Strategic Flood Risk Assessment

Submitted to
West Oxfordshire District Council

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West Oxfordshire District Council Strategic Flood Risk Assessment

SFRA UPDATE REPORT

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Contents

List of Appendices

List of Tables

List of Acronyms

ACRONYM	DEFINITION
AOD	Above Ordnance Datum
AIMS	Asset Information Management System
BGS	British Geological Survey
CFMP	Catchment Flood Management Plan
CLG	(Department for) Communities and Local Government
Defra	Department for Environment, Flood and Rural Affairs
FRA	Flood Risk Assessment
FWMA	Flood and Water Management Act 2010
GIS	Geographical Information System
LiDAR	Light Detection and Ranging
LLFA	Lead Local Flood Authority
LPA	Local Planning Authority
LRF	Local Resilience Forum
NPPF	National Planning Policy Framework
OCC	Oxfordshire County Council
PPG	Planning Practice Guidance
RAMSAR	RAMSAR Sites
RTD	River Terrace Deposits
S&G	Sand and Gravel
SFRA	Strategic Flood Risk Assessment
SPA	Special Protection Area
SPD	Supplementary Planning Document
SPZ	Source Protection Zone
SuDS	Sustainable Drainage Systems
SSSI	Site of Special Scientific Interest
uFMfSW	Updated Flood Map for Surface Water
WODC	West Oxfordshire District Council

Glossary of terms

GLOSSARY	DEFINITION
1D Hydraulic Model	Hydraulic model which computes flow in a single dimension, suitable for representing systems with a defined flow direction such as river channels, pipes and culverts
2D Hydraulic Model	Hydraulic model which computes flow in multiple dimensions, suitable for representing systems without a defined flow direction including topographic surfaces such as floodplains
Asset Information Management System (AIMS)	Environment Agency database of assets associated with Main Rivers including defences, structures and channel types. Information regarding location, standard of service, dimensions and condition.
Aquifer	A source of groundwater comprising water bearing rock, sand or gravel capable of yielding significant quantities of water.
Attenuation	In the context of this report - the storing of water to reduce peak discharge of water.
Catchment Flood Management Plan	A high-level plan through which the Environment Agency works with their key decision makers within a river catchment to identify and agree policies to secure the long-term sustainable management of flood risk.
Climate Change	Long term variations in global temperature and weather patterns caused by natural and human actions. For fluvial events a 20% increase in river flow is applied and for rainfall events, a 30% increase. These climate change values are based upon information within the NPPF and Planning Practice Guidance.
Culvert	A channel or pipe that carries water below the level of the ground.
Design flood	A flood event of a given annual probability against which the suitability of a proposed development is assessed and mitigation measures, if any, are designed. The design event is generally taken as; fluvial flooding likely to occur with a 1% annual probability (1 in 100 chance each year), or tidal flooding with a 0.5% annual probability (1 in 200 chance each year).
DG5 Register	A water-company held register of properties which have reported sewer flooding due to hydraulic overload, or properties which are 'at risk' of sewer flooding more frequently than once in 20 years.
Exception Test	The exception test should be applied following the application of the sequential test. Conditions need to be met before the exception test can be applied.
Flood Defence	Infrastructure used to protect an area against floods, such as floodwalls and embankments; they are designed to a specific standard of protection (design standard).
Flood Resilience	Measures that minimise water ingress and promotes fast drying and easy cleaning, to prevent any permanent damage.
Flood Resistant	Measures to prevent flood water entering a building or damaging its fabric. This has the same meaning as flood proof.
Flood Risk	The level of flood risk is the product of the frequency or likelihood of the flood events and their consequences (such as loss, damage, harm, distress and disruption).
Flood Zone	Flood Zones show the probability of flooding, ignoring the presence of existing defences
Fluvial	Relating to the actions, processes and behaviour of a watercourse (river or stream).
Freeboard	Height of flood defence crest level (or building level) above designed water level
Functional Floodplain	Land where water has to flow or be stored in times of flood.
Groundwater	Water that is in the ground, this is usually referring to water in the saturated zone below the water table.
ISIS	A 1D hydraulic modelling software package.
Lead Local Flood Authority (LLFA)	As defined by the Flood and Water Management Act, in relation to an area in England, this means the unitary authority or where there is no unitary authority, the county council for the area, in this case Oxfordshire County Council.

Light Detection and Ranging (LiDAR)	Airborne ground survey mapping technique, which uses a laser to measure the distance between the aircraft and the ground.
Local Planning Authority (LPA)	Body that is responsible for controlling planning and development through the planning system.
Main River	Watercourse defined on a 'Main River Map' designated by Defra. The Environment Agency has permissive powers to carry out flood defence works, maintenance and operational activities for Main Rivers only.
Mitigation measure	An element of development design which may be used to manage flood risk or avoid an increase in flood risk elsewhere.
Ordinary Watercourse	A watercourse that does not form part of a Main River. This includes "all rivers and streams and all ditches, drains, cuts, culverts, dikes, sluices (other than public sewers within the meaning of the Water Industry Act 1991) and passages, through which water flows" according to the Land Drainage Act 1991.
Ramsar Site	Wetlands of international importance, designated under the Ramsar Convention
Residual Flood Risk	The remaining flood risk after risk reduction measures have been taken into account.
Risk	Risk is a factor of the probability or likelihood of an event occurring multiplied by consequence: Risk = Probability x Consequence. It is also referred to in this report in a more general sense.
Sequential Test	Aims to steer vulnerable development to areas of lowest flood risk.
Sewer Flooding	Flooding caused by a blockage or overflowing in a sewer or urban drainage system.
Source Protection Zone (SPZ)	Defined areas in which certain types of development are restricted to ensure that groundwater sources remain free from contaminants.
Surface Water	Flooding caused when intense rainfall exceeds the capacity of the drainage systems or when, during prolonged periods of wet weather, the soil is so saturated such that it cannot accept any more water.
Sustainable drainage systems (SuDS)	Methods of management practices and control structures that are designed to drain surface water in a more sustainable manner than some conventional techniques.
Topographic survey	A survey of ground levels.
TUFLOW	A modelling package for simulating depth averaged 2D free-surface flows and is in widespread use in the UK and elsewhere for 2D inundation modelling.

1 Introduction

1.1 Background

In its role as the Local Planning Authority (LPA), West Oxfordshire District Council (WODC) is currently preparing documents that will form the West Oxfordshire Local Plan and set the vision for future development across the District over the next 15 years.

A Level 1 Strategic Flood Risk Assessment (SFRA) was produced by AECOM (formerly URS Ltd) in April 2009 for Cherwell and WODC. Since this date there have been a number of changes to planning guidance including the introduction of the National Planning Policy Framework (NPPF) and the Flood and Water Management Act, the production of a national surface water map (Areas Susceptible to Surface Water Flooding (AStSWF) and Flood Map for Surface Water as well as updates to the Environment Agency's Flood Map.

In light of the availability of new flood risk data, WODC has taken this opportunity to update the existing SFRA documents to ensure that the best available data is used to support the development of their Local Plan.

1.2 Character of Study Area

West Oxfordshire District lies to the west of the City of Oxford and is bordered to the south by the River Thames and the administrative area of Vale of White Horse District Council; to the east by Cherwell District Council; to the north by Stratford-on-Avon District Council; and to the west by Cotswolds District Council. The district is predominantly a rural area, with unspoilt countryside, historic parkland, low-lying farmland and remnants of ancient forests.

It covers an area of approximately 714 km^2; of which approximately 34% falling within the Cotswolds Area of Outstanding Natural Beauty. It has 3 main Settlement Areas: Witney, Carterton and Chipping Norton located in the centre, south and north of the district respectively. In addition there are 6 rural service centres of Bampton, Burford, Charlbury, Eynsham, Long Hanborough and Woodstock.

Almost all of the land area across the West Oxfordshire District drains into the River Thames with numerous other watercourses across the District, the majority of which form part of the Upper Thames catchment.

1.3 Planning Context

The NPPF and Technical Guidance were published by the Department for Communities and Local Government (DCLG) in March 2012 and consolidate the Planning Policy Statement 25 (PPS25) Development and Flood Risk[4], and PPS25 Practice Guidance[5]. Accordingly, this SFRA has been prepared in accordance with the principles set out in the NPPF and supporting guidance.

The NPPF and accompanying Technical Guidance[3] emphasise that it is the responsibility of Local Planning Authorities (LPAs) to ensure that flood risk is understood and managed effectively using a risk-based approach throughout all stages of the planning process. The NPPF requires LPAs to undertake SFRAs to support the preparation of their Local Plan, including the application of the Sequential Test which seeks to steer development towards areas of lowest flood risk prior to consideration of areas of greater risk.

The Sequential Test will be prepared by WODC as part of the Evidence Base for sites allocated in the Local Plan.

1.4 Aims and Objectives of the SFRA Update

The purpose of this SFRA is to collate and present the most up to date flood risk information for use by WODC to inform the preparation of the West Oxfordshire Local Plan and prudent decision-making by Development Management officers on a day-to-day basis in accordance with the NPPF and supporting guidance.

In order to achieve this, the SFRA will:

- Provide an assessment of the impact of all potential sources of flooding in accordance with NPPF, including an assessment of any future impacts associated with climate change;

- Enable planning policies to be identified specific to local flooding issues;
- Provide information required to apply the Sequential Test for identification of land suitable for development in line with the principles of the NPPF;
- Provide baseline data to inform the Sustainability Appraisal of the Development Plan Documents (DPDs) with regard to catchment-wide flooding issues which affect the Study Area;
- Provide sufficient information to allow LPAs within the Study Area to assess the flood risk for specific development proposal sites, thereby setting out the requirements for site specific Flood Risk Assessments (FRAs);
- Provide recommendations of suitable mitigation measures including the objectives of Sustainable Drainage Systems (SuDS);
- Enable WODC and OCC to use the SFRA as a basis for decision making at the planning application stage;
- Where necessary, provide technical assessments to demonstrate that development located in flood risk areas are appropriate and in line with the requirements of the exception test; and,
- Present sufficient information to inform WODC and OCC of acceptable flood risk in relation to emergency planning capability

Position Statement **November 2016**

This document forms a Level 1 SFRA which has been carried out to support the completion of the Sequential Test by WODC and inform the allocation of sites within the Local Plan. Documents recording the application of the Sequential Test will be published as a separate document on the Council's website. Should the Sequential Test indicate that land outside flood risk areas cannot appropriately accommodate all necessary development; a further Level 2 SFRA will be undertaken to consider the detailed nature of flood risk within each zone and support the application of the Exception Test. A Level 2 SFRA has already been carried out in relation to the proposed North Witney Strategic Development Area (SDA) as a small part of the site as well as the associated strategic transport infrastructure is located within the floodplain.

1.5 Living Document

This SFRA has been developed building heavily upon existing knowledge with respect to flood risk within the District. The Environment Agency review and update the Flood Map for Planning (Rivers and Sea)[1] on a quarterly basis and a rolling programme of detailed flood risk mapping is underway.

New information may influence future development control decisions within these areas. Therefore it is important that the SFRA is adopted as a 'living' document and is reviewed regularly in light of emerging policy directives, flood risk datasets and an improving understanding of flood risk within the District.

2 Approach to Flood Risk Management

The National Planning Policy Framework[2] (NPPF) and supporting Technical Guidance[3] emphasise the active role LPAs such as WODC should take to ensure that flood risk is assessed, avoided, and managed effectively and sustainably throughout all stages of the planning process. The overall approach for the consideration of flood risk set out in Section 1 of the NPPG can be summarised as follows:

ASSESS FLOOD RISK → **AVOID FLOOD RISK** → **MANAGE & MITIGATE FLOOD RISK**

This has implications for LPAs and developers as described below.

2.1 Assess flood risk

The NPPF outlines that Local Plans should be supported by a Strategic Flood Risk Assessment (SFRA) and LPAs should use the findings to inform strategic land use planning. Figure 3.1 overleaf, reproduced from the NPPG, illustrates how flood risk should be taken into account in the preparation of the Local Plan by WODC.

For sites in areas at risk of flooding, or with an area of 1 hectare or greater, developers must undertake a site-specific Flood Risk Assessment (FRA) to accompany planning applications (or prior approval for certain types of permitted development).

2.2 Avoid flood risk

WODC should apply the sequential approach to site selection so that development is, as far as reasonably possible, located where the risk of flooding from all sources is lowest, taking account of climate change and the vulnerability of future users to flood risk.

In plan-making this involves applying the Sequential Test, and where necessary the Exception Test to Local Plans, as described in Section 7 of this SFRA report. The Sequential Test will be prepared by WODC as part of the Evidence Base for sites allocated in the Local Plan.

2.3 Manage and mitigate flood risk

Where alternative sites in areas at lower risk of flooding are not available, it may be necessary to locate development in areas at risk of flooding. In these cases, WODC and developers must ensure that development is appropriately flood resilient and resistant, safe for its users for the lifetime of the development, and will not increase flood risk overall. WODC and developers should seek flood risk management opportunities (e.g. safeguarding land), and to reduce the causes and impacts of flooding (e.g. through the use of sustainable drainage systems).

2 Communities and Local Government. 2012. National Planning Policy Framework. Available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2

3 NPPF Technical Guidance to NPPF, March 2012, DCLG. Available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6000/2115548.pdf

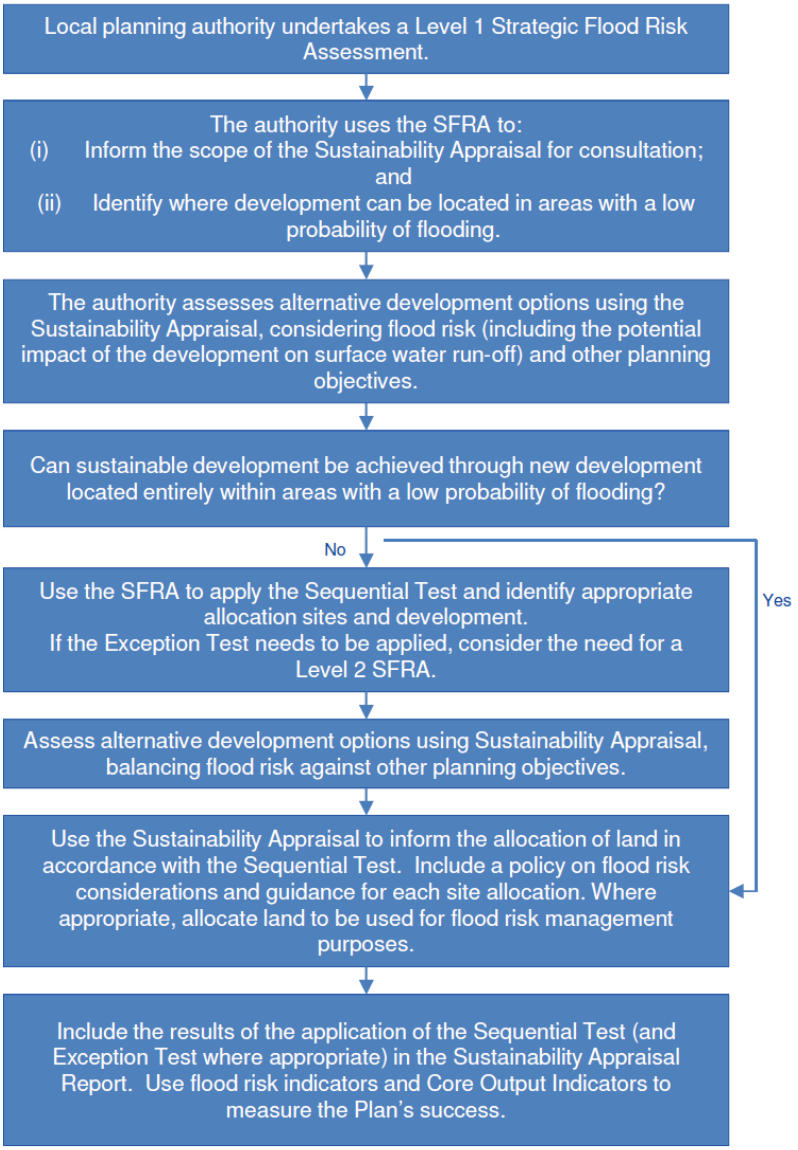


Figure 2-1 Taking flood risk into account in the preparation of a Local Plan (PPG for Flood Risk and Coastal Change, p6)

2.4 Flood Risk Policy and Guidance

There is an established body of policy and guidance documents which are of particular importance when considering development and flood risk. These are identified in Table 3.1 below and should be referred to when preparing and reviewing site specific flood risk assessments.

