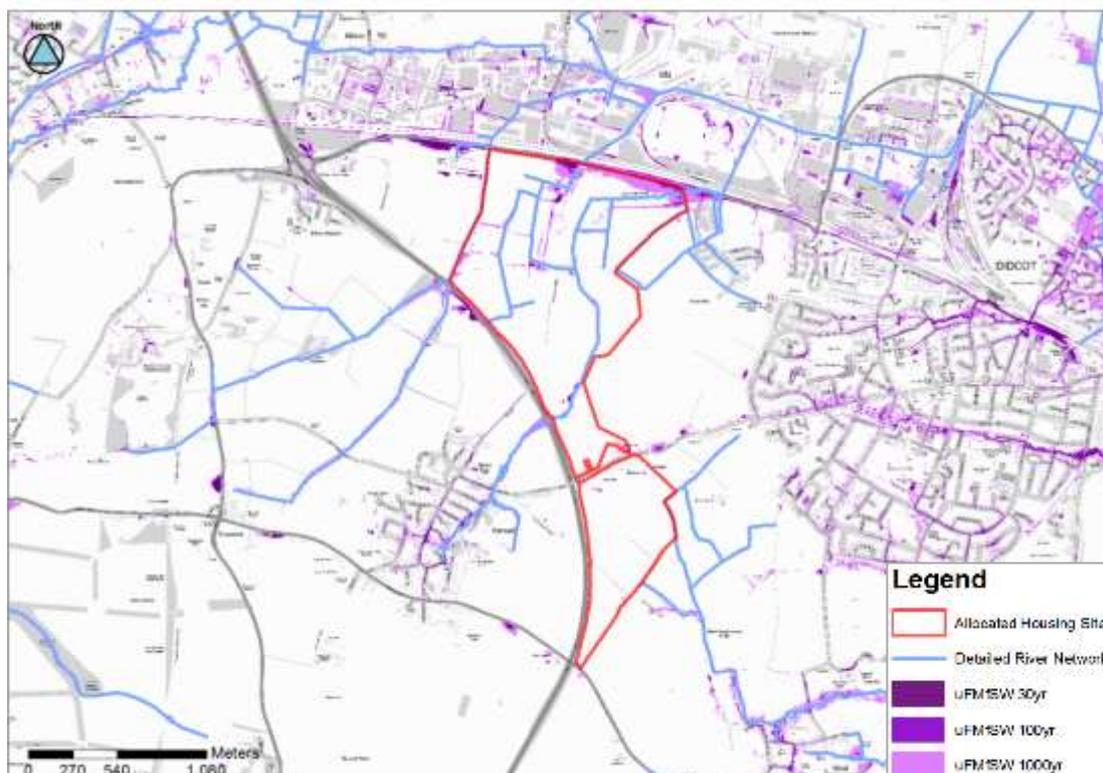


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Surface water

The uFMfSW shows significant potential flow paths across site. No local historical evidence was found but presence of small watercourses supports this assessment.

Flood Map for Surface Water



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Groundwater

The AstGWF map suggests the area is at medium to high risk of groundwater flood emergence at the north of the site, with risk decreasing towards the southern part of the site. No historical record of groundwater flooding.

Sewer

No known sewer flooding problems.

Effects of climate change

Climate change is unlikely to increase the fluvial flood extent significantly (there is little difference between the different zones).

Increased rainfall intensity in the future may exacerbate flooding from surface water and small watercourses.

Wetter winters may increase groundwater flood risk.

Available survey/detailed modelling

The following detailed model has been used in the Flood Map:

- Moor Ditch (HR Wallingford, 2007)

Implications for development

- The area at risk of fluvial flooding was initially excluded from the site but discussions with the Environment Agency concluded that it would be more beneficial to enhance the amenity value of this land as part of the development. It has been included on the understanding that the built development will all be within Flood Zone 1.
- Requires a full FRA for a site in Flood Zone 2, 3 and >1 ha in Flood Zone 1.
- The FRA should demonstrate that the development will not be at risk from the small watercourses crossing the site, taking into account the effects of potential blockage of the culverts, though detailed modelling if necessary. The location of existing drains and watercourses should be preserved.
- FRA should include a detailed assessment of groundwater flood risk.
- It must be demonstrated that the site will be designed sequentially ensuring all development

will be outside of Flood Zone 2 with climate change, and any flood risk areas or flow routes defined by modelling of small watercourses and groundwater investigation.

- It must be demonstrated that safe, dry access and egress will be available during a severe flood event.
- Opportunities for enhancing the amenity value of the Flood Zone area.
- Drainage strategy should be submitted at an early stage to cover mitigation of any surface water risk and reduce impact downstream through site design and SuDS methods.
- Thames Water should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.

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3.4.9 North West Valley Park

North West Valley Park			
Area: 38.58 ha	Brownfield/greenfield: Greenfield	Proposed use: Residential - 800 houses	Flood risk vulnerability classification: More vulnerable/less vulnerable

Summary of flood risk to site

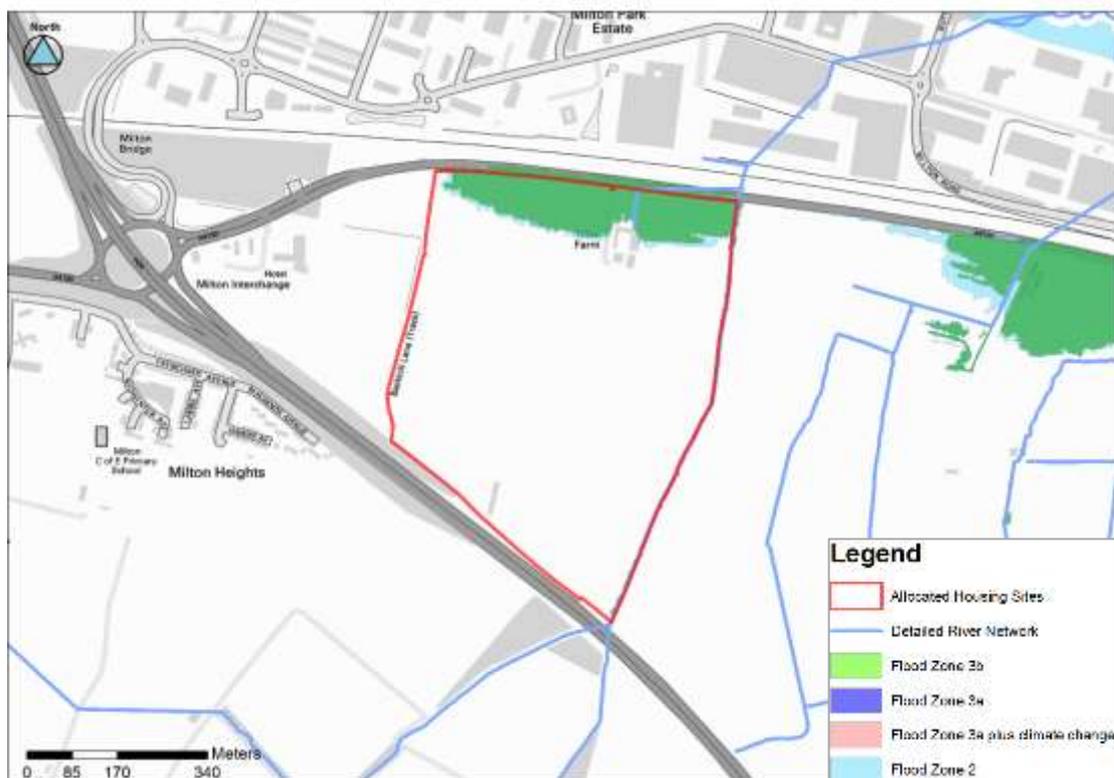
Fluvial

Small area to the north of the site is at risk from fluvial flooding from tributaries of Moor Ditch (Flood Zone 3 and 2). There is a minor watercourse flowing from south to north at the east of the site at the boundary of the Valley Park site, this is not included in the Flood Zones.

There are no flood defences.

The watercourses enters a culvert under Milton Road.

Flood Zone map

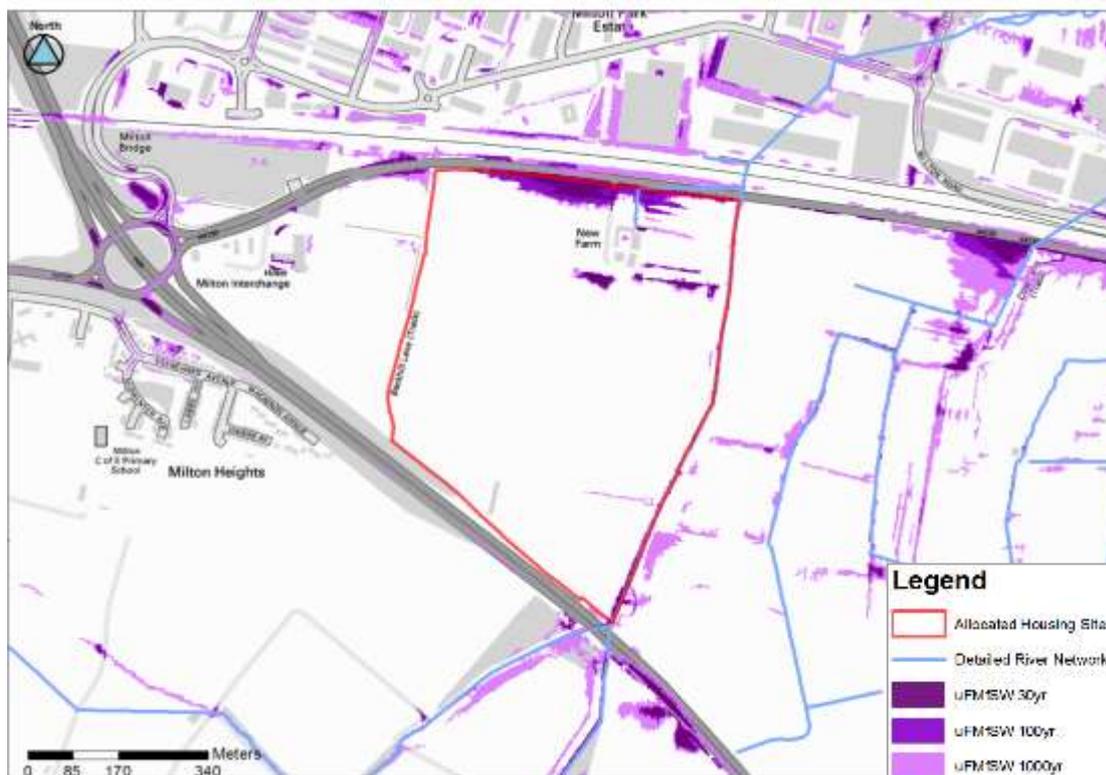


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Surface water

The uFMfSW shows significant potential flow paths across the north of the site. No local historical evidence was found but presence of small watercourses supports this assessment.