Table 2-1 Flood Risk Policy and Guidance Documents

Policy Documents	
National Planning Policy Framework (para. 99-104)	https://www.gov.uk/government/publications/national-planning-policy-framework--2
West Oxfordshire Policy Statement on Flood Defence	http://www.westoxon.gov.uk/media/135272/Flood-defence-policy.pdf
West Oxfordshire Local Plan – NE7: The Water Environment, NE8: Flood Risk and NE9: Surface Water	http://www.westoxon.gov.uk/media/176291/3-the-environment.pdf
West Oxfordshire Design Guide	http://www.westoxon.gov.uk/media/123778/wodg-2016_section1.pdf
Planning Policy Guidance – Flood Risk and Coastal Change	http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/
Environment Agency Standing Advice	https://www.gov.uk/flood-risk-assessment-standing-advice#vulnerable-developments-standing-advice

Policy Documents	
Thames Catchment Flood Management Plan	https://www.gov.uk/government/collections/catchment-flood-management-plans
Oxfordshire County Council Local Flood Risk Management Strategy	https://www.oxfordshire.gov.uk/cms/content/oxfordshire-local-flood-risk-management-strategy

2.5 Climate Change Guidance

A considerable amount of research is being carried out worldwide in an endeavour to quantify the impacts that climate change is likely to have on flooding in future years. Climate change may increase peak rainfall intensity and river flow, which could result in more frequent and severe flood events. Climate change is perceived to represent an increasing risk to low lying areas of England, and it is anticipated that the frequency and severity of flooding will change measurably within our lifetime.

The effects of climate change may exacerbate future flood risk. Current predictions indicate that milder, wetter winters and hotter, drier summers will be experienced in the future and there will be a continued rise in sea levels. These changes will potentially lead to changes in the magnitude, frequency and intensity of flood events. Those areas that are *currently* at risk of flooding may be susceptible to more frequent, more severe flooding in future years. It is essential therefore that the development control process (influencing the design of future development within the District) carefully mitigates against the potential impact that climate change may have upon the risk of flooding to the property/development.

In February 2016 the Environment Agency (EA) published revised guidance on climate change allowances in an update to the document 'Adapting to Climate Change: Advice to Flood and Coastal Erosion Risk Management Authorities'[4]. This version of the document reflects an assessment completed by the EA between 2013 and 2015 using UKCP09 data, to produce more representative climate change allowances for river basin districts across England.

In August 2016 the Environment Agency published the 'Thames Area Climate Change Allowances: Guidance for their use in flood risk assessments' which contains the specific guidance for development within the Thames area boundary. This document is attached in Appendix A. This document should be referred to inform all planning applications, local plans, neighbourhood plans and other projects. It provides:

- Climate change allowances for peak river flow, peak rainfall, sea level rise, wind speed and wave height
- A range of allowances to assess fluvial flooding, rather than a single national allowance
- Advice on which allowances to use for assessments based on vulnerability classification flood zone and development lifetime.

Please refer to Appendix A for the full guidance.

2.5.1 Mapped climate change peak river flow allowances in the absence of modelled data

At the time of writing, the EA do not hold specific modelling data to outline new climate change allowances for WODC. Therefore, following discussions with the EA, for the purposes of this SFRA, the 1 in 1000 year flood outline has been mapped as the climate change fluvial flood outline.

[4] Environment Agency, February 2016, Adapting to Climate Change: Advice to Flood and Coastal Erosion Risk Management Authorities. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/516116/LIT_5707.pdf

3 Methodology

Under Section 10 of NPPF, the risk of flooding from all sources must be considered as part of a SFRA, including flooding from rivers (fluvial), land (overland flow and surface water), groundwater, sewers and artificial sources. Flooding from the sea is not relevant to the study area.

The methodology for the appraisal of flood risk from these sources is outlined below, further details with regard to data sets can be found within the data register included in Appendix B.

3.1 Consultation

Under the Localism Act 2011[6], there is now a legal duty on LPAs to co-operate with one another to maximise the effectiveness within which certain activities are undertaken. WODC prepared and consulted on a Local Plan Core Strategy[7] as part of the background work required to prepare the West Oxfordshire Local Plan. Following on from this the Council published its draft Local Plan in October 2012 before submitting a revised draft Local Plan for examination in July 2015. Flood risk is identified as a strategic matter and specific engagement activities are proposed with a number of adjoining LPAs and Prescribed Bodies both in relation to the preparation of the SFRA and the Local Plan.

As part of the SFRA, several stakeholders were contacted provide to data and information to inform the assessment. Table 3-1 identifies key stakeholders and their responsibilities and information provided with respect to the SFRA.

Table 3-1 SFRA Stakeholder Organisations and Roles

Stakeholder Organisation	Role with respect to the West Oxfordshire DC SFRA
West Oxfordshire DC	As a LPA WODC has a responsibility to consider flood risk in their strategic land use planning and the development of their Local Plan. The NPPF requires LPAs to undertake a SFRA and to use their findings, and those of other studies, to inform strategic land use planning including the application of the Sequential Test which seeks to steer development towards areas of lowest flood risk prior to consideration of areas of greater risk. WODC is also required to consider flood risk and, when necessary, apply the Sequential and Exception Tests when assessing applications for development. During the preparation of the SFRA, West Oxfordshire DC has provided access to available datasets held by the Council regarding flood risk across the District. The SFRA will be used by the West Oxfordshire DC Emergency Planning team to ensure that the findings are incorporated into their understanding of flood risk.
Environment Agency	The EA is responsible for managing the risk of flooding from Main Rivers and the sea and has a responsibility to provide a strategic overview for all flooding sources and coastal erosion. The Environment Agency has a role to provide technical advice to LPAs and developers on how best to avoid, manage and reduce the adverse impacts of flooding. Part of this role involves advising on the preparation of spatial plans, sustainability appraisals and evidence base documents, including SFRAs as well as providing advice on higher risk planning applications. The Environment Agency undertakes systematic modelling and mapping of fluvial flood risk associated with all Main Rivers in the study area, as well as supporting Lead Local Flood Authorities (LLFA) with the management of surface water flooding by mapping surface water flood risk across England. The Environment Agency has supplied available datasets for use within the SFRA. The administrative area of WODC is served by the Thames Environment Agency area.

6 HMSO, 2011, Localism Act 2011.http://www.legislation.gov.uk/ukpga/2011/20/contents/enacted

7 West Oxfordshire: Our Local Strategy http://planningconsultation.westoxon.gov.uk/gf2.ti/f/236578/5181733.1/PDF/-/Core_Strategy_2011.pdf

Stakeholder Organisation	Role with respect to the West Oxfordshire DC SFRA
Oxfordshire County Council (OCC)	As the LLFA, under the Flood and Water Management Act (FWMA) OCC has a duty to take the lead in the coordination of local flood risk management, specifically defined as flooding from surface water, groundwater and ordinary watercourses and to this end has prepared the Local Flood Risk Management Strategy (LFRMS) for Oxfordshire[8]. OCC is responsible for regulation and enforcement on ordinary watercourses and is a statutory consultee for future sustainable drainage systems (SuDS) for major developments in the county, following changes to the Town and Country Planning (Development Management Procedures) (England) Order 2015. OCC is the Highways Authority and therefore has responsibilities for the effectual drainage of surface water from adopted roads insofar as ensuring that drains, including kerbs, road gullies and ditches and the pipe network which connect to the sewers, are maintained. As such, OCC is a key stakeholder in the preparation of the SFRA. OCC has provided current datasets in relation to the assessment of local sources of flooding (surface water, groundwater and ordinary watercourses), has been consulted on the draft project deliverables and will be involved in the implementation of any policy outcomes with respect to sustainable drainage or ordinary watercourse management.
Thames Water Utilities Ltd	Thames Water Utilities Ltd (TWUL) is responsible for surface water drainage from development via adopted sewers and for maintaining public sewers into which much of the highway drainage connects. In relation to the SFRA, the main role that TWUL will play is providing data regarding past sewer flooding.
Highways England	Under the Highways Act 1980, the Highways Agency has responsibilities for the effectual drainage of surface water from adopted roads along red routes insofar as ensuring that drains, including kerbs, road gullies and ditches and the pipe network which connect to the sewers, are maintained. Red routes are major roads on which vehicles are not permitted to stop. In relation to the SFRA, the Highways Agency was consulted to provide details of any known historic and recent flood risks along the highways in the District and any areas that are susceptible to flooding.
British Geological Survey (BGS)	BGS hold a number of datasets that have informed the SFRA, including superficial and bedrock geology, susceptibility to groundwater flooding and suitability of infiltration SuDS.
Neighbouring LPAs	The following LPAs adjoin WODC and will be consulted on the draft report; Gloucestershire County Council, Cherwell District Council, Cotswold District Council, Stratford-on-Avon District Council, Vale of White Horse District Council and Warwickshire County Council.

3.2 Data Collection

The following information and datasets have been made available by the stakeholder organisations and used to inform the assessment of flood risk from each of the sources. Further details are provided in Section 5 of this report and a data register is included in Appendix C.

- Terrain Information e.g. LiDAR, SAR, river cross-sections;
- Hydrology – EA Detailed River Network;
- EA Flood Zones – Flood Map for Planning (Rivers and Sea);
- Hydraulic modelling studies, used to define Flood Zone 3b & climate change outlines;
- EA AIMS Flood Defence Data;
- EA Flood Warning Areas;

8 Oxfordshire County Council Local Flood Risk Management Strategy https://www.oxfordshire.gov.uk/cms/content/oxfordshire-local-flood-risk-management-strategy

- Surface Water – EA's Updated Flood Map for Surface Water;
- Geology and hydrogeology – superficial and bedrock geology, groundwater vulnerability zones;
- Ordnance Survey Mapping;
- Risk of flooding from Reservoirs (EA);
- Historical flooding records (including sewer flooding records);
- WODC site allocation information.

3.3 Historical Flooding in West Oxfordshire

There have been numerous historical flood events in the West Oxfordshire study area. The most notable in recent memory was on the July 20th 2007 when extensive areas of the District were affected by fluvial and overland flooding as a result of a number of intensive rainfall events which commenced in the morning and subsided in the evening. A daily total rainfall measurement of 126.2mm was recorded at RAF Brize Norton on 20th July 2007.

Prior to this event, the largest recorded rainfall event was 79.5mm recorded in 1968. The nature of the event meant that there was little warning and widespread flooding of highways and property resulted. Over 1600 homes were directly affected internally with many others suffering damage to sheds, garages and gardens. Some 103 businesses were also flooded. A number of properties were affected by flooding for the first time. In response to the flood event, WODC issued Flood Defence Reports for Parishes affected by flooding in order to outline the best way forward.

Data provided by stakeholders with regard to historical events has been included in Section 5 Flood Risk Overview and is supported by data included in Appendix C.

3.4 GIS Data Gaps & Assumptions

In order to present complete flood zones with the best available information for the study area, it has been necessary to make certain assumptions in agreement with WODC and the EA/stakeholders so that gaps in data could be filled. These assumptions have been outlined in the preceding sections.

4 Flood Risk Review

4.1 Flooding from Rivers (Fluvial Flood Risk)

4.1.1 Detailed Main River Network

The Environment Agency 'Detailed River Network' dataset has been used to identify watercourses in the study area and their designation (i.e. Main River or Ordinary Watercourse). There are several Main Rivers present within the District, the most significant being:

- **Upper Thames -** The Upper Thames flows along the southern boundary of the District between Kelmscott and Cassington. The Upper Thames floodplain is relatively broad and flat and the river itself contains several islands. The Thames catchment covers a large area of approximately 12,935 km^2, incorporating the majority of the river catchments across the West Oxfordshire District.
- The **River Evenlode** and its tributaries have a catchment of approximately 181km^2. Flowing through the centre of the West Oxfordshire District, the River Evenlode catchment has borders with the Cherwell catchment to the north and west and the Windrush and Thames catchments to the south. The Evenlode is a major tributary to the Thames, flowing in a south east direction from its source in Moreton in Marsh in the Cotswold Hills passing the Wychwoods and Charlbury before joining the Thames approximately 5km north west of Oxford
- The **River Windrush** has a catchment area of approximately 363 km^2. The Windrush catchment is located south of the Evenlode catchment and North of the Thames. The Windrush flows south eastwards across the West Oxfordshire District through Burford, Swinbrook, Asthall, Minster Lovell and Witney from where it turns southwards to its confluence with the Thames at Newbridge, upstream of Oxford.

The Environment Agency Main Rivers map can be found at: http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=451500.0&y=206500.0&topic=mainriversvar&ep=map&scale=9&location=Oxford,%20Oxfordshire&lang=_e&layerGroups=default&distance=&textonly=off#x=450861&y=206972&lg=1,2,3,4,10,&scale=6

4.1.2 Ordinary Watercourse

As well as Main Rivers there are a number of smaller Ordinary Watercourses[9] in the district, which form tributaries of the Main Rivers. These are smaller streams, ditches and drainage channels, the majority of which are open channel.

Responsibility for the maintenance of ordinary watercourses is shared between Oxfordshire CC, WODC and riparian owners. Watercourses falling under the responsibility of WODC are cleared regularly and are continually monitored. Works include:

- Every 3 months watercourses are inspected and associated trash screens/culverts etc are cleared to prevent the build-up on leaves and rubbish which could cause a blockage to the drainage system.
- WODC inspect ditches under private riparian ownership which may be a possible cause of flooding and, if required, WODC will contact the riparian owner to remind them of their responsibilities.

Appendix B – Figure 1 – Watercourses and Water Bodies

9 This includes "all rivers and streams and all ditches, drains, cuts, culverts, dikes, sluices (other than public sewers within the meaning of the Water Industry Act 1991) and passages, through which water flows" according to the Land Drainage Act 1991.

4.1.3 EA Flood Map for Planning (Rivers and Sea)

The risk of flooding is a function of the probability that a flood will occur and the consequence to the community or receptor as a direct result of flooding. The NPPF seeks to assess the probability of flooding from rivers by categorising areas within the fluvial floodplain into zones of low, medium and high probability as defined in Table 4-1 below.

Table 4-1 Fluvial Flood Zones (extracted from the PPG, 2014)

Flood Zone	Flood Zone Definition for River Flooding	Probability of Flooding
Flood Zone 1	Land having a less than 1 in 1,000 chance of river flooding each year (0.1% annual probability). Shown as clear on the Flood Map – all land outside Flood Zones 2 and 3.	**Low**
Flood Zone 2	Land having between a 1 in 100 and 1 in 1,000 chance of river flooding each year (between 1% and 0.1% annual probabilities).	**Medium**
Flood Zone 3a	Land having a 1 in 100 or greater chance of river flooding each year (greater than 1% annual probability).	**High**
Flood Zone 3b	Land where water has to flow or be stored in times of flood, or land purposely designed to be flooded in an extreme flood event (0.1% annual probability). Defined by the LPA. Not separately distinguished from Flood Zone 3a on the Flood Map for Planning (Rivers and Sea).	**Functional Floodplain**

The EA's 'Flood Map for Planning (Rivers and the Sea)' provides information on areas that would flood if there were no flood defences or buildings in the "natural" floodplain. This dataset is available on the EA website[10] and is the main reference for planning purposes. The mapping is routinely updated and revised using results from the EA's ongoing programme of river catchment studies. The studies can include topographic surveys and hydrological and/or hydraulic modelling as well as incorporating information from recorded flood events.

EA Flood Zone Mapping

Illustrated in Appendix B, Figure 2A-2F with index map 2 for ease of reference.

It should be noted that a separate map is available on the Environment Agency website which is referred to as 'Risk of Flooding from Rivers and Sea'[11]. This map takes into account the presence of flood defences and so describes the actual chance of flooding, rather than the chance if there were no defences present.

While flood defences reduce the level of risk they do not completely remove it as they can be overtopped or fail in extreme weather conditions, or if they are in poor condition. As a result the maps may show areas behind defences which still have some risk of flooding. This mapping has been made available by the Environment Agency as the primary method of communicating flood risk to members of the public, however for planning purposes the 'Flood Map for Planning (Rivers and the Sea)' and associated Flood Zones remains the primary source of information.

The three main rivers noted within section 4.1.1 all have areas of Medium and High probability of flooding from rivers (i.e. Flood Zones 2 and 3) associated with them. These are clearly mapped in Appendix B.

- The floodplain of the Upper Thames affects the southern and south eastern fringe of the district including Kelmscott, Bampton, Chimney, and Northmoor.
- The River Evenlode and the River Windrush flow south eastwards through the district and the floodplains associated with these watercourses affect the settlements of Minster Loveli, Crawley, Witney, Kingham, Ascott-under-Wychwood and Eynsham.

10 Environment Agency Flood Map for Planning (Rivers and Sea) http://apps.environment-agency.gov.uk/wiyby/37837.aspx

11 Environment Agency 'Risk of Flooding from Rivers and Sea' http://watermaps.environment-agency.gov.uk/wiyby/wiyby.aspx?topic=floodmap#x=237038&y=161974&scale=1

4.1.4 Hydraulic Modelling Studies

Table 4.2 below provides a summary of hydraulic modelling studies that have been undertaken for the Main Rivers in West Oxfordshire and used to inform the Flood Map for Planning (Rivers and Sea). Each model was built using ISIS-TUFLOW software to produce a combined 1D/2D model of river flow and floodplain inundation.

Table 4-2 Hydraulic models for Main Rivers in WODC

Watercourse	Modelling Study
River Thames	**Halcrow Group Limited (2013) Thames Main River Limit to St John's Modelling and Mapping** ISIS-TUFLOW (1D/2D) model for the upper reach of the River Thames to St Johns. **Halcrow Group Limited (2010) Thames: St Johns to Evenlode Confluence Flood Risk Mapping Study** ISIS-TUFLOW (1D/2D) model for 46km of the River Thames and 36km of its tributaries – from St Johns to upstream of the confluence with the River Evenlode. **Mott McDonald (2014) Oxford Flood Risk Mapping Study** ISIS-TUFLOW (1D/2D) model for the River Thames from Eynsham Lock to Lower Radley and the River Cherwell from the A40 to its confluence with the River Thames.
River Windrush	**CH2MHILL (2014) Windrush: Worsham to Witney (A40)** ISIS-TUFLOW (1D/2D) model for the effect of new flood defences at six locations between Worsham to Witney along the River Windrush and tributaries. **Mott McDonald (2013) Witney Flood Modelling and Mapping Study** ISIS-TUFLOW (1D/2D) model review of Witney to include all changes to river structures and calculate the standard of protection from flood defences. **Halcrow Group Limited (2010) Thames: St Johns to Evenlode Confluence Flood Risk Mapping Study** ISIS-TUFLOW (1D/2D) model for 55km of the Windrush – from Worsham to the Thames

It should be noted that the scope of these modelling studies typically covers flooding associated with Main Rivers, and therefore Ordinary Watercourses that form tributaries to the Main Rivers may not always be included in the model. Modelling of Ordinary Watercourses available on the Flood Map for Planning (Rivers and Sea) may be the result of the national generalised JFLOW modelling carried out by the Environment Agency and may need to be refined when determining the probability of flooding for an individual site and preparing a site-specific FRA. Further detail is provided in Section 7.3.

4.1.5 Functional Floodplain (Flood Zone 3b)

The Functional Floodplain is defined in the NPPF as 'land where water has to flow or be stored in times of flood'. The Functional Floodplain (also referred to as Flood Zone 3b), is not separately distinguished from Flood Zone 3a on the Flood Map for Planning.

For the purposes of this study the 1 in 20 (5%) flood outline has been used to define the functional floodplain where available. For reaches where this is not available, the 100-year flood outline (i.e. Flood Zone 3a) has been used as a proxy, in line with the guidance contained within the NPPF, until such a time when more detailed information is available (i.e. an EA modelling study or hydraulic modelling undertaken for a site-specific flood risk assessment). This is not to say that the entire area used as a proxy is functional floodplain, rather that the boundary of the functional floodplain falls somewhere within that area as recommended by the EA. This is a common approach in the absence of more detailed modelling information.

Mapping is provided in Appendix B and a description of the functional floodplains associated with main rivers is included below.

- **River Thames -** The majority of the functional floodplain for the River Thames is used as farming land with minimal impact upon settlement areas and villages. The largest area affected by flooding is at the confluence of the River Windrush and River Thames, namely the village of Standlake, where parts of the village have been constructed within the functional floodplain. The use of farming land as functional floodplain provides significant capacity to protect downstream settlements, including Oxford.

- **River Evenlode -** The Evenlode passes the rural service centre of Charlbury as well as several other villages prior to it meeting the River Thames 5km north west of Oxford. There are minimal settlement areas where development has occurred within the functional floodplain of the Evenlode with the main area affected being the Wychwoods.

- **River Windrush** - flows through the centre of Witney, where some of the area now identified as functional floodplain was developed in the past. There is a large capacity within the floodplain upstream of Witney in areas of smaller development such as Crawley and Minster Lovell which acts as a natural defence protecting Witney. The Bridge Street crossing in the centre of Witney and buildings downstream heavily restrict the River Windrush at Witney.[12] The River Windrush catchment has been extensively affected by the construction of mills along the watercourse and gravel extraction from the floodplain.

EA Flood Zone Mapping – functional floodplain
Illustrated in Appendix B, Figure 2A-2F with Index Map 2 for ease of reference.

4.1.6 Dry Islands

The floodplain in West Oxfordshire, particularly along the River Thames and the eastern portion of River Windrush, is relatively flat and broad. There may be small areas within the floodplain where the ground levels are slightly higher and which are therefore less likely to flood than the land around them. These areas are typically referred to as 'dry islands'. These areas can sometimes be identified by looking at the Flood Zone map; for example an area of Flood Zone 1 or 2, surrounded by land designated as Flood Zone 3. When considering the flood risk to these areas, the risk to the surrounding area should be taken into account.

4.1.7 Climate Change

Due to the recent update to climate change allowances, previous hydraulic modelling of climate change is now outdated, therefore re-modelling with adjusted climate change estimates is required. However, this is a lengthy process and therefore for the purpose of this SFRA the Environment Agency agreed that the 0.1% AEP (1in 1000 year) outline (Flood Zone 2) should be applied to the flood maps as a conservative estimate for climate change, unless a developer can prove otherwise through further modelling.

For further guidance on climate allowances and new developments refer to **Appendix A.**

Climate Change outline = 0.1% AEP (Flood Zone 2)
Illustrated in Appendix B, Figure 2A-2F with Index Map 2 for ease of reference.

4.2 Flooding from Land (pluvial/surface water flooding and overland flow)

4.2.1 Overview

Intense rainfall, often of short duration, that is unable to soak into the ground or enter drainage systems can run off land quickly and result in local flooding. During such rainfall events, flow from adjacent higher ground may 'pond' in low-lying areas of land without draining into watercourses, surface water drainage systems or the ground.

One of the main issues with pluvial flooding is that in areas with no history of flooding relatively small changes to hard surfacing and surface gradients can cause flooding (garden loss and reuse of brownfield sites for example). As a result, continuing development could mean that pluvial and surface water flooding can become more frequent and, although not on the same scale as fluvial flooding, it can still cause significant disruption

WODC is largely rural although it still experiences flooding from overland flow, highlighted by the flood event of July 2007. Rural roads can become impassable due to overland flow and properties have been flooded directly. Changes in

12 Witney Flood Review July 2007, EA

farming practices can exacerbate overland flow due to the removal of hedgerows and trees and the issue is likely to become increasingly important due to climate change.

4.2.2 'Updated Flood Map for Surface Water'

The EA has undertaken modelling of surface water flood risk at a national scale and produced mapping identifying those areas at risk of surface water flooding during three probability events: 3.33% annual probability (1 in 30 year), 1% annual probability (1 in 100 year) and 0.1% annual probability (1 in 1,000 year). The latest version of the mapping is referred to as the 'updated Flood Map for Surface Water' (uFMfSW) and the extents have been made available to WODC as GIS layers. This dataset is also available nationally on the Environment Agency website, and is referred to as 'Risk of Flooding from Surface Water'13. For the purposes of this SFRA, the mapping allows an improved understanding of areas within WODC administrative area which may be at risk of flooding from surface water.

Appendix B, Figures 5A-5F with an index provided in Figure 5

It should be noted that this national mapping, largely due to its National Scale has the following limitations:

- Use of a single drainage rate for all urban areas,
- It does not show the susceptibility of individual properties to surface water flooding,
- The mapping has significant limitations for use in flat catchments,
- No explicit modelling of the interaction between the surface water network, the sewer systems and watercourses,
- In a number of areas, modelling has not been validated due to a lack of surface water flood records, and
- As with all models, the uFMfSW is affected by a lack of, or inaccuracies, in available data.

4.2.3 Climate Change

The uFMfSW does not include a specific scenario to determine the impact of climate change on the risk of surface water flooding. However a range of three annual probability events have been undertaken, 3.3%, 1% and 0.1% and therefore it is possible to use with caution the 0.1% outline as a substitute dataset to provide an indication of the implications of climate change.

4.3 Flooding from Groundwater

4.3.1 Overview

In broad terms there is limited potential for groundwater flooding in the central and northern part of the district including Chipping Norton. The potential for groundwater flooding is greater in Carterton, Witney, Eynsham and Woodstock where the underlying geological conditions are more permeable.

4.3.2 Bedrock and Superficial Geology

The character of West Oxfordshire is predominantly based around the underlying geology and is split into four distinct character areas namely Thames Vale, Limestone Wolds, Ironstone Valleys and Ridges and the Northern Valleys and Ridges.

Groundwater flooding usually occurs in low lying areas underlain by permeable rock and aquifers that allow groundwater to rise to the surface through the permeable subsoil following long periods of wet weather. Low lying areas may be more susceptible to groundwater flooding because the water table is usually at a much shallower depth and groundwater paths tend to travel from high to low ground.

Two data sets were supplied for the SFRA by the BGS regarding the underlying geology including both bedrock and superficial geology. Bedrock is the consolidated rock underlying the ground surface. Superficial deposits refer to the more geologically recent deposits (typically of Quaternary age) that may be present above the bedrock such as floodplain deposits, beach sands and glacial drift.

Bedrock and Superficial Geology Mapping

Refer to Figures 3A-D (Superficial Geology) and 4A-D (Bedrock Geology) Appendix B

13 Environment Agency Flood Risk from Surface Water Map http://watermaps.environment-agency.gov.uk/wiyby/wiyby.aspx?&topic=ufmfsw#x=357683&y=355134&scale=2

4.3.3 Susceptibility to Groundwater Flooding

'Susceptibility to Groundwater Flooding' is a dataset produced by the BGS showing areas susceptible to groundwater flooding on the basis of geological and hydrogeological conditions. This layer is divided into three classes – High, Medium and Low risk. The highest risk areas are those with the potential for groundwater flooding to occur at the surface, medium risk are those which may experience groundwater flooding of property situated below the ground surface i.e. basements; and low risk are those with limited potential for groundwater flooding to occur.

Areas Susceptible to Groundwater Flooding - Refer to Figure 6 Appendix B

4.3.4 Aquifers

The bedrock underlying the central part of the District including Chipping Norton, Charlebury and Woodstock is designated a principal aquifer. This is defined by the Environment Agency as having intergranular permeability, which can provide a high level of water storage, and support water supply and/ or river base flow on a strategic scale.

A band of bedrock stretching from Witney to Lechlade on Thames is designated a secondary aquifer. This is defined by the Environment Agency as a permeable layer capable of supporting water supplies at a local rather than strategic scale and in some cases forming an important source of base flow to rivers. The remainder of the District to the south is designated unproductive strata which is rock strata with low permeability that has negligible significance for water supply or river base flow.

The superficial deposits present along the corridor of the River Thames, River Windrush and River Evenlode are classified as a secondary aquifer.