Flood Map for Surface Water



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Groundwater

The AStGWF map suggests the area is mostly in the highest category of risk of groundwater flood emergence, however no historical record of groundwater flooding.

Sewer

No known sewer flooding problems.

Effects of climate change

Increased rainfall intensity in the future may exacerbate any surface water flooding problems.

Available survey/detailed modelling

The following detailed model has been used in the Flood Map:

- Moor Ditch (HR Wallingford, 2007)

Implications for development

- Requires a full FRA for a site in Flood Zone 2, 3 and >1 ha in Flood Zone 1.
- The FRA should demonstrate that the development will not be at risk from the small watercourses crossing the site, taking into account the effects of potential blockage of the culverts, though detailed modelling if necessary. The location of existing drains and watercourses should be preserved.
- FRA should include a detailed assessment of groundwater flood risk.
- It must be demonstrated that the site will be designed sequentially ensuring all development will be outside of Flood Zone 2 with climate change, and any flood risk areas or flow routes defined by modelling of small watercourses and groundwater investigation.
- It must be demonstrated that safe, dry access and egress will be available during a severe flood event.
- Drainage strategy should be submitted at an early stage to cover mitigation of any surface water risk and reduce impact downstream through site design and SuDS methods.
- Thames Water should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.

3.4.10 West of Harwell

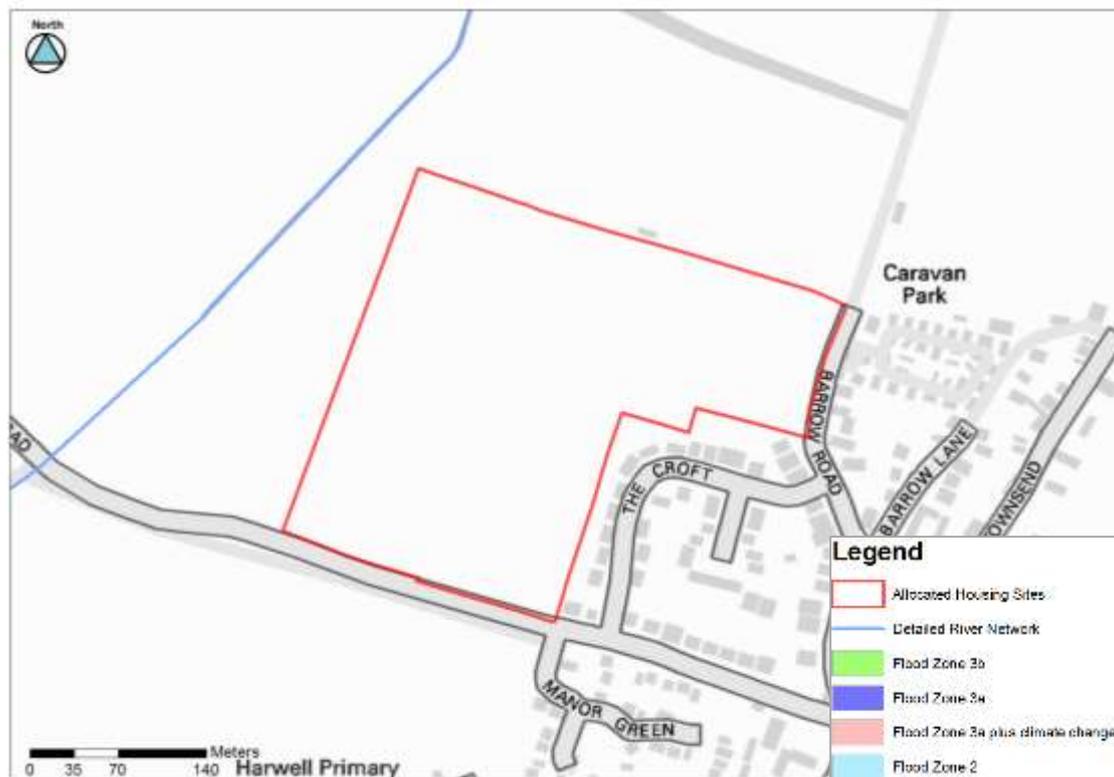
West of Harwell			
Area: 8.57 ha	Brownfield/greenfield: Greenfield	Proposed use: Residential - 200 houses	Flood risk vulnerability classification: More vulnerable/less vulnerable

Summary of flood risk to site

Fluvial

A partially culverted watercourse flows from the south west to the north of the site. There is no known risk from fluvial flooding. There are no flood defences.

Flood Zone map

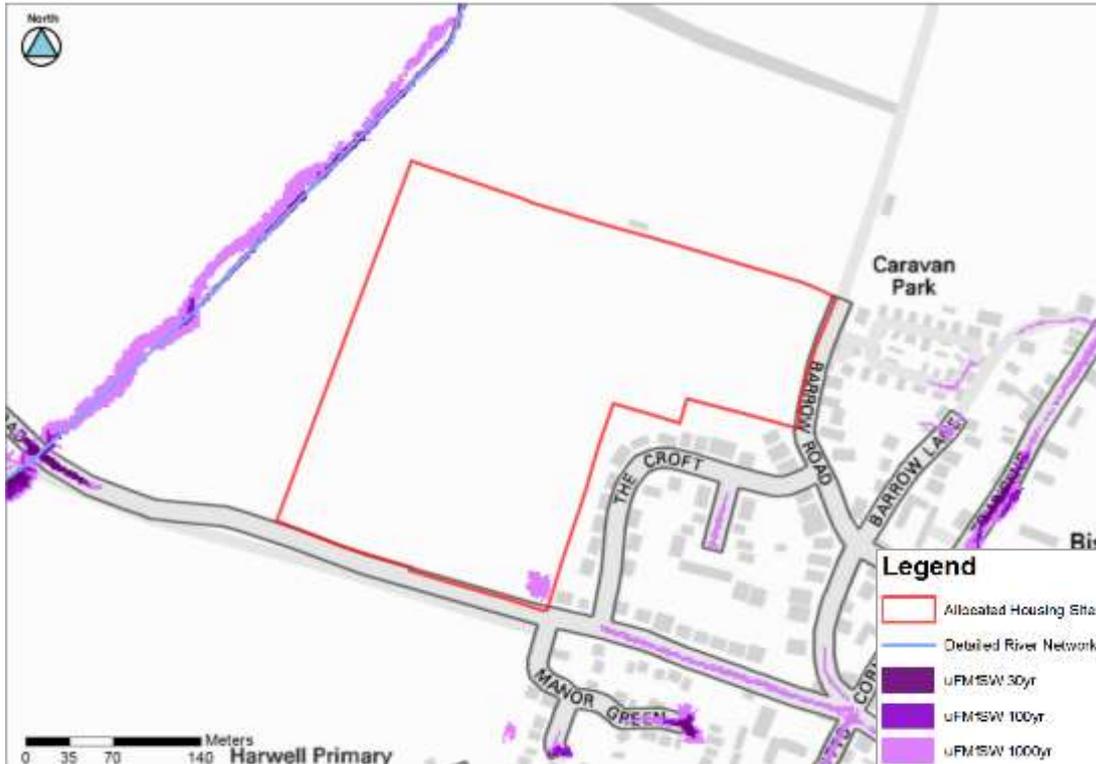


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Surface water

The uFMfSW shows an area (336m²) of ponding to the south of the site with a 1 in 30 chance of occurring in any given year.

Flood Map for Surface Water



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Groundwater

The AStGWF map suggests the area is mostly in the lowest and low categories of risk of groundwater flood emergence. No historical record of groundwater flooding.

Sewer

No known sewer flooding problems.

Effects of climate change

Increased rainfall intensity in the future may exacerbate any surface water flooding problems.

Available survey/detailed modelling

No detailed models available.

Implications for development

- Requires a full FRA for a site >1ha in Flood Zone 1.
- Drainage strategy should be submitted at an early stage to cover mitigation of any surface water risk and reduce impact downstream through site design and SuDS methods.
- Thames Water should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.

3.4.11 East of Harwell Campus

East of Harwell Campus			
Area: 61.74 ha	Brownfield/greenfield: Greenfield	Proposed use: Residential - 850 houses	Flood risk vulnerability classification: More vulnerable/less vulnerable

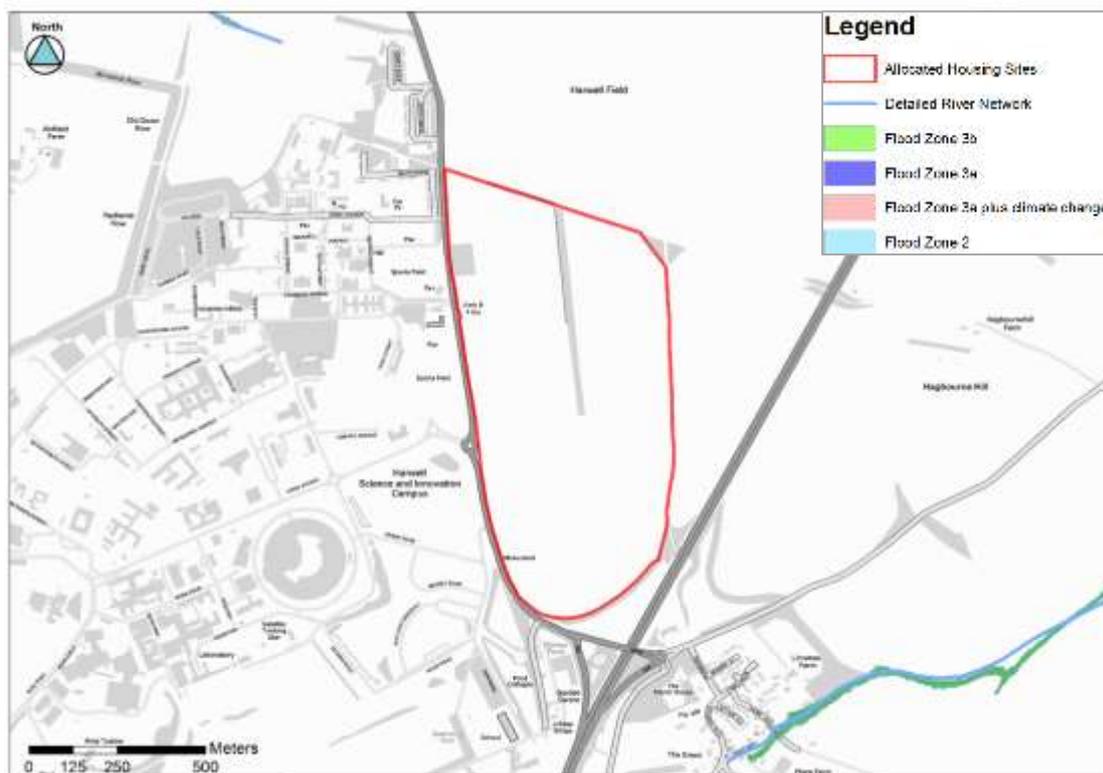
Summary of flood risk to site

Fluvial

There is no known risk from fluvial flooding.