4.3.5 Groundwater Vulnerability

In a similar manner to the geological conditions and aquifer designations, the corridor adjacent to the River Thames is designated a Minor Aquifer High, the River Windrush classified as a Major Aquifer High west of Witney and Minor Aquifer High south east of Witney, and the River Evenlode a combination of Minor Aquifer High and Major Aquifer High on the Groundwater Vulnerability mapping.

Generally speaking, the central and northern parts of the district are classified as a Major Aquifer High and the southern portion, south of Witney, is classified as a Minor Aquifer High. Major aquifers are Principal Aquifers are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. Minor aquifers include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage.

The EA defines Source Protection Zones (SPZ) around all major public and private water supply abstractions in order to safeguard groundwater resources from potentially polluting activities. There is only one small area defined as a SPZ in the district which is Chipping Norton.

4.4 Flooding From Sewers

4.4.1 Overview

Sewer flooding generally results in localised short term flooding caused by intense rainfall events overloading the capacity of sewers. Flooding can also occur as a result of blockage, poor maintenance or structural failure.

It should be noted that much of the sewer network dates back to Victorian times, some of which is of unknown capacity and condition. More recent sewers are likely to have been designed to the guidelines in 'Sewers for Adoption' (WRC, 2006). These sewers tend to have a design standard of up to the 1 in 30 year storm event (equating to approximately a 1 in 5 year flood flow), although in many cases, it is thought that this design standard is not achieved, especially in privately owned systems.

It is therefore likely that parts of the sewer system will surcharge during large, high intensity rainstorm events resulting in frequent flooding, particularly if the systems are combined and if climate change forecasts are correct. Due to the limited capacities and design standards, the level of risk posed by and probability of sewer flooding is therefore greater than that of fluvial flooding, where the SFRA examines the 1 in 100 and 1 in 1000 year return periods.

In addition, as towns and villages expand to accommodate growth, the original sewer systems are rarely upgraded, eventually becoming overloaded and reducing their efficiency. A number of Parishes in West Oxfordshire regularly experience sewer flooding due to surface water connections to foul water systems. These problems have been documented in individual Parish Flood Defence Reports produced by WODC as a response to the flooding of Summer 2007.

Compounding this problem are the effects of climate change. Climate change is forecast to result in milder and wetter winters and more thunderstorms in summer months. This combination will increase the pressure on existing sewer systems effectively reducing their capacity, leading to more frequent flooding.

During heavy rainfall, flooding from the sewer system may occur if:

1) The rainfall event exceeds the capacity of the sewer system/drainage system:
   - Sewer systems are typically designed and constructed to accommodate rainfall events with an annual probability of 3.3% (1 in 30 chance each year) or greater. Therefore, rainfall events with an annual probability less than 3.3% would be expected to result in surcharging of some of the sewer system. While TWUL, as the sewerage undertaker for West Oxfordshire, recognise the impact that more extreme rainfall events may have, it is not cost beneficial to construct sewers that could accommodate every extreme rainfall event
2) The system becomes blocked by debris or sediment:
   - Over time there is potential that road gullies and drains become blocked from fallen leaves, build-up of sediment and debris (e.g. litter).
3) The system surcharges due to high water levels in receiving watercourses:
   - Within the study area there is potential for surface water outlets to become submerged due to high river levels. When this happens, water is unable to discharge. Once storage capacity within the sewer system itself is exceeded, the water will overflow into streets and potentially into houses. Where the local area is served by 'combined' sewers i.e. containing both foul and storm water, if rainfall entering the sewer exceeds the capacity of the combined sewer and storm overflows are blocked by high water levels in receiving watercourses, surcharging and surface flooding may again occur but in this instance floodwaters will contain untreated sewage.

4.4.2 Thames Water DG5

Appendix B Figures B7 and B8 show the DG5 Register (register of properties which have experienced sewer flooding More frequently than once in 20 years) that has been supplied by Thames Water.

It should be noted that these are flooding incidents that have been reported to TWUL by the home owners. There are obviously incidents that don't get reported and therefore will not show on the register. Incidents of sewer flooding can be retrospectively reported to TWUL via their website – http://thameswater.co.uk/help-and-advice/9782.htm.

This dataset identifies that 8 properties have been affected by internal flooding in the areas of Ducklington and Standlake with several other incidents occurring throughout the district. External flooding has affected a broader area, with Bampton being the area with most properties affected (25).

Historical Sewer Flooding Incidents are mapped in Appendix B, Figure 7

4.5 Flooding from Reservoirs, Canals and other artificial sources

4.5.1 Infrastructure Failure

4.5

Flooding may result from the failure of engineering installations including flood defence, land drainage pumps, sluice gates and floodgates. Hard defences may fail through the slow deterioration of structural components such as the rusting of sheet piling, erosion of concrete reinforcement and toe protection or the failure of ground anchors. This deterioration can be difficult to detect, so that failure when it occurs is often sudden and unexpected. Failure is more likely when the structure is under maximum stress, such as extreme fluvial events when pressures on the structure are at its most extreme.

Reservoirs in the UK have an extremely good safety record. The EA is the enforcement authority for the Reservoirs Act 1975 in England and Wales. All large reservoirs must be inspected and supervised by reservoir panel engineers. It is assumed that these reservoirs are regularly inspected and essential safety work is carried out. These reservoirs therefore present a minimal risk. However, the NPPG encourages LPAs to identify any impounded reservoirs and evaluate how they might modify the existing flood risk in the event of a flood in the catchment it is located within, and / or whether emergency draw-down of the reservoir will add to the extent of flooding.

Reference has been made to the EA dataset 'Risk of Flooding from Reservoirs' which identifies areas that could be flooded if a large[14] reservoir were to fail and release the water it holds. The mapping shows the part of the district to the east of Stanton Harcourt to be at risk from six reservoirs, namely Blenheim Lake, Blandon Lake, Scott's House Lake, Farmoor No 1, Farmoor No 2 and Beacon Hill; additionally areas east of Kelmscott to Buckland Road are at risk from flooding due to two reservoirs Buscot Reservoir and Buscot Park Lake and areas south of Foscot at risk of flooding from the Sarsden Lake.

WODC is responsible for working with members of the Local Resilience Forum (LRF) to develop emergency plans for reservoir flooding and ensuring communities are well prepared.

4.6 Flood Risk Management

4.6.1 Flood Defences Overview

The EA Asset Information Management System (AIMS) contains details of flood defence assets associated with Main Rivers. This dataset shows that the majority of the watercourses in WODC are not formally defended but may be informally protected by high ground on either side of the watercourse. A list of all recorded flood assets in presented in Appendix G.

The defences in WODC offer a standard of protection ranging from 2 to 100 years. Defences designed to a 100 year standard are found along the Upper Thames and are maintained by the EA, such defences include flood walls, embankments and stone revetments. Many of the other fluvial defences across WODC have a design standard less than 50 years; therefore a flood event of this magnitude would be expected to result in flooding despite the presence of a flood defence. Potential development should not rely on these defences for long-term protection.

With this in mind the efficient operation of channels and culverts is paramount if the existing standard of flood defence is to be maintained for the study area. This requires maintenance by the defence owners which includes the EA, WODC and riparian owners or by the responsible drainage authority where appropriate remedial action does not take place.

The location of existing flood defences are mapped in Appendix B, Figures 2A-F with overview Map 2

4.6.2 Thames Catchment Flood Management Plan (CFMP)

The CFMP provides an overview of the flood risk in the Thames catchment and sets out the preferred plan for sustainable flood risk management over the next 50 to 100 years. It identifies flood risk management policies to assist all key decision makers in the catchment including LPAs who can use the plan to inform spatial planning activities and emergency planning. The CFMP sets out the preferred policy for different sub-areas of the catchment that have been identified by their physical characteristics. WODC falls into the 'Upper Thames' catchment as described in Table 4-3 below.

14 A large reservoir is one that holds over 25,000 cubic metres of water, equivalent to approximately 10 Olympic sized swimming pools.

Table 4-3 Catchment Flood Management Plan

Upper Thames – 'Towns and villages in open floodplain (north and west)'. **Preferred Policy P6 'Areas of low to moderate flood risk where we will take action with others to store water or manage run-off in locations that provide overall flood risk reduction or environmental benefits.'**
Environment Agency's Proposed Actions: • We want to maintain the existing capacity of the river systems in developed areas that reduces the risk of flooding from more frequent events. • We will identify locations where the storage of water could benefit communities by reducing flood risk and providing environmental benefits (by increasing the frequency of flooding) and encourage flood compatible land uses and management. For example in the Roding catchment, planned flood storage will reduce the risk to local communities and larger urban areas downstream. • We will work with Local Planning Authorities to retain the remaining floodplain for uses that are compatible with flood risk management and put in place polices that lead to long-term adaptation of urban environments in flood risk areas. • We will continue to increase public awareness, including encouraging people to sign-up for the free Floodline Warnings Direct service. • We will help communities and local authorities manage local flood risk. This could include flood resilience (for example in Witney and Bampton), community flood plans that identify vulnerable people and infrastructure and community based projects (for example in East Hanney).

4.6.3 Flood Warning Areas

The EA operates a free Flood Warning Service[15] for many areas at risk of flooding from rivers and the sea. Each river is divided into Flood Warning Areas by the EA, each described with 'River name – upstream to downstream description – city/town/village'.

As an example, coverage of flood warning areas for River Windrush and River Evenlode catchment include:

- River Windrush and its tributaries from Worsham to Newbridge including Witney, Hardwick and Standlake;
- River Evenlode and its tributaries from Moreton-in-Marsh to Shipton-under-Wychwood, including Bledington and Milton-under-Wychwood.

Information on flood warnings in force and flood warning areas can be found on the gov.uk website, available at: https://flood-warning-information.service.gov.uk/river-and-sea-levels.

Flood Warning Areas across WODC are mapped in Figure 8 Appendix B

4.6.4 Residual Risk

It is important to recognise that the risk of flooding from the rivers in West Oxfordshire can never be fully mitigated, and there will always be a residual risk of flooding that will remain after measures have been implemented to protect an area or a particular site from flooding. This residual risk is associated with a number of potential risk factors including (but not limited to):

- A flooding event that exceeds that for which the flood risk management measures have been designed e.g. flood levels above the designed finished floor levels;
- The structural deterioration of flood defence structures (including informal structures acting as a flood defence) over time, and/or;
- General uncertainties inherent in the prediction of flooding.

The modelling of flood flows and flood levels is not an exact science, therefore there are inherent uncertainties in the prediction of flood levels used in the assessment of flood risk. Whilst the NPPF Flood Zones provide a relatively robust

15Environment Agency Flood Warning Service http://apps.environment-agency.gov.uk/wiyby/37835.aspx

depiction of flood risk for specific conditions, all modelling requires the making of core assumptions and the use of empirical estimations relating to (for example) rainfall distribution and catchment response.

Steps should be taken to manage these residual risks through the use of flood warning and evacuation procedures, as described in Section 8.5.

5 Potential Development Pressures in West Oxfordshire

A suitable level 1 SFRA will collate and review existing information on flooding sources and flood risk to assist the LPA in its obligation to consider flood risk in strategic land allocations and in developing future policies. The level 1 SFRA will achieve this by providing sufficient information to enable WODC to apply the Sequential Test and Exception Tests as outlined in NPPF.

In accordance with NPPF if there are no reasonably available sites in Flood Zone 1, it may be necessary to locate development in Flood Zone 2 potentially through the successful application of the Exception Test. Only where there are no reasonably available sites in Flood Zone 1 and 2 should development be located in Flood Zone 3 and where necessary, successful application of the Exception Test will require information to be provided in a Level 2 SFRA.

As outlined in the draft local plan the District has been divided into five sub-areas based on landscape characteristics and local catchments for key services and facilities these are:

- Witney Sub Area
- Carterton Sub Area
- Chipping Norton Sub Area
- Eynsham – Woodstock Sub Area
- Burford – Charlbury Sub Area

For the purposes of this SFRA, flood risk has been reviewed against these 5 sub-areas and a 'Flood Risk Settlement Assessment' is included for each within Appendix D.

6 Avoiding Flood Risk

6.1 NPPF Sequential Approach

This Section guides the application of the Sequential Test and Exception Test in the Plan-making and planning application processes. Not all development will be required to undergo these tests, as described below, but may still be required to undertake a site specific FRA, guidance about which is included in Section 7.

The sequential approach is a decision-making tool designed to ensure that sites at little or no risk of flooding are developed in preference to sites at higher risk. This will help avoid the development of sites that are inappropriate on flood risk grounds. The subsequent application of the Exception Test where required will ensure that new developments in flood risk areas will only occur where flood risk is clearly outweighed by other sustainability drivers.

The sequential approach can be applied at all levels and scales of the planning process, both between and within Flood Zones. All opportunities to locate new developments (except Water Compatible) in reasonably available areas of little or no flood risk should be explored, prior to any decision to locate them in areas of higher risk.

The Sequential Test will be prepared by WODC as part of the Evidence Base for sites allocated in the Local Plan.

6.2 Applying Sequential Test – Plan-Making

It should be demonstrated that a range of possible sites have been considered in conjunction with the Flood Zone and vulnerability information from the SFRA, applying the Sequential Test, and where necessary, the Exception Test, in the site allocation process. Figure 6-1 illustrates the approach for applying the Sequential Test that WODC should adopt in the allocation of sites as part of the preparation of the West Oxfordshire Local Plan. The Sequential Test should be undertaken by WODC and accurately documented to ensure decision processes are consistent and transparent.

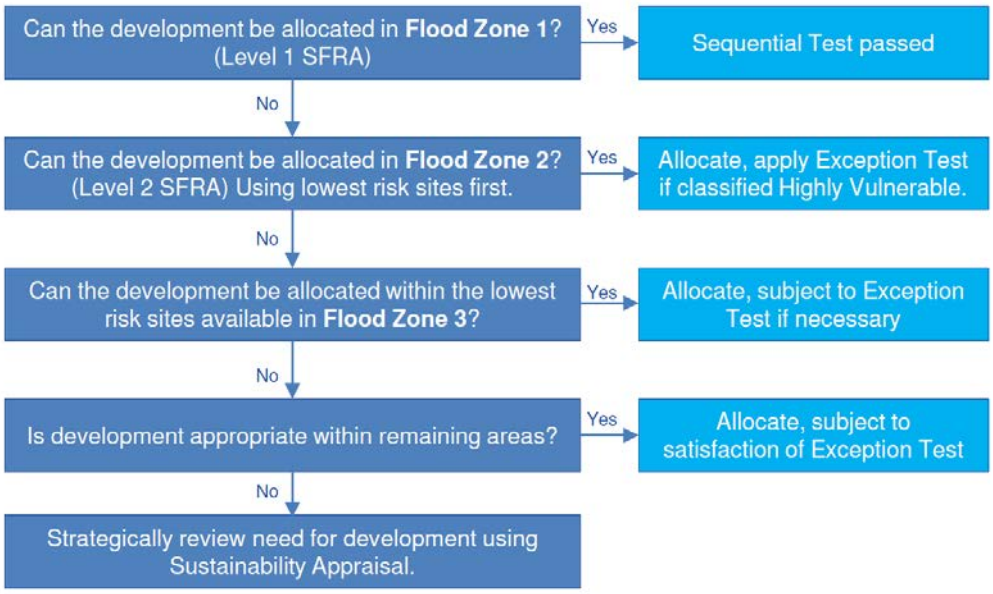


Figure 6-1 Application of Sequential Test for Plan-Making

The Sequential Test requires an understanding of the Flood Zones in the study area and the vulnerability classification of the proposed developments. Flood Zone definitions are provided in Table 5.1 and mapping included in Appendix B (and the Flood Map for Planning (Rivers and Sea) on the EA website). Flood risk vulnerability classifications, as defined in the NPPG are presented in Table 6-1 below.