There are no flood defences.

Flood Zone map

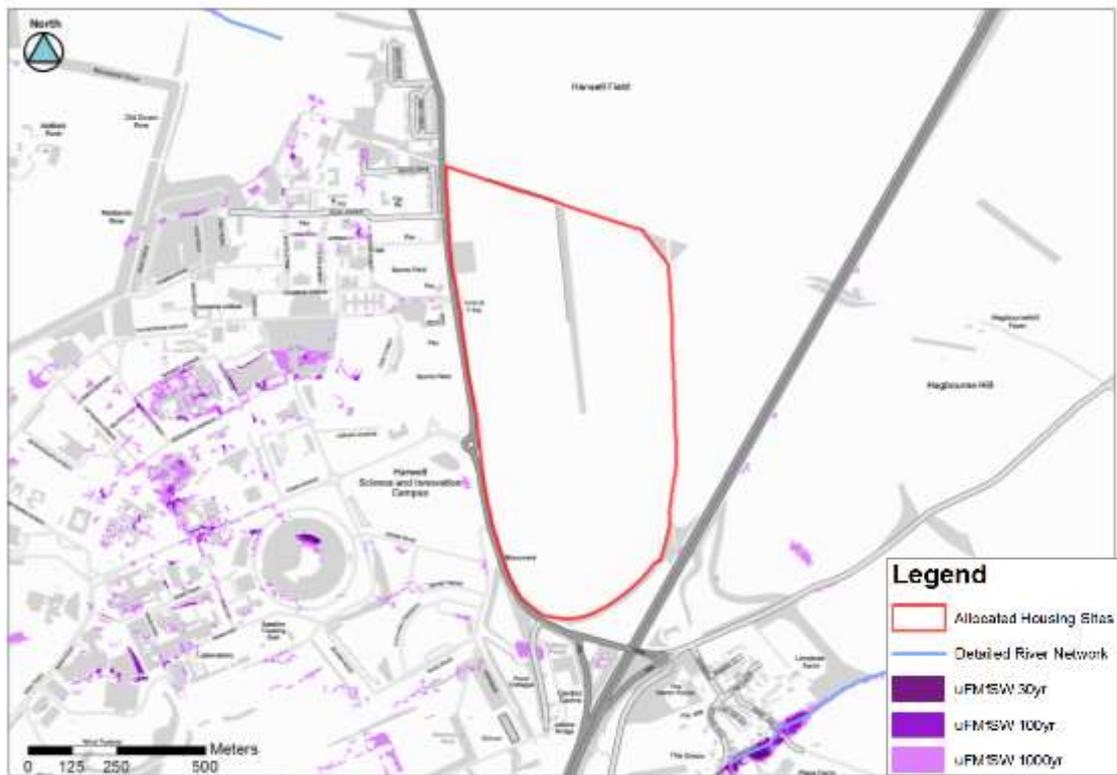


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Surface water

The uFMfSW shows no surface water flood risk to the site.

Flood Map for Surface Water



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Groundwater

The AStGWF map suggests the area is mostly in the lowest category of risk of groundwater flood emergence. No historical record of groundwater flooding.

Sewer

No known sewer flooding problems.

Effects of climate change

Increased rainfall intensity in the future may exacerbate any surface water flooding problems.

Available survey/detailed modelling

No detailed models available.

Implications for development

- Requires a full FRA for a site >1ha in Flood Zone 1.
- Drainage strategy should be submitted at an early stage to cover mitigation of any surface water risk and reduce impact downstream through site design and SuDS methods.
- Thames Water should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.

3.4.12 North of Harwell Campus

North of Harwell Campus			
Area: 18.93 ha	Brownfield/greenfield: Greenfield	Proposed use: Residential - 550 houses	Flood risk vulnerability classification: More vulnerable/less vulnerable

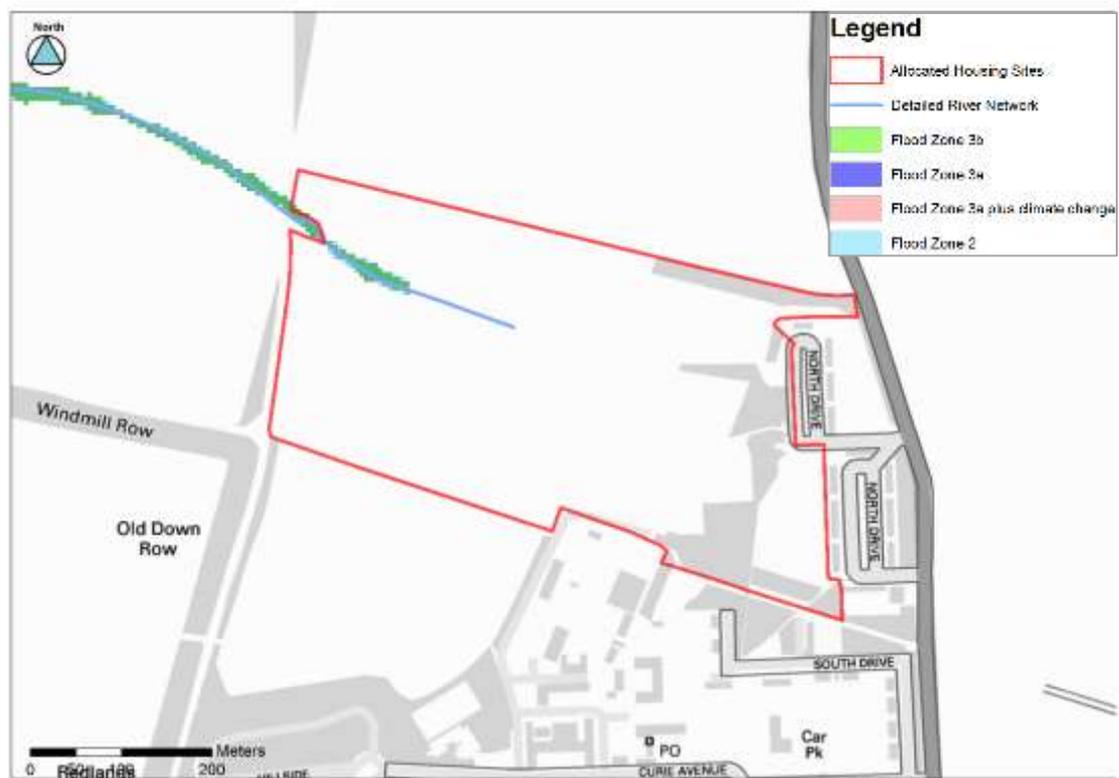
Summary of flood risk to site

Fluvial

A small area of the site is within Flood Zone 2 and 3 around the watercourse which flows west from the site.

There are no flood defences.

Flood Zone map

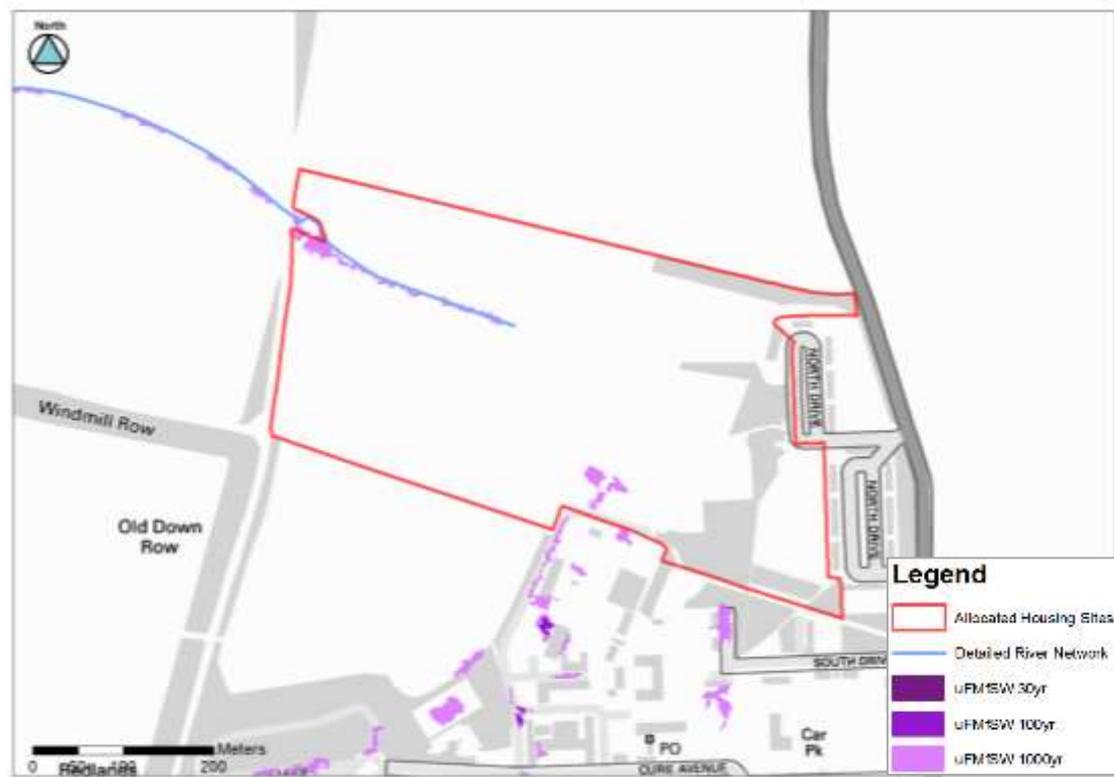


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Surface water

The uFMfSW shows two areas of flooding with a 1 in 1000 change of occurring in any given year. No local evidence to support this.??