Table 6-1 Flood Risk Vulnerability Classification (PPG, 2014)

Vulnerability Classification	Development Uses
Essential Infrastructure	• 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	• 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. (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”).
More Vulnerable	• 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. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable	• Police, ambulance and fire stations which are not required to be operational during flooding. • Buildings used for shops, financial, professional and other services, restaurants and cafes, hot food takeaways, offices, general industry, storage and distribution, non–residential institutions not included in “more vulnerable“, and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment works which do not need to remain operational during times of flood. • Sewage treatment works (if adequate measures to control pollution and manage sewage during flooding events are in place).
Water-Compatible Development	• Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves. • Navigation facilities. • MOD defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

NPPF acknowledges that some areas will (also) be at risk of flooding from sources other than fluvial. All sources must be considered when planning for new development including: flooding from land or surface water runoff; groundwater; sewers; and artificial Sources.

If a location is recorded as having experienced repeated flooding from the same source this should be acknowledged within the Sequential Test.

Table 6-2 Flood Risk Vulnerability and Flood Zone 'Compatibility' (Planning Practice Guidance, 2014)

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

✓ - Development is appropriate × - Development should not be permitted

* In Flood Zone 3b (functional floodplain) essential infrastructure that has to be there and has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

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

[1]There are some areas within Flood Zone 3b that are already developed and are prevented from flooding by the presence of existing infrastructure or solid buildings. Whilst these areas will be subject to frequent flooding it may not be practical to refuse all future development. In recognition of this, WODC has put in place an approach to prevent the unnecessary blight of these areas. See Section 3 for further details.

6.2.1 Recommended stages for LPA application of the Sequential Test in Plan-Making

The information required to address many of these steps is provided in the accompanying maps presented in Appendix B. When preparing a Local Plan a database of the potential allocation sites across West Oxfordshire should be generated and information for each site populated using the GIS layers presented in the maps. This database can be used by WODC when applying the steps below.

1) Assign potential developments with a vulnerability classification (Table 6-1). Where development is mixed, the development should be assigned the highest vulnerability class of the developments proposed.
2) The location and identification of potential development should be recorded.
3) The Flood Zone classification of potential development sites should be determined based on a review of the Flood Map for Planning (Rivers and Sea). Where these span more than one Flood Zone, all zones should be noted, preferably using percentages.
4) The design life of the development should be considered with respect to climate change:
   - 100 years – up to 2115 for residential developments; and
   - 75 years – up to 2090 for commercial / industrial developments, or other time horizon specific to the non-residential use proposed.
5) Identify existing flood defences serving the potential development sites. However, it should be noted that for the purposes of the Sequential Test, Flood Zones ignoring defences should be used.

6) Highly Vulnerable developments to be accommodated within the district should be located on those sites identified as being within Flood Zone 1. If these cannot be located in Flood Zone 1, because the identified sites are unsuitable or there are insufficient sites in Flood Zone 1, sites in Flood Zone 2 can then be considered. If sites in Flood Zone 2 are inadequate then additional sites in Flood Zones 1 or 2 may need to be identified to accommodate development or opportunities sought to locate the development outside the district.

7) Once all Highly Vulnerable developments have been allocated to a development site, consideration can be given to those development types defined as More Vulnerable. In the first instance, More Vulnerable development should be located on sites in Flood Zone 1. Where these sites are unsuitable or there are insufficient sites remaining, sites in Flood Zone 2 can be considered. If there are insufficient sites in Flood Zone 1 or 2 to accommodate More Vulnerable development, sites in Flood Zone 3a can be considered. More Vulnerable developments in Flood Zone 3a will require application of the Exception Test.

8) Once all More Vulnerable developments have been allocated to a development site, consideration can be given to those development types defined as Less Vulnerable. In the first instance Less Vulnerable development should be located on sites in Flood Zone 1, continuing sequentially with Flood Zone 2, then 3a. Less Vulnerable development types are not appropriate in Flood Zone 3b – Functional Floodplain.

9) Essential Infrastructure should be preferentially located in the lowest flood risk zones, however this type of development may be located in Flood Zones 3a and 3b, provided the Exception Test is satisfied.

10) Water Compatible development has the least constraints with respect to flood risk and it is considered appropriate to allocate these sites last. The sequential approach should still be followed in the selection of sites; however it is appreciated that Water Compatible development by nature often relies on access and proximity to water bodies.

11) On completion of the Sequential Test, consideration may need to be given to the risks posed to a site within a Flood Zone in more detail in a Level 2 SFRA. By undertaking the Exception Test, this more detailed study should consider the detailed nature of flood hazard to allow a sequential approach to site allocation within a Flood Zone. Consideration of flood hazard within a flood zone would include:

    - flood risk management measures,
    - the rate of flooding,
    - flood water depth,
    - flood water velocity.

Where the development type is Highly Vulnerable, More Vulnerable, Less Vulnerable or Essential Infrastructure and a site is found to be impacted by a recurrent flood source (other than tidal or fluvial), the site and flood sources should be investigated further regardless of any requirement for the Exception Test.

6.2.2 Windfall Sites

Windfall sites are those which have not been specifically identified as available in the Local Plan process. They comprise sites that have unexpectedly become available. In cases where development needs cannot be fully met through the provision of site allocations, a realistic allowance for windfall development should be assumed, based on past trends. It is recommended that the acceptability of windfall applications in flood risk areas should be considered at the strategic level through a policy setting out broad locations and quantities of windfall development that would be acceptable or not in Sequential Test terms.

6.3 Applying Sequential Test – Planning Applications

It is necessary to undertake a sequential test for a planning application if both of the following apply:

1. The proposed development is in Flood Zone 2 or 3.
2. A sequential test hasn't already been done for a development of the type you plan to carry out on your proposed site (check with WODC).

The Environment Agency publication 'Demonstrating the flood risk Sequential Test for Planning Applications[16]' sets out the procedure for applying the sequential test to individual applications as follows:

- Identify the geographical area of search over which the test is to be applied; this could be the district area, or a specific catchment if this is appropriate and justification is provided (e.g. school catchment area or the need for affordable housing within a specific area).
- Identify the source of 'reasonably available' alternative sites; usually drawn from evidence base / background documents produced to inform the Local Plan.

16 Environment Agency, April 2012, 'Demonstrating the flood risk Sequential Test for Planning Applications', Version 3.1

- State the method used for comparing flood risk between sites; for example the Environment Agency Flood Map for Planning, the SFRA mapping, site-specific FRAs if appropriate, other mapping of flood sources.
- Apply the Sequential Test; systematically consider each of the available sites, indicate whether the flood risk is higher or lower than the application site, state whether the alternative option being considered is allocated in the Local Plan, identify the capacity of each alternative site, and detail any constraints to the delivery of the alternative site(s).
- Conclude whether there are any reasonably available sites in areas with a lower probability of flooding that would be appropriate to the type of development or land use proposed.
- Where necessary, as indicated by Table 6-2, apply the Exception Test.
- Apply the Sequential approach to locating development within the site, as described in Section 6.3.

It should be noted that it is for WODC, taking advice from the EA as appropriate, to consider the extent to which Sequential Test considerations have been satisfied, taking into account the particular circumstances in any given case. The developer should justify with evidence what area of search has been used when making the application.

Ultimately, after applying the Sequential Test, WODC needs to be satisfied in all cases that the proposed development would be safe and not lead to increased flood risk elsewhere. This needs to be demonstrated within a FRA (see Section 0) and is necessary regardless of whether the Exception Test is required.

6.3.1 Sequential Test Exceptions

It should be noted that the Sequential Test does not need to be applied in the following circumstances:

- Individual developments proposed on sites which have been allocated in development plans through the Sequential Test.
- Minor development, which is defined in the NPPF as:
    - minor non-residential extensions: industrial / commercial / leisure etc. extensions with a footprint <250m^2.
    - alterations: development that does not increase the size of buildings e.g. alterations to external appearance.
    - householder development: for example; sheds, garages, games rooms etc. within the curtilage of the existing dwelling, in additional to physical extensions to the existing dwelling itself. This definition excludes any proposed development that would create a separate dwelling within the curtilage of the existing dwelling e.g. subdivision of houses into flats.
- Change of Use applications, unless it is for a change of use of land to a caravan, camping or chalet site, or to a mobile home site or park home site.
- Development proposals in Flood Zone 1 (land with a low probability of flooding from rivers or the sea) unless the SFRA, or other more recent information, indicates there may be flooding issues now or in the future (for example, through the impact of climate change).
- Redevelopment of existing properties (e.g. replacement dwellings), provided they do not increase the number of dwellings in an area of flood risk (i.e. replacing a single dwelling within an apartment block).

6.4 NPPF Exception Test

The purpose of the Exception Test is to ensure that, following the application of the Sequential Test, new development is only permitted in Flood Zone 2 and 3 where flood risk is clearly outweighed by other sustainability factors and where the development will be safe during its lifetime, considering climate change.

For the Exception Test to be passed:

- **Part 1** - It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by the SFRA where one has been prepared; and
- **Part 2 -** A site-specific Flood Risk Assessment must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

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

7 Guidance for Site-Specific FRAs

7.1 What is a Flood Risk Assessment

A site-specific FRA is a report suitable for submission with a planning application which provides an assessment of flood risk to and from a proposed development, and demonstrates how the proposed development will be made safe, will not increase flood risk elsewhere and where possible will reduce flood risk overall in accordance with Local Plan Policy EH5 – Flood Risk, paragraph 100 of the NPPF and PPG. An FRA must be prepared by a suitably qualified and experienced person and must contain all the information needed to allow WODC to satisfy itself that the requirements have been met.

7.2 When is a Flood Risk Assessment required?

The NPPF states that a site-specific FRA is required in the following circumstances:

- Proposals for new development (including minor development[18] and change of use) in Flood Zones 2 and 3.
- Proposals for new development (including minor development and change of use) in an area within Flood Zone 1 which has critical drainage problems (as notified to the LPA by the Environment Agency)[19].
- Proposals of 1 hectare or greater in Flood Zone 1.
- Where proposed development or a change of use to a more vulnerable class may be subject to other sources of flooding.

7.3 How detailed should a FRA be?

FRAs should be proportionate to the degree of flood risk, the scale and nature of the development, its vulnerability classification (Table 6-1) and the status of the site in relation to the Sequential and Exception Tests. Site-specific FRAs should also make optimum use of readily available information, for example the mapping presented within this SFRA and available on the EA website, although in some cases additional modelling or detailed calculations will need to be undertaken.

For example, where the development is an extension to an existing house (for which planning permission is required) which would not significantly increase the number of people present in an area at risk of flooding, WODC would generally need a less detailed assessment to be able to reach an informed decision on the planning application. For a new development comprising a greater number of houses in a similar location, or one where the flood risk is greater, WODC may require a more detailed assessment, for example, the preparation of site-specific hydraulic modelling to determine the flood risk to and from the site pre and post-development, and the effectiveness of any management and mitigation measures incorporated within the design.

As a result, the scope of each site-specific FRA will vary considerably. Table 8.1 presents the different levels of site-specific FRA as defined in the CIRIA publication C624[22] and identifies typical sources of information that can be used. Sufficient information must be included to enable the Council and where appropriate, consultees, to determine that the proposal will be safe for its lifetime, not increase flood risk elsewhere and where possible, reduce flood risk overall. Failure to provide sufficient information will result in applications being refused.

18 According to the PPG, minor development means:

minor non-residential extensions: industrial / commercial / leisure etc. extensions with a footprint <250m2.

alterations: development that does not increase the size of buildings e.g. alterations to external appearance.

householder development: for example; sheds, garages, games rooms etc. within the curtilage of the existing dwelling, in addition to physical extensions to the existing dwelling itself. This definition excludes any proposed development that would create a separate dwelling within the curtilage of the existing **dwelling** e.g. subdivision of houses into flats.

19 Consultation has confirmed that there are no areas with critical drainage problems identified by the Environment Agency.

22 CIRIA, 2004, Development and flood risk – guidance for the construction industry C624.

Table 7-1 Levels of Site-Specific Flood Risk Assessment

Level 1 Screening	Identify whether there are any flooding or surface water management issues related to a development site that may warrant further consideration. This should be based on readily available existing information. The screening study will ascertain whether a FRA Level 2 or 3 is required. Typical sources of information include: • WODC SFRA • Flood Map for Planning (Rivers and Sea) • EA Standing Advice NPPF Tables 1, 2 and 3
Level 2 Scoping	Undertaken if the Level 1 FRA indicates that the site may lie within an area that is at risk of flooding, or the site may increase flood risk due to increased run-off. This study should confirm the sources of flooding which may affect the site. The study should include: • An appraisal of the availability and adequacy of existing information; • A qualitative appraisal of the flood risk posed to the site, and potential impact of the development on flood risk elsewhere; and • An appraisal of the scope of possible measures to reduce flood risk to acceptable levels. The scoping study may identify that sufficient quantitative information is already available to complete a FRA appropriate to the scale and nature of the development. Typical **sources of information** include those listed above, plus: • Local policy statements or guidance. • Lower Thames Catchment Flood Management Plan. • Oxfordshire County Council PFRA and LFRMS. • Data request from the EA to obtain result of existing hydraulic modelling studies relevant to the site and outputs such as maximum flood level, depth and velocity. • Consultation with EA/OCC/sewerage undertakers and other flood risk consultees to gain information and to identify in broad terms, what issues related to flood risk need to be considered including other sources of flooding. • Historic maps. • Interviews with local people and community groups. • Walkover survey to assess potential sources of flooding, likely routes for floodwaters, the key features on the site including flood defences, their condition. • Site survey to determine general ground levels across the site, levels of any formal or informal flood defences
Level 3 Detailed	To be undertaken if a Level 2 FRA concludes that further quantitative analysis is required to assess flood risk issues related to the development site. The study should include: • Quantitative appraisal of the potential flood risk to the development; • Quantitative appraisal of the potential impact of the development site on flood risk elsewhere; and • Quantitative demonstration of the effectiveness of any proposed mitigations measures. Typical **sources of information** include those listed above, plus: • Detailed topographical survey. • Detailed hydrographic survey. • Site-specific hydrological and hydraulic modelling studies which should include the effects of the proposed development. • Monitoring to assist with model calibration/verification. • Continued consultation with the LPA, Environment Agency and other flood risk consultees.

7.3.1 Environment Agency Data Requests

The EA offers a series of 'products' for obtaining flood risk information suitable for informing the preparation of site-specific FRAs as described on their (website wtenquiries@environment-agency.gov.uk).

- **Products 1 – 4** relate to mapped deliverables including flood level and flood depth information and the presence of flood defences local to the proposed development site;
- **Product 5** contains the reports for hydraulic modelling of the Main Rivers;
- **Product 6** contains the model output data so the applicant can interrogate the data to inform the FRA.
- **Product 7** comprises the hydraulic model itself.

Products 1 – 6 can be used to inform a Level 2 FRA. In some cases, it may be appropriate to obtain Product 7 and to use as the basis for developing a site-specific model for a proposed development as part of a Level 3 FRA. This can be requested via either their National Customer Contact Centre via enquiries@environment-agency.gov.uk or the Customer and Engagement Team via KSLEnquiries@environment-agency.gov.uk.

7.3.2 Modelling of Ordinary Watercourses

It should be noted that the scope of modelling studies undertaken by the EA typically cover flooding associated with Main Rivers, and therefore Ordinary Watercourses that form tributaries to the Main Rivers may not always be included in the model. Where a proposed development site is in close proximity to an Ordinary Watercourse and either no modelling exists, or the available modelling is considered to provide very conservative estimates of flood extents (due to the use of national generalised JFLOW modelling), applicants may need to prepare a simple hydraulic model to enable more accurate assessment of the probability of flooding associated with the watercourse and to inform the site-specific FRA. This should be carried out in line with industry standards and in agreement with the EA and Oxfordshire County Council (as the LLFA).

7.4 What needs to be addressed in a Flood Risk Assessment?

The PPG states that the objectives of a site-specific flood risk assessment are to establish:

- Whether a proposed development is likely to be affected by current or future flooding from any source;
- Whether it will increase flood risk elsewhere;
- Whether the measures proposed to deal with these effects and risks are appropriate;
- The evidence for the local planning authority to apply (if necessary) the Sequential Test, and;
- Whether the development will be safe and pass the Exception Test, if applicable.

7.5 Flood Risk Assessment Checklist

Table 7-2 provides a checklist for site-specific FRAs including the likely information that will need to be provided along with references to sources of relevant information. As described in Section 8.3, the exact level of detail required under each heading will vary according to the scale of development and the nature of the flood risk. It is expected that this Checklist is completed for all planning applications. This will be a validation requirement once the Council has updated its validation checklist and proposals that are submitted without the completed Checklist will be regarded as invalid.

Table 7-2 Site-Specific Flood Risk Assessment Checklist

What to Include in a site specific FRA		Source(s) of Information
1.Site Description		
Site address	-	-
Site description	-	-
Location plan	*Including geographical features, street names, catchment areas, watercourses and other bodies of water*	*SFRA Appendix B*
Site plan	*Plan of site showing development proposals and any structures which may influence local hydraulics e.g. bridges, pipes/ducts crossing watercourses, culverts, screens, embankments, walls, outfalls and condition of channel*	*OS Mapping* *Site Survey*
Topography	*Include general description of the topography local to the site. Where necessary, site survey may be required to confirm site levels (in relation to Ordnance datum).* *Plans showing existing and proposed levels.*	*SFRA Appendix B,* *Site Survey*
Geology	*General description of geology local to the site.*	*SFRA Appendix B* *Ground Investigation Report*
Watercourses	*Identify Main Rivers and Ordinary Watercourses local to the site.*	*SFRA Appendix B*
Status	*Is the development in accordance with the Council's Spatial*	http://planningconsultation.

	Strategy as set out in OS2?	westoxon.gov.uk/consult.ti/Draft_Core_Strategy_January_2011/viewCompoundDoc?docid=659412 http://www.westoxon.gov.uk/residents/planning-building/planning-policy/local-development-framework/local-plan-2031-examination/
2. Assessing Flood Risk		
The level of assessment will depend on the degree of flood risk and the scale, nature and location of the proposed development. Refer to Table 6-1 *regarding the levels of assessment. Not all of the prompts listed below will be relevant for every application.*		
Flooding from Rivers	*Provide a plan of the site and Flood Zones.* *Identify any historic flooding that has affected the site, including dates and depths where possible.* *How is the site likely to be affected by climate change?* *Determine flood levels on the site for the 1% annual probability (1 in 100 chance each year) flood event including an allowance for climate change.* *Determine flood hazard on the site (in terms of flood depth and velocity).* *Undertake new hydraulic modelling to determine the flood level, depth, velocity, hazard, rate of onset of flooding on the site.*	*SFRA Appendix B* *Environment Agency Flood Map for Planning (Rivers and Sea).* *Environment Agency Products 1-7.* *New hydraulic model.*
Flooding from Land	*Identify any historic flooding that has affected the site.* *Review the local topography and conduce a site walkover to determine low points at risk of surface water flooding.* *Review the Risk of Flooding from Surface Water mapping.* *Where necessary, undertake modelling to assess surface water flood risk.*	*SFRA* *Topographic survey.* *Site walkover.* *Risk of Flooding from Surface Water mapping (EA website).* *New modelling study.*
Flooding from Groundwater	*Desk based assessment based on high level BGS mapping in the SFRA.* *Ground survey investigations.* *Identify any historic flooding that has affected the site.*	*SFRA Appendix B* *Ground Investigation Report*
Flooding from Sewers	*Identify any reported flood incidents that have affected the site.*	*Refer SFRA Section 4.4 & Appendix B* *Where appropriate an asset location survey can be provided by Thames Water Utilities Ltd http://www.thameswater-propertysearches.co.uk/*
Reservoirs, canals and other artificial sources	*Identify any historic flooding that has affected the site.* *Review the Risk of Flooding from Reservoirs mapping.*	*Risk of Flooding from Reservoirs mapping (EA website). Refer SFRA*
3. Proposed Development		
Current use	*Identify the current use of the site.*	-
Proposed use	*Will the proposals increase the number of occupants / site users on the site such that it may affect the degree of flood risk to these people?*	-
Vulnerability Classification	*Determine the vulnerability classification of the development. Is the vulnerability classification appropriate within the Flood Zone?*	*SFRA* Table 6-1 *SFRA* Table 6-2

4. Avoiding Flood Risk		
Sequential Test	*Determine whether the Sequential Test is required.* *Consult WODC to determine if the site has been included in the Sequential Test.* *If required, present the relevant information to WODC to enable their determination of the Sequential Test for the site on an individual basis.*	*SFRA Section 6.3*
Exception Test	*Determine whether the Exception Test is necessary.* *Where the Exception Test is necessary, present details of:* *Part 1) how the proposed development contributes to the achievement of wider sustainability objectives as set out in the WODC Sustainability Appraisal Scoping Report.* *(Details of how part 2) can be satisfied are addressed in the following part 5 'Managing and Mitigating Flood Risk'.)*	*SFRA* Table 6-2 *Refer to West Oxfordshire SA Scoping Report sustainability objectives. Appendix E*
5. Managing and Mitigating Flood Risk		
Section 9 of the SFRA presents measures to manage and mitigate flood risk and when they should be implemented. Where appropriate, the following should be demonstrated within the FRA to address the following questions: *How will the site/building be protected from flooding, including the potential impacts of climate change, over the development's lifetime?* *How will you ensure that the proposed development and the measures to protect your site from flooding will not increase flood risk elsewhere?* *Are there any opportunities offered by the development to reduce flood risk elsewhere?* *What flood-related risks will remain after you have implemented the measures to protect the site from flooding (i.e. residual risk) and how and by whom will these be managed over the lifetime of the development (e.g. flood warning and evacuation procedures)?*		
Development Layout and Sequential Approach	*Plan showing how sensitive land uses have been placed in areas within the site that are at least risk of flooding.*	*SFRA Section 9.2*
Finished Floor Levels	*Plans showing finished floor levels in the proposed development in relation to Ordnance Datum taking account of indicated flood depths.*	*SFRA Section 9.3*
Flood Resistance	*Details of flood resistance measures that have been incorporated into the design. Include design drawings where appropriate.*	*SFRA Section 9.5*
Flood Resilience	*Details of flood resilience measures that have been incorporated into the design. Include design drawings where appropriate.*	*SFRA Section 9.4*
Safe Access / Egress	*Provide a figure showing proposed safe route of escape away from the site and/or details of safe refuge. Include details of signage that will be included on site.* *Where necessary this will involve mapping of flood hazard associated with river flooding. This may be available from Environment Agency modelling, or may need to be prepared as part of hydraulic modelling specific for the proposed development site.*	*SFRA Section 9.6*
Floodplain Compensation Storage	*Provide calculations or results of a hydraulic modelling study to demonstrate that the proposed development provides compensatory flood storage and either will not increase flood risk to neighbouring areas or will result in an overall improvement. This should be located and designed to achieve level for level and volume for volume compensation, should be provided on land that is in hydrological continuity with the site*	*SFRA Section 9.7*

	within the applicant's ownership and subject to appropriate maintenance regimes for its lifetime. Include cross sectional drawings clearly showing existing and proposed site levels.	
Flow Routing	*Provide evidence that proposed development will not impact flood flows to the extent that the risk to surrounding areas is increased. Where necessary this may require modelling.*	*SFRA Section 9.8*
Riverside Development Buffer Zone	*Provide plans showing how a buffer zone of relevant width will be retained adjacent to any Main River or Ordinary Watercourse in accordance with requirements of the Environment Agency or Oxfordshire County Council.*	*SFRA Section 9.9*
Surface Water Management	*Completion of SuDS Proforma for all major development proposals in Flood Zones 1, 2 or 3.* *Details of the following within FRA for all other developments located within Flood Zones 2 and 3:* *Calculations (and plans) showing areas of the site that are permeable and impermeable pre and post-development.* *Calculations of pre and post-development runoff rates and volumes including consideration of climate change over the lifetime of the development.* *Details of the methods that will be used to manage surface water (e.g. permeable paving, swales, wetlands, rainwater harvesting).* *Where appropriate, reference the supporting Outline or Detailed Drainage Strategy for the site.* *Information on proposed management arrangements*	*Oxfordshrie County Council website - http://new.surreycc.gov.uk/people-and-community/emergency-planning-and-community-safety/flooding-advice/more-about-flooding/suds-planning-advice* *SFRA Section 9*
Flood Warning and Evacuation Plan	*Where appropriate reference the Flood Warning and Evacuation Plan or Personal Flood Plan that has been prepared for the proposed development (or will be prepared by site owners).*	*SFRA Section 9.11*

7.6 Pre-application Advice

At all stages, WODC, and where necessary the Environment Agency, Oxfordshire County Council and/or the Statutory Water Undertaker may need to be consulted to ensure the FRA provides the necessary information to fulfil the requirements for planning applications.

The EA, OCC and WODC each offer pre-application advice services which should be used to discuss particular requirements for specific applications.

- WODC - planning@westoxon.gov.uk
- OCC - https://www.oxfordshire.gov.uk/cms/content/contact-planning-and-regulation
- EA - http://webarchive.nationalarchives.gov.uk/20140328084622/http://www.environment-agency.gov.uk/research/planning/33580.aspx

The following government guidance sets out when LPAs should consult with the Environment Agency on planning applications https://www.gov.uk/flood-risk-assessment-local-planning-authorities. This has also been included in Table 9-1. Pre-application advice from the Environment Agency is chargeable.

8 Managing and Mitigating Flood Risk

8.1 Overview

The NPPF appreciates that it may not always be possible to avoid locating development in areas at risk of flooding. This Section provides an overview for developers on the range of measures that could be considered in order to manage and mitigate flood risk.

It is essential that the development managment process influencing the design of future development within the district carefully mitigates the potential impact that climate change may have upon the risk of flooding. As a result mitigation measures should be designed with an allowance for climate change over the lifetime of the proposed development as follows:

- 100 years (up to 2115) for residential developments; and
- 75 years (up to 2090) for commercial / industrial developments, or other time horizon specific to the non-residential use proposed.

8.2 Development Layout and Sequential Approach

A sequential approach to site planning should be applied with new development sites. The Sequential Test will be prepared by WODC as part of the Evidence Base for sites allocated in the Local Plan.

Flood risk should be considered at an early stage of development. By applying a sequential approach to development layout within the site, the most vulnerable elements of a development can be placed in the lowest risk area (considering all sources of flooding) e.g. residential elements should be restricted to areas at lower probability of flooding whereas parking, open space or proposed landscaped areas can be placed on lower ground with a higher probability of flooding.

8.3 Finished Floor Levels

All More Vulnerable and Highly Vulnerable development within Flood Zones 2 and 3 should set finished floor levels 300mm above the known or modelled 1 in 100 annual probability (1% AEP) flood level including an allowance for climate change.

Where developing in Flood Zone 2 and 3 is unavoidable, the recommended method of mitigating flood risk to people, particularly with More Vulnerable (residential) and Highly Vulnerable land uses, is to ensure internal floor levels are raised to provide a freeboard level above the design flood level (1 in 100 year + climate change).

In certain situations (e.g. for proposed extensions to buildings with a lower floor level or conversion of existing historical structures with limited existing ceiling levels), it could prove impractical to raise the internal ground floor levels to sufficiently meet the general requirements. In these cases, the Environment Agency and/or WODC should be approached to discuss options for a reduction in the minimum internal ground floor levels provided flood resistance measures to be implemented up to an agreed level.

Table 8.1provides an overview of the requirements for finished floor levels for development in West Oxfordshire. Reference should be made to 'Improving the flood performance of new buildings' CLG (2007).

Table 8-1 Finished Floor Levels

Development Type	Flood Zone 3	Flood Zone 2
Minor development (i.e. non-residential extensions with a floor space <250m^2 and householder developments)	Provide evidence to EA/OCCWODC that EITHER, Floor levels within the proposed development will be set no lower than existing levels AND, flood proofing of the proposed development has been incorporated where appropriate. Details of flood proofing / resilience and resistance techniques to be included in accordance with 'Improving the flood performance of new buildings' CLG (2007). OR, Floor levels within the extension will be set 300mm above the known or modelled 1 in 100 annual probability river flood (1%) in any year including climate change. Applicants should provide a plan showing floor levels relative to flood levels. All levels should be stated in relation to Ordnance Datum.	Provide evidence to EA/OCCWODC that, floor levels within the proposed development will be set no lower than existing levels AND, flood proofing of the proposed development has been incorporated where appropriate. Details of flood proofing / resilience and resistance techniques to be included in accordance with 'Improving the flood performance of new buildings' CLG (2007).
New residential development (More Vulnerable)	Where appropriate, subject to there being no other planning constraints (e.g. restrictions on building heights), finished floor levels should be set a minimum of 300mm above the 1% annual probability flood level (1 in 100 year) including climate change. The design flood level should be derived for the immediate vicinity of the site (i.e. relative to the extent of a site along a watercourse as flood levels are likely to vary with increasing distance downstream) as part of a site-specific FRA. Sleeping accommodation should be restricted to the first floor or above to offer the required 'safe places'. Internal ground floors below this level could however be occupied by either Less Vulnerable commercial premises, garages or non-sleeping residential rooms (e.g. kitchen, study, lounge) (i.e. applying a sequential approach within a building).	
New non-residential development (e.g. Less Vulnerable)	Finished floor levels may not need to be raised. For example, Less Vulnerable developments can be designed to be floodable instead of raising floor levels, and this may be beneficial to help minimise the impact of the development on the displacement of floodwater and the risk of flooding to the surrounding area. However, it is strongly recommended that internal access is provided to upper floors (first floor or a mezzanine level) to provide safe refuge in a flood event (refer to Section 8.5.1). Such refuges will have to be permanent and accessible to all occupants and users of the site and a Flood Warning and Evacuation Plan (FWEP) should be prepared to document the actions to take in the event of a flood.	