Flood Map for Surface Water



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Groundwater

The AStGWF map suggests the area is mostly in the lowest category of risk of groundwater flood emergence. No historical record of groundwater flooding.

Sewer

No known sewer flooding problems.

Effects of climate change

Increased rainfall intensity in the future may exacerbate any surface water flooding problems.

Available survey/detailed modelling

No detailed models available.

Implications for development

- Requires a full FRA for a site in Flood Zone 2, 3 and >1 ha in Flood Zone 1.
- The FRA should demonstrate that the development will not be at risk from the small watercourses crossing the site, taking into account the effects of potential blockage of the culverts, though detailed modelling if necessary. The location of existing drains and watercourses should be preserved.
- FRA should include a detailed assessment of groundwater flood risk.
- It must be demonstrated that the site will be designed sequentially ensuring all development will be outside of Flood Zone 2 with climate change, and any flood risk areas or flow routes defined by modelling of small watercourses and groundwater investigation.
- It must be demonstrated that safe, dry access and egress will be available during a severe flood event.
- Drainage strategy should be submitted at an early stage to cover mitigation of any surface water risk and reduce impact downstream through site design and SuDS methods.
- Thames Water should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.

3.4.13 East Hanney

East Hanney			
Area: 8.2 ha	Brownfield/greenfield: Greenfield	Proposed use: Residential - 200 houses	Flood risk vulnerability classification: More vulnerable/less vulnerable

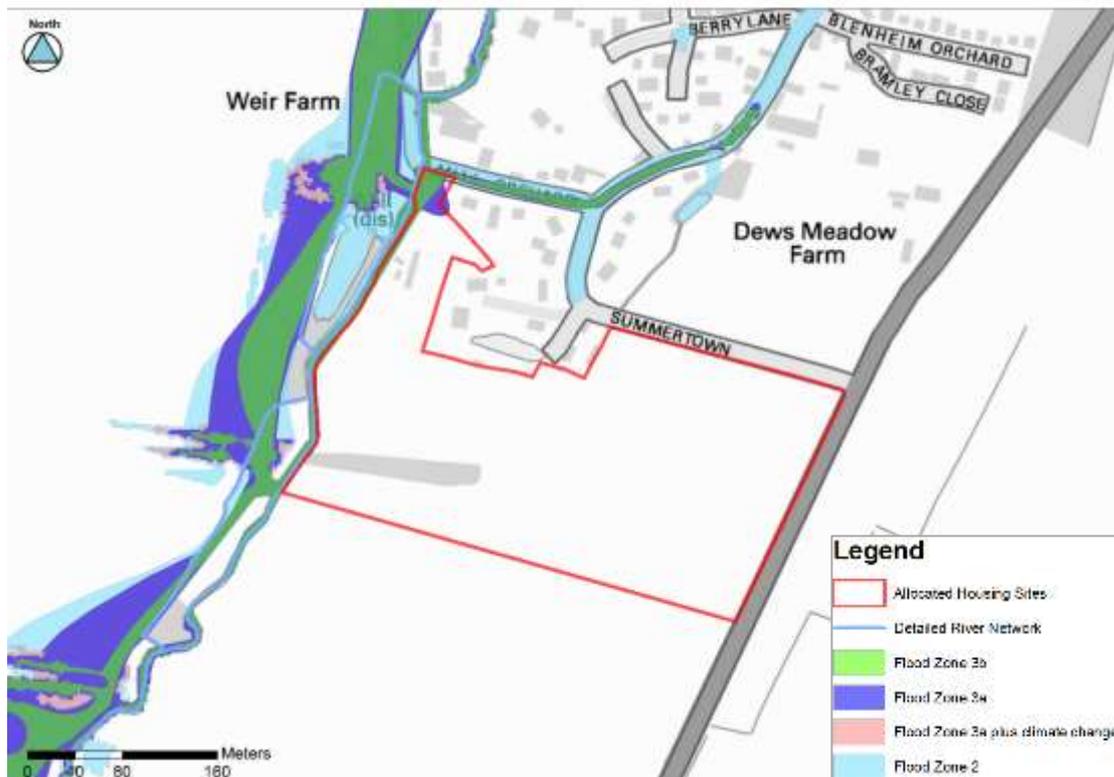
Summary of flood risk to site

Fluvial

The site is in Flood Zone 2 and 3 on the north west part of the site. Mill Orchard road, immediately north of the site is in both flood zones. Letcombe Brook runs along the western boundary of the site.

A number of properties were flooded in July 2007 by Letcombe Brook in East Hanney. There are no flood defences.

Flood Zone map

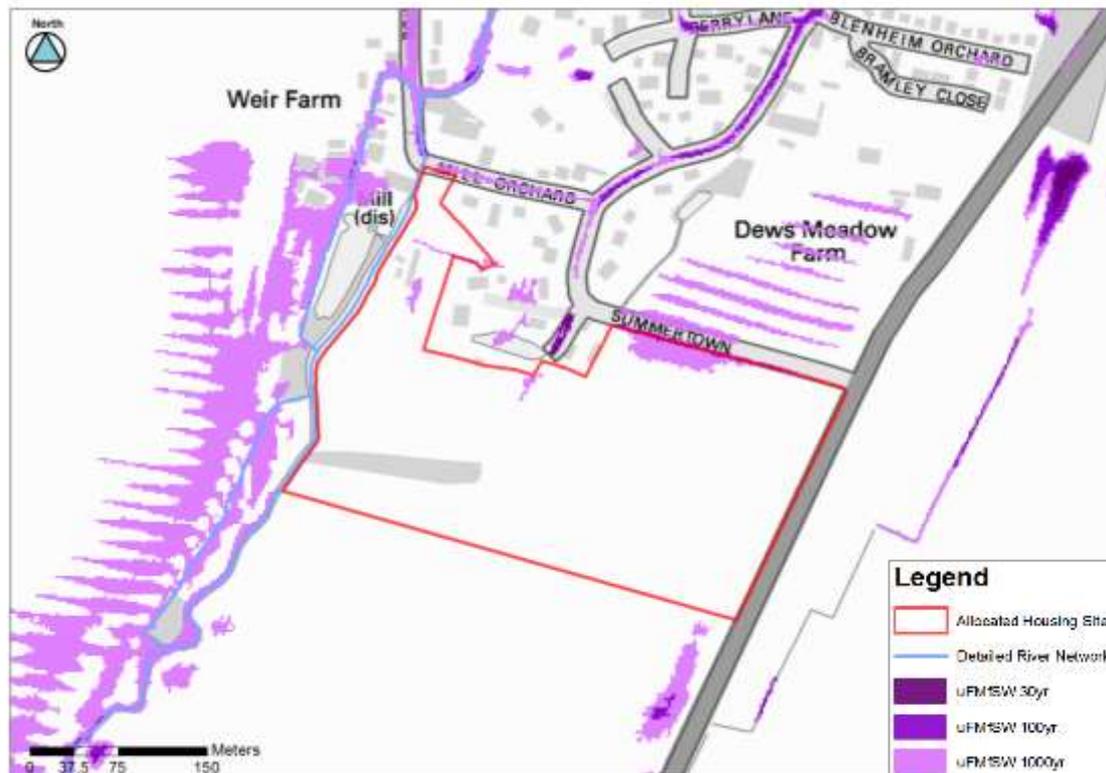


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Surface water

The uFMfSW shows a potential flow path shown to west edge of site, and other small areas of ponding for the uFMfSW 1000yr. No local evidence to support this.

Flood Map for Surface Water



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Groundwater

The AstGWF map suggests the area is in the highest category of risk of groundwater flood emergence. No historical record of groundwater flooding.

Sewer

No known sewer flooding problems.

Effects of climate change

Increased rainfall intensity in the future may exacerbate any surface water flooding problems.

Available survey/detailed modelling

The following detailed model has been used in the Flood Map:

- Letcombe Brook (Environment Agency, 2009)

Implications for development

- Requires a full FRA for a site in Flood Zone 2, 3 and >1 ha in Flood Zone 1.
- It must be demonstrated that the site will be designed sequentially ensuring all development will be outside of Flood Zone 2 with climate change.
- It must be demonstrated that safe, dry access and egress will be available during a severe flood event from both sides of the site.
- Opportunities for enhancing the amenity value of the area within the Flood Zones, although the safety of users in the event of a flood should be paramount.
- The development must not increase existing flood risk downstream. A drainage strategy should be submitted at an early stage to cover mitigation of any surface water risk and reduce impact downstream through site design and SuDS methods. Runoff less than greenfield rates is desirable.
- Thames Water should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.

3.4.14 Crab Hill Wantage

Please refer to the full SFRA for details of this site, as no changes have been made to the boundary or Flood Zones since its publication.

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3.4.15 Monks Farm, Grove

Monks Farm, Grove was originally assessed in the full SFRA. As changes have been made to the boundary of the site (at both the western and eastern extents) since the SFRA was completed, the site has been reassessed.