8.4 Flood Resilience & Flood Resistance

There is a range of flood resistance and resilience construction techniques that can be implemented in new developments to mitigate potential flood damage. The Department for Communities and Local Government (CLG) have published a document *'Improving the Flood Performance of New Buildings, Flood Resilient Construction'*[23], the aim of which is to provide guidance to developers and designers on how to improve the resistance and resilience of new properties to flooding through the use of suitable materials and construction details.

Figure 8-1 provides a summary of the Water Exclusion Strategy (flood resistance measures) and Water Entry Strategy (flood resilience measures) which can be adopted depending on the depth of floodwater that could be experienced.

23 CLG (2007) Improving the Flood Performance of New Buildings, Flood Resilient Construction

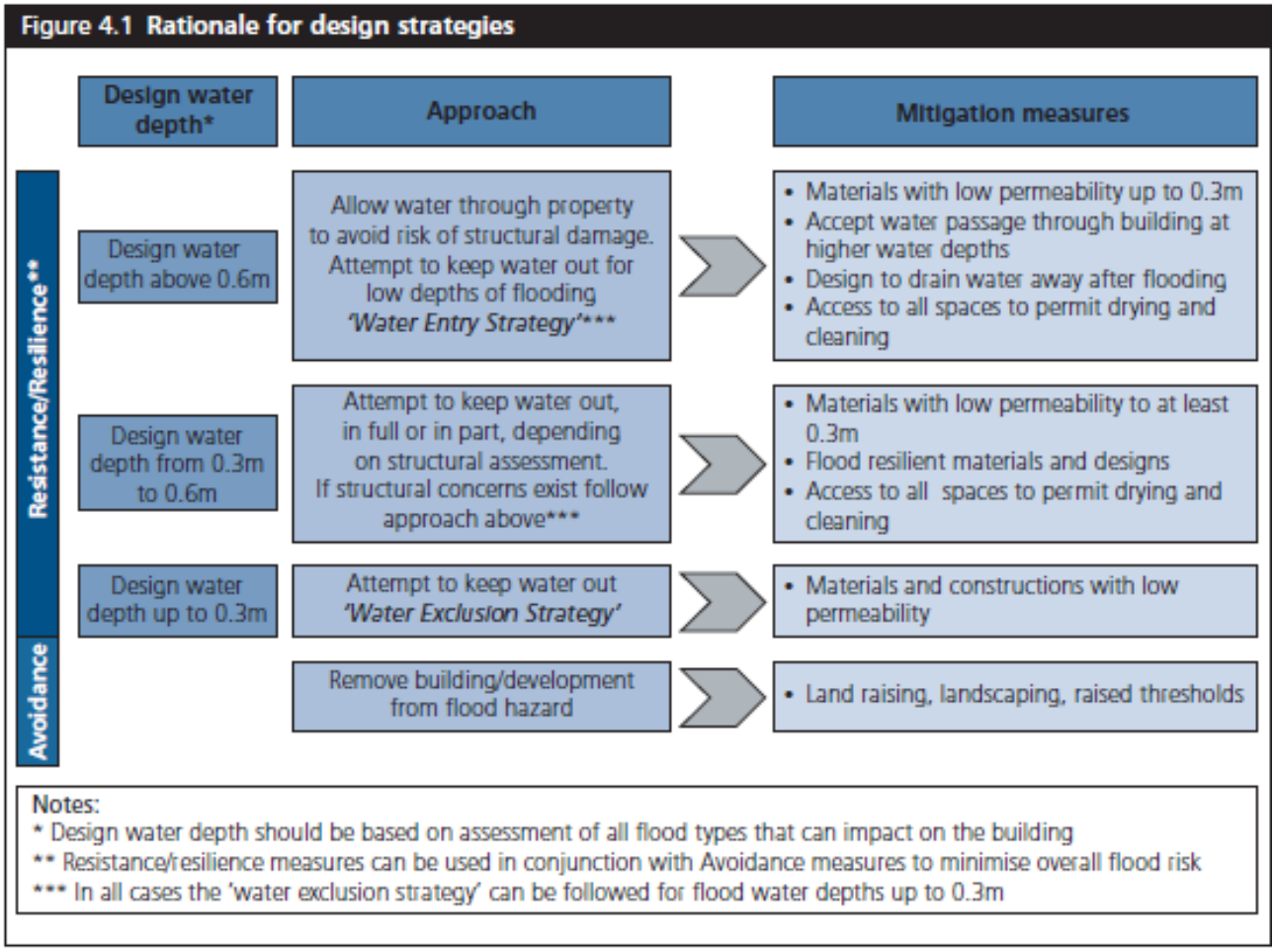


Figure 8-1 Flood Resistant / Resilient Design Strategies, Improving Flood Performance, CLG 2007

8.5 Safe Access and Egress

Safe access and egress is required to enable the evacuation of people from the development, provide the emergency services with access to the development during times of flood and enable flood defence authorities to carry out any necessary duties during periods of flood.

A safe access/egress route should allow occupants to safely enter and exit the buildings and be able to reach land outside the flooded area (e.g. within Flood Zone 1) using public rights of way without the intervention of emergency services or others during design flood conditions, including climate change allowances. This is of particular importance when contemplating development on sites located on dry islands (as described in Section 4.1.6).

Guidance prepared by the Environment Agency[24] uses a calculation of flood hazard to determine safety in relation to flood risk. Flood hazard is a function of the flood depth and flow velocity at a particular point in the floodplain along with a suitable debris factor to account for the hazard posed by any material entrained by the floodwater. The derivation of flood hazard is based on the methodology in Flood Risks to People FD2320, the use of which for the purpose of planning and development control is clarified in the abovementioned publication.

24 Environment Agency, HR Wallingford, May 2008, Supplementary note on Flood hazard ratings and thresholds for development planning and control purpose. Clarification of Table 13.1 FD2320/TR2 and Figure 3.2 FD2321/TR1. http://evidence.environment-agency.gov.uk/FCERM/Libraries/FCERM_Project_Documents/FD2321_7400_PR_pdf.sflb.ashx

Table 8-2 Hazard to People Rating *(HR=d x (v +0.5)+DF)* (Table 13.1 FD2320/TR2)

Flood Hazard (HR)	Description
Less than 0.75	**Very low hazard –** Caution
0.75 to 1.25	**Dangerous for some** – includes children, the elderly and the infirm
1.25 to 2.0	**Dangerous for most** – includes the general public
More than 2.0	**Dangerous for all** – includes the emergency services

For developments located in areas at risk of fluvial flooding safe access / egress must be provided for new development as follows in order of preference:

- Safe dry route for people and vehicles.
- Safe dry route for people.
- If a dry route for people is not possible, a route for people where the flood hazard (in terms of depth and velocity of flooding) is low and should not cause risk to people.
- If a dry route for vehicles is not possible, a route for vehicles where the flood hazard (in terms of depth and velocity of flooding) is low to permit access for emergency vehicles. However the public should not drive vehicles in floodwater.

In all these cases, a 'dry' access/egress is a route located above the 1% annual probability flood level (1 in 100 year) including an allowance for climate change.

8.5.1 Safe Refuge

In exceptional circumstances, dry access above the 1% annual probability (1 in 100 year) flood level including climate change may not be achievable. In these circumstances the local emergency planners and the emergency services where necessary should be consulted to ensure that the safety of the site occupants can be satisfactorily managed. This will be informed by the type of development, the number of occupants and their vulnerability and the flood hazard along the proposed egress route. For example, this may entail the designation of a safe place of refuge on an upper floor of a building, from which the occupants can be rescued by emergency services. It should be noted that sole reliance on a safe place of refuge is a last resort, and all other possible means to evacuate the site should be considered first. Provision of a safe place of refuge will not guarantee that an application will be granted.

8.6 Floodplain Compensation Storage

All new development within Flood Zone 3 must not result in a net loss of flood storage capacity. Where possible, opportunities should be sought to achieve an increase in the provision of floodplain storage.

Where proposed development results in an increase in building footprint, the developer must ensure that it does not impact upon the ability of the floodplain to store water, and should seek opportunities to provide betterment with respect to floodplain storage.

Similarly, where ground levels are elevated to raise the development out of the floodplain, compensatory floodplain storage within areas that currently lie outside the floodplain must be provided to ensure that the total volume of the floodplain storage is not reduced.

Floodplain compensation must be provided on a level for level or volume for volume basis on land which does not already flood and is within the site boundary. The applicant should state in their FRA if level for level compensation cannot be achieved. If neither level for level or volume for volume can be achieved, then the applicant may then wish to consider voids as a solution. If land proposed for flood voids is not within the site boundary, it must be in the immediate vicinity, in the applicant's ownership and linked to the site[25]. Floodplain compensation must be considered in the context of the 1% annual probability (1 in 100 year) flood level including an allowance for climate change.

25 In hydrological connectivity.

A FRA must demonstrate that there is no loss of flood storage capacity and include details of an appropriate maintenance regime to ensure mitigation continues to function for the life of the development. Guidance on how to address floodplain compensation is provided in Appendix A3 of the CIRIA Publication C624[26].

8.6.1 Car Parks

Where car parks are specified as areas for the temporary storage of surface water and fluvial floodwaters, flood depths should not exceed 300mm given that vehicles may be moved by water of greater depths. Where greater depths are expected, car parks should be designed to prevent the vehicles from floating out of the car park. Signs should be in place to notify drivers of the susceptibility of flooding and a flood alert provide some advance warning time that a car park could become inundated.

8.7 Flood Routing

All new development in Flood Zones 2 and 3 should not adversely affect flood routing and thereby increase flood risk elsewhere.

Opportunities should be sought within the site design to make space for water, such as:

- Removing boundary walls or replacing with other boundary treatments such as hedges, fences (with gaps).
- Considering alternatives to solid wooden gates, or ensuring that there is a gap beneath the gates to allow the passage of floodwater.
- On uneven or sloping sites, consider lowering ground levels to extend the floodplain without creating ponds.
- Create under-croft car parks or consider reducing ground floor footprint and creating an open area under the building to allow flood water storage.
- Where proposals entail floodable garages or outbuildings, consider designing a proportion of the external walls to be committed to free flow of floodwater.

In order to demonstrate that 'flood risk is not increased elsewhere', development in the floodplain will need to prove that flood routing is not adversely affected by the development, for example giving rise to backwater affects or diverting floodwaters onto other properties.

Potential overland flow paths should be determined and appropriate solutions proposed to minimise the impact of the development, for example by configuring road and building layouts to preserve existing flow paths and improve flood routing, whilst ensuring that flows are not diverted towards other properties elsewhere.

Careful consideration should be given to the use of fences and landscaping walls so as to prevent causing obstruction to flow routes and increasing the risk of flooding to the site or neighbouring areas.

8.8 Riverside Development

Retain an 8 metre wide undeveloped buffer strip alongside Main Rivers and explore opportunities for riverside restoration. New development within 8m of a Main River or Ordinary Watercourse will require permit from either the Environment Agency or Oxfordshire County Council (as LLFA) respectively.

The EA is likely to seek an 8 metre wide undeveloped buffer strip alongside main fluvial rivers for maintenance purposes, and would also ask developers to explore opportunities for riverside restoration as part of any development.

Under the Environmental Permit Regulations 2016, any works within 8 metres of any statutory Main River (both open channels and culverted sections) requires an Environment Agency permit.

To clarify, "any works" includes permanent or temporary. It may be wise for applicants to consult the following website to view the new regulations and types of permits that have replaced consents https://www.gov.uk/guidance/flood-risk-activities-environmental-permits

OCC is now responsible[27] for the consenting of works to ordinary watercourses and has powers to enforce un-consented and non-compliant works. This includes any works (including temporary) within 8 metres that affect flow within the channel (such as in channel structures or diversion of watercourses).

26 CIRIA January 2004, CIRIA Report 624: Development and Flood Risk - Guidance for the Construction Industry

27 6th April 2012, under Section 23 of the Land Drainage Act 1991 (as amended by the Flood and Water Management Act 2010)

It has been agreed under an agency agreement that the city and district councils within the OCC area will undertake consenting works of ordinary watercourses on behalf of OCC. Enquiries for ordinary watercourse consent should be sent to enquiries@westoxon.gov.uk and applications for ordinary watercourse consent should be sent to Environment and Commercial Services, West Oxfordshire District Council, Woodgreen, New Yatt Road, Witney, OX28 1NB.

8.9 Surface Water Management

Development should not result in an increase in surface water runoff, and where possible, should demonstrate betterment in terms of rate and volumes of surface water.

Sustainable Drainage Systems (SuDS) should be used to reduce and manage surface water run-off to and from proposed developments as near to source as possible in accordance with the requirements of West Oxfordshire Local Plan Policy EH5 and supporting guidance published by DCLG and Department for the Environment, Food and Rural Affairs (DEFRA)[1].

Suitable surface water management measures should be incorporated into new development designs in order to reduce and manage surface water flood risk to, and posed by the proposed development. This should ideally be achieved by incorporating (SuDS).

SuDS are typically softer engineering solutions inspired by natural drainage processes such as ponds and swales which manage water as close to its source as possible. Wherever possible, a SuDS technique should seek to contribute to each of the three goals identified below. Where possible SuDS solutions for a site should seek to:

1. Reduce flood risk (to the site and neighbouring areas),
2. Reduce pollution, and
3. Provide landscape and wildlife benefits.

Generally the aim should be to discharge surface water run-off as high up the following hierarchy of drainage options as reasonably practicable:

1. Into the ground (infiltration)
2. To a surface water body
3. To a surface water sewer, highway drain, or another drainage system
4. To a combined sewer when all other options have been exhausted

SuDS techniques can be used to reduce the rate and volume and improve the water quality of surface water discharges from sites to the receiving environment (i.e. natural watercourse or public sewer etc.). The SuDS Manual[28] identified several processes that can be used to manage and control runoff from developed areas. Each option can provide opportunities for storm water control, flood risk management, water conservation and groundwater recharge.