Monks Farm, Grove			
Area: 56.7 ha	Brownfield/greenfield: Greenfield	Proposed use: Residential - 750 houses	Flood risk vulnerability classification: More vulnerable/less vulnerable

Summary of flood risk to site

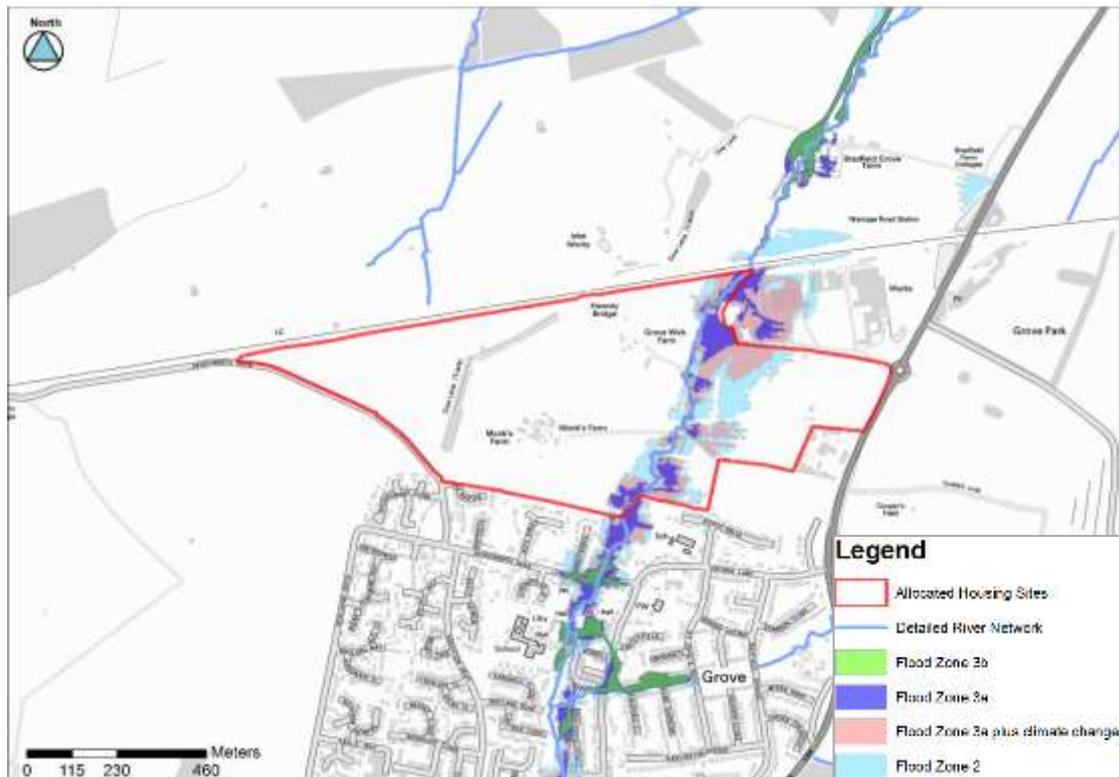
Fluvial

Letcombe Brook flows from south to north through the centre of the site. Flood Zone 2 is significantly more extensive than Flood Zone 3, with a width of up to 250m, mostly on the right bank side of the Brook.

A number of properties were flooded in July 2007 by Letcombe Brook downstream of the site in East Hanney.

There are no flood defences.

Flood Zone map

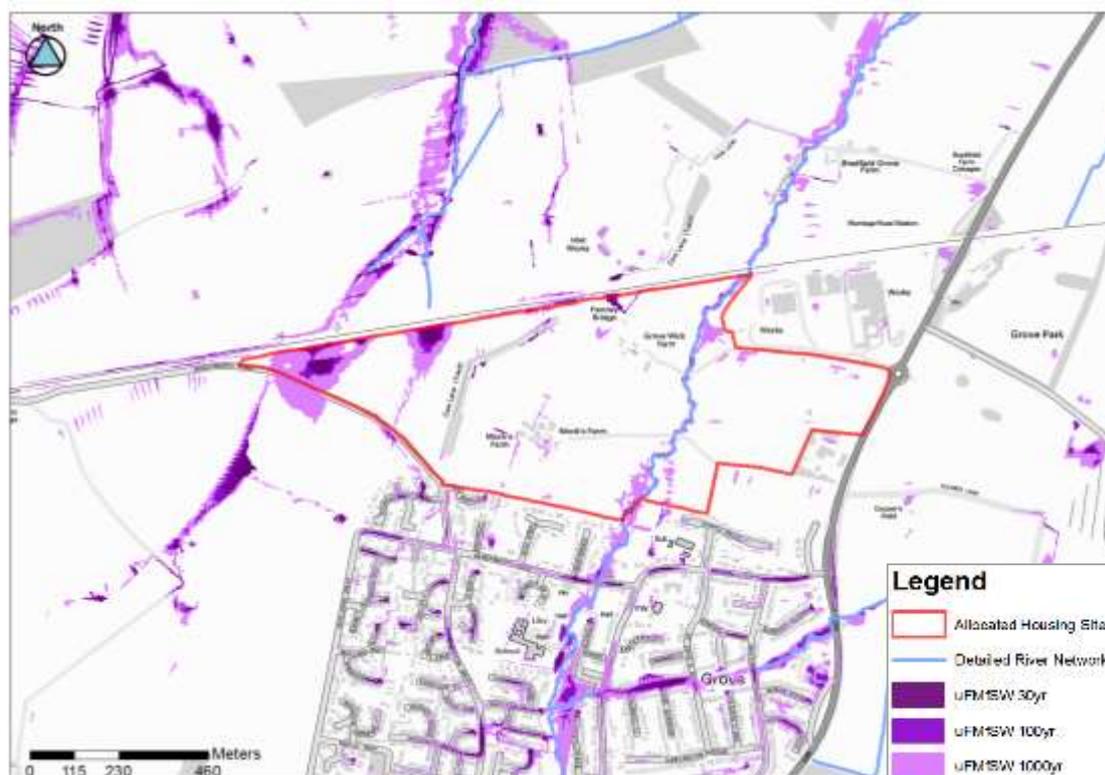


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Surface water

The uFMfSW shows some areas of potential ponding, the largest extent near the west of the site. This part of the site was not originally assessed in the 2013 SFRA, therefore it is important to note the changes. The VOWH Flood Database and records of 2007 flood grant claimants show multiple incidents of property flooding in the North Drive area.

Flood Map for Surface Water



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Groundwater

The AStGWF map suggests that most of the area is in the highest category of risk of groundwater flood emergence. No historical record of groundwater flooding.

Sewer

No reported problems on site (this is a greenfield site). There are existing sewer flooding problems in Wantage (e.g. Manor Road) are known through Council flood investigations and newspaper reports.

The north west corner of site is close to a sewage treatment works, therefore potential for foul sewage to be drained directly to the STW. Odour may be an issue close to the STW.

Effects of climate change

Increased rainfall intensity in the future may exacerbate any surface water flooding problems, such as increased river flows causing frequent and more severe fluvial flooding from Letcombe Brook.

Available survey/detailed modelling

The following detailed model has been used in the Flood Map:

- Letcombe Brook (Environment Agency, 2009)

Implications for development

- Requires a full FRA for a site in Flood Zone 2, 3 and >1 ha in Flood Zone 1..
- It must be demonstrated that the site will be designed sequentially ensuring all development will be outside of Flood Zone 2 with climate change.
- It must be demonstrated that safe, dry access and egress will be available during a severe flood event from both sides of the site.
- Opportunities for enhancing the amenity value of the area within the Flood Zones, although the safety of users in the event of a flood should be paramount.
- The development must not increase existing flood risk downstream. A drainage strategy

should be submitted at an early stage to cover mitigation of any surface water risk and reduce impact downstream through site design and SuDS methods. Runoff less than greenfield rates is desirable.

- Thames Water should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.

Implications for the Grove Northern Link Road

A bridge will be required across the Letcombe Brook as part of the Grove Northern Link Road project.

The available modelling suggests that flows through the bridge will be around 14.1 m³/s in a 100 year with climate change event, and 22.6 m³/s in a 1000 year event. The natural floodplain is relatively wide here, and there are ecological considerations for this natural chalk stream. The road is therefore likely to require a wide span bridge having least possible impact on the natural floodplain.

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3.4.16 Land South of Park Road, Faringdon

Please refer to the full SFRA for details of this site, as no changes have been made to the boundary or Flood Zones since its publication.

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3.4.17 Stanford in the Vale

Stanford in the Vale			
Area: 11.62ha	Brownfield/greenfield: Greenfield	Proposed use: Residential - 200 houses	Flood risk vulnerability classification: More vulnerable/less vulnerable

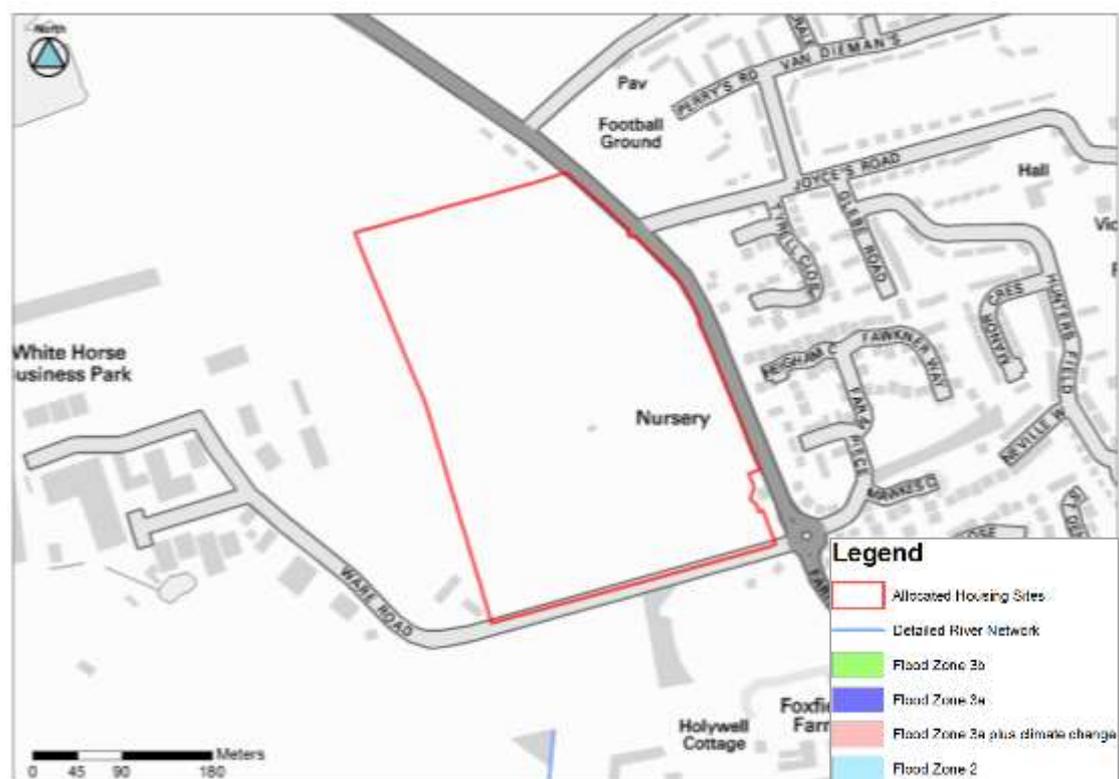
Summary of flood risk to site

Fluvial

There is no known risk from fluvial flooding.

There are no flood defences.

Flood Zone map

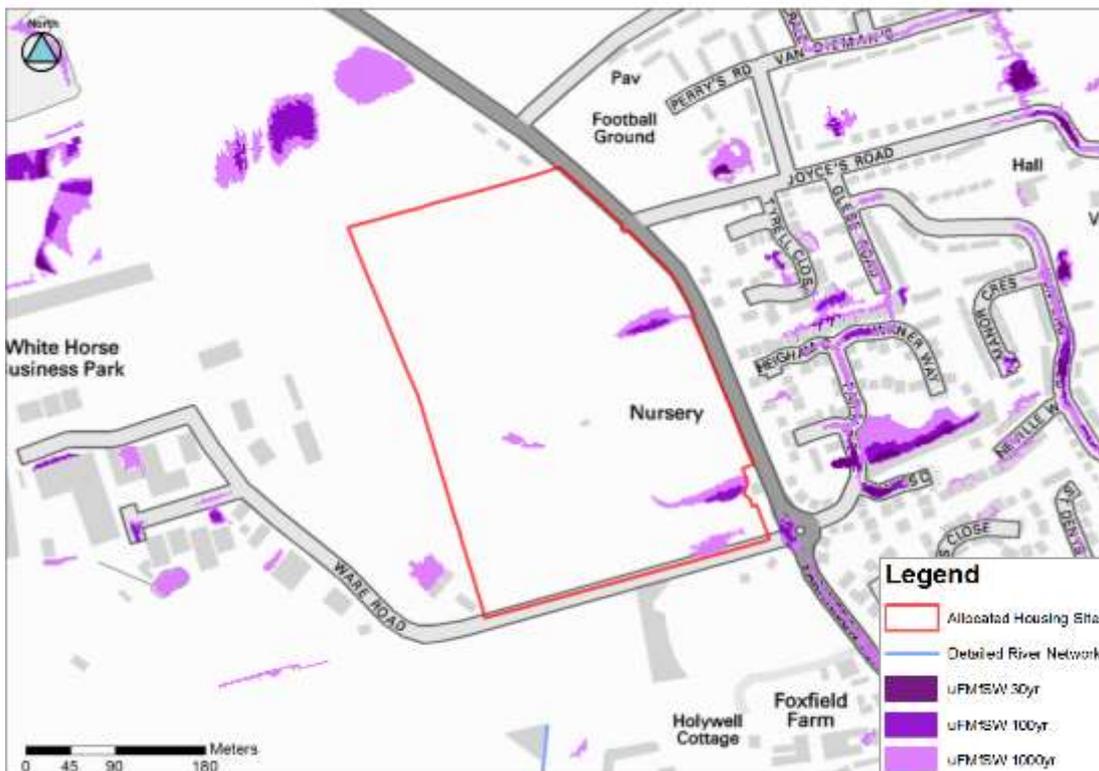


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Surface water

The uFMfSW shows some small areas of ponding for the 100yr and 1000yr maps. No local evidence to support this.

Flood Map for Surface Water



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Groundwater

The AStGWF map suggests the area is mostly in the lowest category of risk of groundwater flood emergence. No historical record of groundwater flooding.

Sewer

No known sewer flooding problems.

Effects of climate change

Increased rainfall intensity in the future may exacerbate any surface water flooding problems.

Available survey/detailed modelling

No detailed models available.

Implications for development

- Requires a full FRA for a site >1ha in Flood Zone 1.
- Drainage strategy should be submitted at an early stage to cover mitigation of any surface water risk and reduce impact downstream through site design and SuDS methods.
- Thames Water should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.

3.4.18 South Faringdon, (Parish of Great Coxwell)

South Faringdon, (Parish of Great Coxwell)			
Area: 18.35 ha	Brownfield/greenfield: Greenfield	Proposed use: Residential - 200 houses	Flood risk vulnerability classification: More vulnerable/less vulnerable

Summary of flood risk to site

Fluvial

A minor watercourse runs through the site from the north west to the south at a right angle. There is no known risk from fluvial flooding. There are no flood defences.

Flood Zone map

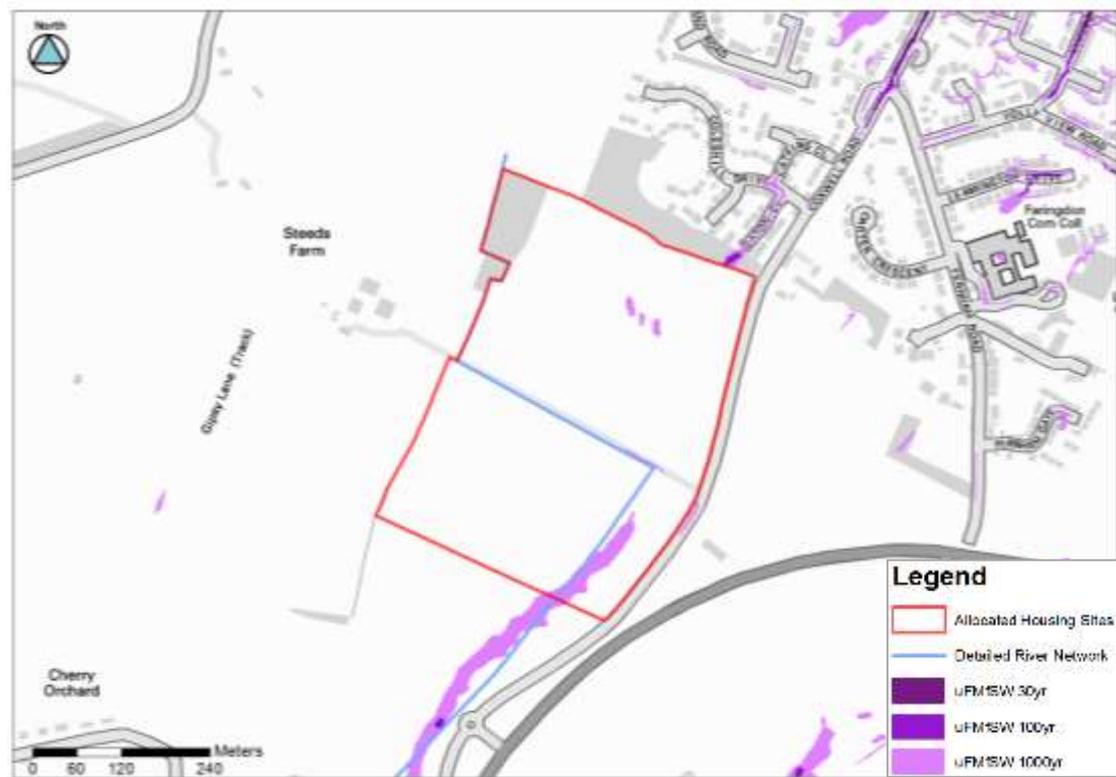


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Surface water

The uFMfSW shows a potential flow path shown to west edge of site for the 1000yr map, and other small areas of ponding. No local evidence to support this.

Flood Map for Surface Water



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Groundwater

The AStGWF map suggests the area is mostly in the lowest category of risk of groundwater flood emergence. No historical record of groundwater flooding.

Sewer

No known sewer flooding problems.

Effects of climate change

Increased rainfall intensity in the future may exacerbate any surface water flooding problems.

Available survey/detailed modelling

No detailed models available.

Implications for development

- Requires a full FRA for a site >1ha in Flood Zone 1.
- Drainage strategy should be submitted at an early stage to cover mitigation of any surface water risk and reduce impact downstream through site design and SuDS methods.
- Thames Water should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.

3.4.19 South West Faringdon

South West Faringdon			
Area: 10.47 ha	Brownfield/greenfield: Greenfield	Proposed use: Residential - 200 houses	Flood risk vulnerability classification: More vulnerable/less vulnerable

Summary of flood risk to site

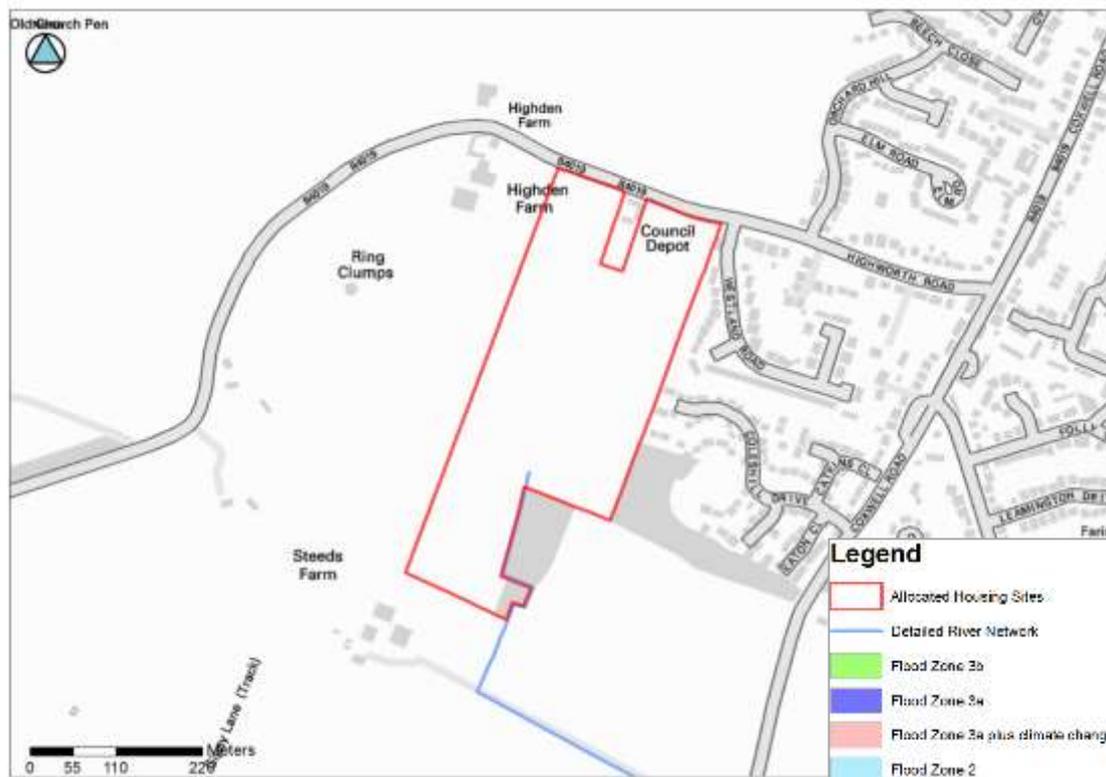
Fluvial

A minor watercourse runs along the site boundary at the south of the site.

There is no known risk from fluvial flooding.

There are no flood defences.

Flood Zone map

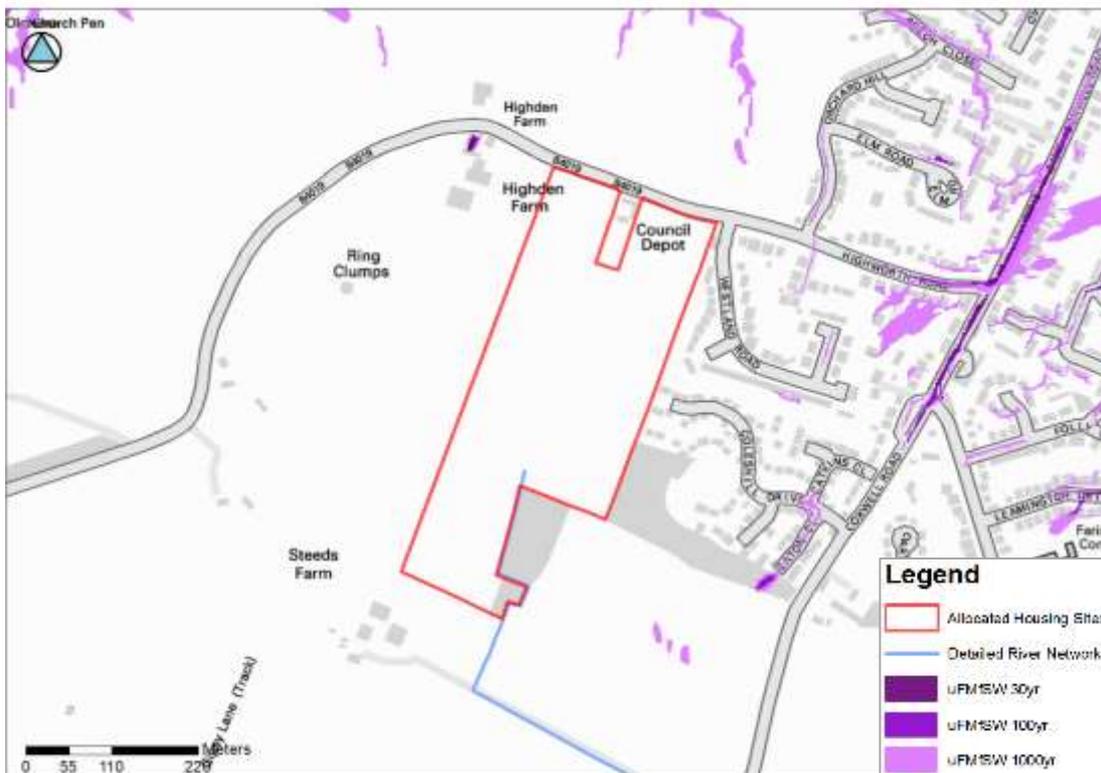


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Surface water

The uFMfSW shows no risk of surface water flooding.

Flood Map for Surface Water



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Groundwater

The ASTGWF map suggests the area is mostly in the lowest category of risk of groundwater flood emergence. No historical record of groundwater flooding.

Sewer

No known sewer flooding problems.

Effects of climate change

Increased rainfall intensity in the future may exacerbate any surface water flooding problems.

Available survey/detailed modelling

No detailed models available.

Implications for development

- Requires a full FRA for a site >1ha in Flood Zone 1.
- Drainage strategy should be submitted at an early stage to cover mitigation of any surface water risk and reduce impact downstream through site design and SuDS methods.
- Thames Water should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.

3.4.20 North Shrivvenham

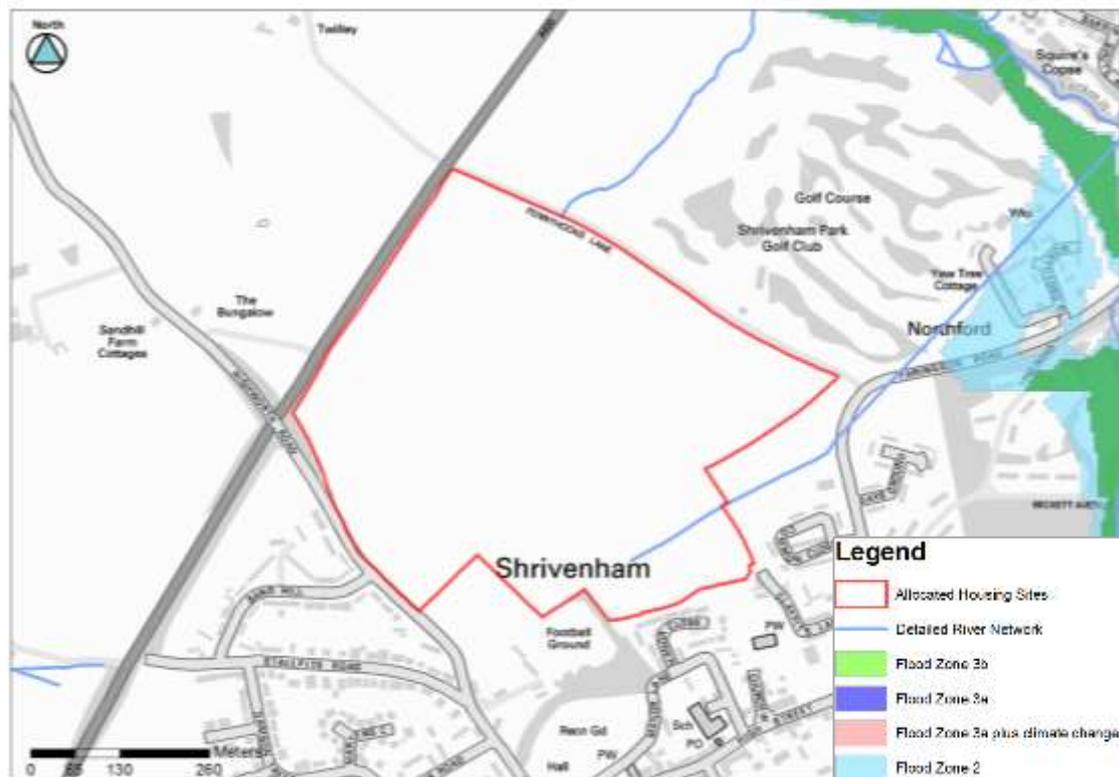
North Shrivvenham			
Area: 31.47 ha	Brownfield/greenfield: Greenfield	Proposed use: Residential - 500 houses	Flood risk vulnerability classification: More vulnerable/less vulnerable

Summary of flood risk to site

Fluvial

A tributary of the Tuckmill Brook flows through the south of the site. There is no known risk from fluvial flooding. There are no flood defences.

Flood Zone map



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3.4.21 East of Coxwell Road, Faringdon

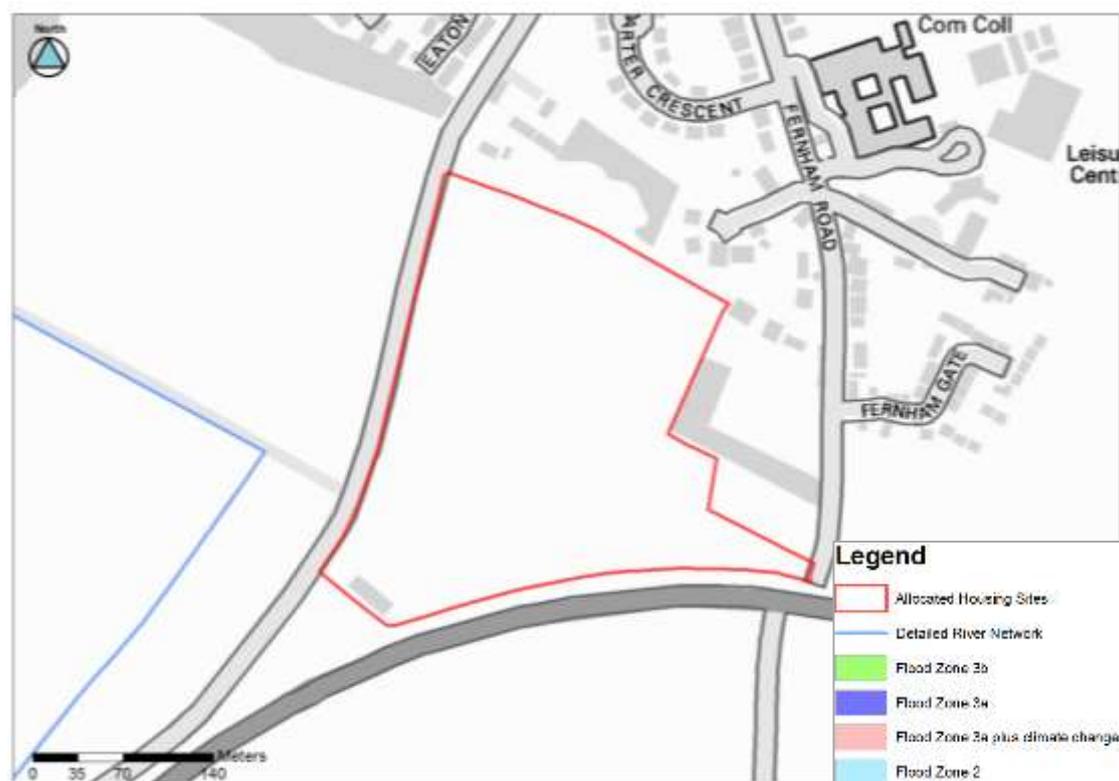
East of Coxwell Road, Faringdon			
Area: 8 ha	Brownfield/greenfield: Greenfield	Proposed use: Residential - 200 houses	Flood risk vulnerability classification: More vulnerable/less vulnerable

Summary of flood risk to site

Fluvial

There is no known risk from fluvial flooding.
There are no flood defences.

Flood Zone map

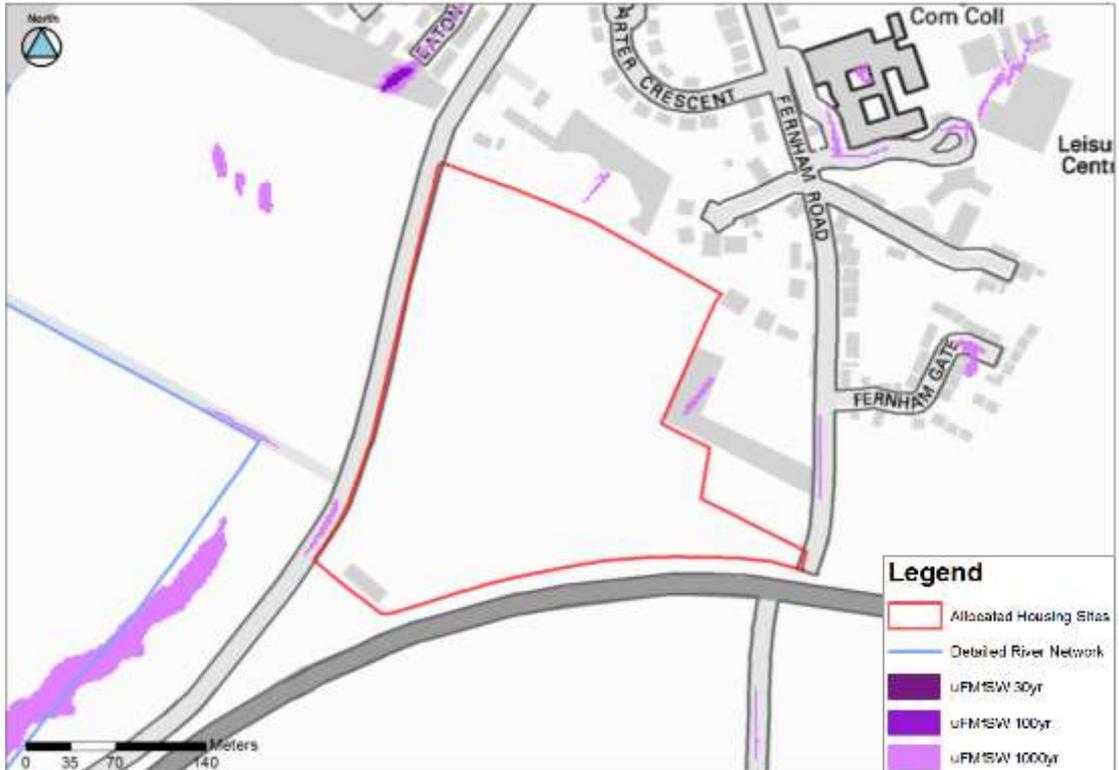


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Surface water

The uFMfSW shows no risk of surface water flooding to the site. No historic evidence of surface water flooding.

Flood Map for Surface Water



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Groundwater

The AStGWF map suggests the area is mostly in the lowest category of risk of groundwater flood emergence. No historical record of groundwater flooding.

Sewer

No known sewer flooding problems.

Effects of climate change

Increased rainfall intensity in the future may exacerbate any surface water flooding problems.

Available survey/detailed modelling

No detailed models available.

Implications for development

- Requires a full FRA for a site >1ha in Flood Zone 1.
- Drainage strategy should be submitted at an early stage to cover mitigation of any surface water risk and reduce impact downstream through site design and SuDS methods.
- Thames Water should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.

4 Useful Documents and Links

District Council planning policy documents (including Local Plan and Core Strategy)

Vale of White Horse planning website

<http://www.whitehorsedc.gov.uk/services-and-advice/planning-and-building/planning-policy>

Vale of White Horse Neighbourhood plans

www.whitehorsedc.gov.uk/neighbourhoodplans.

South Oxfordshire planning website

<http://www.southoxon.gov.uk/services-and-advice/planning-and-building/planning-policy>

South Oxfordshire Neighbourhood Plans

<http://www.southoxon.gov.uk/services-and-advice/planning-and-building/planning-policy/neighbourhood-plans>.

JBA (2010) Sequential and Exception Test for Bury Street and the Charter Area, Abingdon Town Centre. Report on behalf of Vale of White Horse District Council

<http://www.whitehorsedc.gov.uk/sites/default/files/Sequential%20and%20exception%20test%20for%20Bury%20Street%20and%20Charter%20Area,%20Abingdon.pdf>

Lead Local Flood Authority flood risk management documents

Oxfordshire County Council Local Flood Risk Management Strategy website

<http://www.oxfordshire.gov.uk/cms/content/oxfordshire-local-flood-risk-management-strategy>

Oxfordshire County Council (June 2011) Preliminary Flood Risk Assessment

<http://www.oxfordshire.gov.uk/cms/sites/default/files/folders/documents/environmentandplanning/flood/pfra/PFRApreliminaryreport.pdf>

Legislation and government guidance

Localism Act (2011) Section 110: Duty to cooperate in relation to planning of sustainable development

<http://www.legislation.gov.uk/ukpga/2011/20/section/110>

Flood and Water Management Act (2010)

<http://www.legislation.gov.uk/ukpga/2010/29/contents>

National Planning Policy Framework, Department of Communities and Local Government (2012)

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

Technical Guidance to the National Planning Policy Framework, Department of Communities and Local Government (2012)

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6000/2115548.pdf

Defra (March 2010) Surface Water Management Plan Technical Guidance

<http://www.defra.gov.uk/publications/files/pb13546-swmp-guidance-100319.pdf>

Department of Communities and Local Government (2009) Planning Policy Statement 25: Development and Flood Risk Practice Guide

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7772/pps25guideupdate.pdf

Department of Communities and Local Government (2007) Improving the Flood Performance of New Buildings: Flood Resilient Construction

http://www.planningportal.gov.uk/uploads/br/flood_performance.pdf

Environment Agency resources and guidance

Environment Agency website, Flood information

<http://www.environment-agency.gov.uk/homeandleisure/floods/default.aspx>

Environment Agency, Risk of flooding from reservoirs map

http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&p=map&textonly=off&lang=_e&topic=reservoir

Environment Agency, Flood Map (Risk of flooding from rivers and the sea)

http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&p=map&textonly=off&lang=_e&topic=floodmap

Environment Agency Flood Risk Standing Advice

<http://www.environment-agency.gov.uk/research/planning/82584.aspx>

Environment Agency, FRA Guidance Note 1

http://www.environment-agency.gov.uk/static/documents/Utility/FRAGuidanceNote1_v3.1.pdf

Environment Agency, FRA Guidance Note 3

http://www.environment-agency.gov.uk/static/documents/Utility/FRAGuidanceNote3_v3.1.pdf

Environment Agency (2012) Demonstrating the flood risk Sequential Test for Planning Applications version 3.1

http://www.environment-agency.gov.uk/static/documents/Business/SequentialTestProcess_v3.1.pdf

Environment Agency SuDS guidance

<http://www.environment-agency.gov.uk/business/sectors/39909.aspx>

Environment Agency (2006) Building a better environment: A guide for developers

[http://www.environment-agency.gov.uk/static/documents/1_GETH1106BLNE-e-e\(1\).pdf](http://www.environment-agency.gov.uk/static/documents/1_GETH1106BLNE-e-e(1).pdf)

Environment Agency (2010) Oxford Flood Risk Management Strategy

<http://www.environment-agency.gov.uk/homeandleisure/floods/127355.aspx>

Environment Agency (2008) Thames Catchment Flood Management Plan

<http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/geth1209bqyl-e-e.pdf>

Other resources and guidance

Association of British Insurers and National Flood Forum (April 2012) Guidance on Insurance and Planning in Flood Risk Areas for Local Planning Authorities in England

<http://www.planningofficers.org.uk/downloads/pdf/ABI%20%20NFF%20Guidance%20on%20Insurance%20and%20Planning%20for%20Local%20Planning%20Authorities.pdf>

CIRIA (2004) Development and Flood Risk: Guidance for the Construction Industry. Report C624

http://www.ciria.org/service/AM/ContentManagerNet/Search/SearchRedirect.aspx?Section=Search1&content=product_excerpts&template=/contentmanagernet/contentdisplay.aspx&contentfileid=1417

CIRIA (2007) The SuDS Manual (C697) (can be purchased at www.ciria.org)

CIRIA (2010) Culvert Design and Operation Guide. CIRIA report C689 (available free by registering at www.ciria.org)

Defra (2004) Strategy for Flood and Coastal Erosion Management: Groundwater Flooding Scoping Study (LDS23)

Defra/Environment Agency (2005) Preliminary rainfall runoff management for developments. R&D Technical Report W5-074/A/TR/1

<http://archive.defra.gov.uk/environment/flooding/documents/research/sc030219.pdf>

Defra/Environment Agency (2006) Flood Risks to People Phase 2. R&D Technical Report FD2321/TR2

<http://randd.defra.gov.uk/Default.aspx?Module=More&Location=None&ProjectID=12016>

National SuDS Working Group (2004) Interim Code of Practice for Sustainable Drainage Systems

http://www.environment-agency.gov.uk/static/documents/Business/icop_final_0704_872183.pdf

Susdrain website <http://www.susdrain.org/>

UK Climate Change Impacts Programme, Identifying adaptation options

http://www.ukcip.org.uk/wordpress/wp-content/PDFs/ID_Adapt_options.pdf

A Appendix: Maps

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