- **Infiltration**: the soaking of water into the ground. This is the most desirable solution as it mimics the natural hydrological process. The rate of infiltration will vary with soil type and condition, the antecedent conditions and with time. The process can be used to recharge groundwater sources and feed baseflows of local watercourses, but where groundwater sources are vulnerable or there is risk of contamination, infiltration techniques are not suitable.
- **Detention/Attenuation**: the slowing down of surface flows before their transfer downstream, usually achieved by creating a storage volume and a constrained outlet. In general, though the storage will enable a reduction in the peak rate of runoff, the total volume will remain the same, just occurring over a longer duration.
- **Conveyance:** the transfer of surface runoff from one place to another, e.g. through open channels, pipes and trenches.
- **Water Harvesting:** the direct capture and use of runoff on site, e.g. for domestic use (flushing toilets) or irrigation of urban landscapes. The ability of these systems to perform a flood risk management function will be dependent on their scale, and whether there will be a suitable amount of storage always available in the event of a flood.

As part of any SuDS scheme, consideration should be given to the long-term maintenance of the SuDS to ensure that it remains functional for the lifetime of the development. Table 9.1 has been reproduced from the SuDS Manual, CIRIA C697 and outlines typical SuDS techniques.

25 Major development – 10 or more dwellings and 1000 sqm floorspace

28 CIRIA C697 SuDS Manual. http://www.ciria.org/Resources/Free_publications/the_suds_manual.aspx

The application of SuDS is not limited to a single technique per site. Often a successful SuDS solution will utilise a combination of techniques, providing flood risk, pollution and landscape/wildlife benefits. In addition, SuDS can be employed on a strategic scale, for example with a number of sites contributing to large scale jointly funded and managed SuDS. It should be noted, each development site must offset its own increase in runoff and attenuation cannot be "traded" between developments.

Table 9.1 Typical SuDS Components

Technique	Description	Conveyance	Detention	Infiltration	Harvesting
Pervious Surfaces	Pervious surfaces allow rainwater to infiltrate through the surface into an underlying storage layer, where water is stored before infiltration to the ground, reuse, or release to surface water.		Y	Y	*
Filter Drains	Linear drains/trenches filled with a permeable material, often with perforated pipe in the base of the trench. Surface water from the edge of paved areas flows into the trenches, is filtered and conveyed to other parts of the site.	Y	Y		
Filter Strips	Vegetated strips of gently sloping ground designed to drain water evenly from impermeable areas and filter out silt and particulates.	*	*	*	
Swales	Shallow vegetated channels that conduct and/or retain water, and can permit infiltration when unlined.	Y	Y	*	
Ponds	Depressions used for storing and treating water.		Y	*	Y
Wetlands	As ponds, but the runoff flows slowly but continuously through aquatic vegetation that attenuates and filters the flow. Shallower than ponds. Based on geology these measures can also incorporate some degree of infiltration.	*	Y	*	Y
Detention Basin	Dry depressions designed to store water for a specified retention time.		Y		
Soakaways	Sub-surface structures that store and dispose of water via infiltration.			Y	
Infiltration Trenches	As filter drains, but allowing infiltration through trench base and sides.	*	Y	Y	
Infiltration Basins	Depressions that store and dispose of water via infiltration.		Y	Y	
Green Roofs	Green roofs are systems which cover a building's roof with vegetation. They are laid over a drainage layer, with other layers providing protection, waterproofing and insulation. It is noted that the use of brown/green roofs should be for betterment purposes and not to be counted towards the provision of on-site storage for surface water. This is because the hydraulic performance during extreme events is similar to a standard roof (CIRIA C697).		Y		
Rainwater Harvesting	Storage and use of rainwater for non-potable uses within a building, e.g. toilet flushing. It is noted that storage in these types of systems is not usually considered to count towards the provision of on-site storage for surface water balancing because, given the sporadic nature of the use of harvested water, it cannot be guaranteed that the tanks are available to provide sufficient attenuation for the storm event.	*	*	*	Y

(Y; primary process, * some opportunities, subject to design)

From 6 April 2015, all major development[29] should include provision for SuDS. The Lead Local Flood Authority is a statutory consultee for these schemes. Applicants are strongly encouraged to discuss their proposals with Oxfordshire County Council at the pre-application stage. A request can be made via Drainage@oxfordshire.gov.uk. The

29 Major development as defined in the Town and County Planning (Development Management Procedure) (England) Order 2010

Lead Local Flood Authorities of South East England have also produced a useful document outlining the process for integrating SuDS into developments[30].

8.10 Flood Warning and Evacuation Plans

For all developments (excluding minor developments and change of use) proposed in Flood Zone 2 or 3, a Flood Warning and Evacuation Plan should be prepared to demonstrate what actions site users will take before, during and after a flood event to ensure their safety, and to demonstrate their development will not impact on the ability of the local authority and the emergency services to safeguard the current population.

For sites in Flood Zone 1 that are located on 'dry islands' (as described in Section 4.1.6), it may also be necessary to prepare a Flood Warning and Evacuation Plan to determine potential egress routes away from the site through areas that may be at risk of flooding during the 1% annual probability (1 in 100 year) flood event including an allowance for climate change.

Evacuation is where flood alerts and warnings provided by the Environment Agency enable timely actions by residents or occupants to allow evacuation to take place unaided, i.e. without the deployment of trained personnel to help people from their homes, businesses and other premises. Rescue by the emergency services is likely to be required where flooding has occurred and prior evacuation has not been possible.

There are 9 flood warning areas within the district, as shown in Appendix B and Table 9. 2 below. The Environment Agency issues flood warnings to residents and businesses that have registered for the service in these specific areas when flooding is expected.

Table 9.2 Environment Agency Flood Warning Areas (refer to Appendix B Figure 8)

Watercourse	Environment Agency Flood Warning Area (Name)
River Thames	Buscot Wick down to Shifford
Evenlode	Milton under Wychwood, Shipton under Wychwood and Ascott under Wychwood
	Eynsham Mill down to and including Cassington Mill near Cassin
Windrush	Asthall, Minster Lovell and Crawley
	Rack End and Standlake including Northmoor and Newbridge
	Witney and Ducklington
Clanfield Brook	Clanfield Village
Glyme	Woodstock
Leach	Below Southrop to Mill Lane near Lechlade

Flood Warning and Evacuation Plans should include:

How flood warning is to be provided, such as:

- availability of existing flood warning systems (refer to Table 9.2);
- where available, rate of onset of flooding and available flood warning time; and
- how flood warning is given.

30 Water, People, Places: A guide for master planning sustainable drainage into development – http://www.susdrain.org/files/resources/other-guidance/water_people_places_guidance_for_master_planning_sustainable_drainage_into_developments.pdf

What will be done to protect the development and contents, such as:

- How easily damaged items (including parked cars) or valuable items (important documents) will be relocated;
- How services can be switched off (gas, electricity, water supplies);
- The use of flood protection products (e.g. flood boards, airbrick covers);
- The availability of staff/occupants/users to respond to a flood warning, including preparing for evacuation, deploying flood barriers across doors etc.; and
- The time taken to respond to a flood warning.

Ensuring safe occupancy and access to and from the development, such as:

- Occupant awareness of the likely frequency and duration of flood events, and the potential need to evacuate;
- Safe access route to and from the development;
- If necessary, the ability to maintain key services during an event;
- Vulnerability of occupants, and whether rescue by emergency services will be necessary and feasible; and
- Expected time taken to re-establish normal use following a flood event (clean-up times, time to re-establish services etc.)

There is no statutory requirement for the Environment Agency or the emergency services to approve evacuation plans. WODC is accountable via planning condition or agreement to ensure that plans are suitable. This should be done in consultation with emergency planning staff.

Flood Planning can be found on gov.uk, available at: https://www.gov.uk/government/publications/personal-flood-plan

9 Flood Risk Policy and Development Management Approach

9.1 Overview

In order to encourage a holistic approach to flood risk management and ensure that flooding is taken into account at all stages of the planning process, this Section builds on the findings of the SFRA to set out the approach that WODC are adopting in relation to flood risk planning policy and with respect to development management decisions on a day-to-day basis.

Section 9.2 sets out the overarching policy approach for planning decisions within each of the NPPF Flood Zones and with respect to a number of specific types of planning application. Section 9.3 presents a guide to the measures that should be considered for different types of proposed development within each of the NPPF Flood Zones.

9.2 National Policy Approach

The overall approach for development in each NPPF Flood Zone is set out below:

9.2.1 Flood Zone 3b Functional Floodplain

The Functional Floodplain as defined in this SFRA by WODC comprises land within the 5% annual probability (1 in 20 year) flood outline. These areas should be safeguarded from any further development. The only development permitted is essential infrastructure (subject to the exception test being passed) and water compatible.

If Water Compatible or Essential Infrastructure cannot be located elsewhere, it must:

- Remain operational and safe for users in times of flood;
- Result in no net loss of flood storage;
- Not impede water flows; and
- Not increase flood risk elsewhere.

Where redevelopment is proposed in developed areas, schemes should not increase the vulnerability classification of the site. All schemes must result in a net reduction in flood risk and ensure that floodplain storage and flow routes are not affected.

Proposals for the change of use or conversion to a use with a higher vulnerability classification will not be permitted. Basements, basements extensions, conversions of basements to a high vulnerability classification or self-contained units will not be permitted.

9.2.2 Flood Zone 3a High Probability

Flood Zone 3a High Probability comprises land having a 1% (1 in 100 year) annual probability or greater. Where development is proposed opportunities should be sought to:

- Relocate existing development to land in zones with a lower probability of flooding;
- 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;
- Remain safe for users in times of flood; and
- Create space for flooding to occur by restoring natural floodplain and flood flow paths and by identifying, allocating and safeguarding open space for flood storage.

9.2.3 Flood Zone 2 Medium Probability

Flood Zone 2 Medium Probability comprises land having between a 1% (1 in 100 year) and 0.1% (1 in 1000) annual probability of flooding from fluvial watercourses. Where development is proposed in areas of Flood Zone 2, the planning policy approach is similar to Flood Zone 3a. Opportunities should be sought to:

- Relocate existing development to land in zones with a lower probability of flooding;

- 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;
- Remain safe for users in times of flood; and
- Create space for flooding to occur by restoring natural floodplain and flood flow paths and by identifying, allocating and safeguarding open space for flood storage.

9.2.4 Flood Zone 1 Low Probability

Flood Zone 1 Low Probability comprises land having a less than 0.1% (1 in 1000 year) annual probability of flooding from fluvial watercourses. Where development over 1ha is proposed or there is evidence of flooding from another localised source in areas of Flood Zone 1, opportunities should be sought to:

- Ensure that the management of surface water runoff from the site is considered early in the site planning and design process;
- Ensure safe access and egress and create space for flooding to occur;
- Ensure that proposals achieve an overall reduction in the level of flood risk to the surrounding area, through the appropriate application of sustainable drainage techniques.

9.2.5 Cumulative Impact of Minor and Permitted Development

The PPG advises that minor developments are unlikely to result in significant flood risk issues unless:

- They would have an adverse effect on a watercourse, floodplain or its flood defences;
- They would impede access to flood defence and management facilities; or
- Where the cumulative impact of such developments would have a significant impact on local flood storage capacity or flood flows.

In parts of West Oxfordshire there is potential for both minor development as well as permitted development to be considered to be having a cumulative impact on flood risk in the local area as a result of impacts on local flood storage capacity and flood flows. Given the small scale of the development in the context of the wider fluvial catchments it is not possible to undertake modelling to confirm the impact of such development. This is a particular concern in the areas of Witney where areas of existing development lie within the 5% annual probability (1 in 20 year) flood outline.

It is recommended that WODC consider making an Article 4 direction[32] to remove national permitted development rights for developed areas of land within Flood Zone 3b where cumulative impact is considered to be a problem e.g. the River Windrush floodplain in the Witney Settlement Area. The removal of permitted development rights will ensure that a planning application and site-specific FRA will be required for *any* development in these areas.

9.2.6 Changes of Use

Where a development undergoes a change of use and the vulnerability classification of the development changes, there may be an increase in flood risk. For example, changing from industrial use to residential use will increase the vulnerability classification from Less to More Vulnerable (Table 6-1).

For change of use applications in Flood Zone 2 and 3, applicants must submit a FRA with their application. This should demonstrate how the flood risks to the development will be managed so that it remains safe through its lifetime including provision of safe access and egress and preparation of Flood Warning and Evacuation Plans where necessary.

As changes of use are not subject to the Sequential or Exception tests, WODC should consider when formulating policy what changes of use will be acceptable, having regard to paragraph 157 (6th bullet) of the NPPF and taking into account the findings of this SFRA. This is likely to depend on whether developments can be designed to be safe and that there is safe access and egress.

9.3 Development Management Measures

Table 9-1sets out the measures that should be considered for different types of propose development within each NPPF Flood Zone. Before consulting Table 9-1, refer to Table 6-1 to determine the vulnerability classification of the proposed development.

32 An article 4 direction is a direction under article 4 of the General Permitted Development Order which enables the Secretary of State or the local planning authority to withdraw specified permitted development rights across a defined area.

Table 9-1 Development Management Measures Summary Table

	All Development	Minor development				Other development				SFRA section
	Flood Zone 3b (Undeveloped –Functional Floodplain)	Flood Zone 3b (Developed)	Flood Zone 3a	Flood Zone 2	Flood Zone 1	Flood Zone 3b (Developed)	Flood Zone 3a	Flood Zone 2	Flood Zone 1	
Proposed Development Types	Flood Zone 3b (Undeveloped Functional Floodplain) should be protected from any new development. Only Essential Infrastructure or Water Compatible development may be permitted.	'Developed land' within Flood Zone 3b relates solely to existing buildings that are impermeable to flood water. Some minor development proposals may be considered. Change of use to a higher vulnerability classification is not permitted.	Land use should be restricted to Water Compatible or Less Vulnerable development. More Vulnerable development can be considered. Highly Vulnerable development is not appropriate.	Land use should be restricted to Water Compatible, Less Vulnerable or More Vulnerable development. Highly Vulnerable development can be considered.	No restrictions.	'Developed land' within Flood Zone 3b relates solely to existing buildings that are impermeable to flood water. Some re-development proposals may be considered. Change of use to a higher vulnerability classification is not permitted.	Land use should be restricted to Water Compatible or Less Vulnerable development. More Vulnerable development can be considered.	Land use should be restricted to Water Compatible, Less Vulnerable or Mole Vulnerable development. Highly Vulnerable development can be considered.	No restrictions.	Section 6.2 Table 6-2.
Basements	Not permitted.	Basements, basement extensions, conversions of basements to a higher vulnerability classification or self-contained units are not permitted.	Self-contained residential basements and bedrooms at basement level are not permitted. All basements, basement extensions and basement conversions may be considered. Regard will be had to whether the site is also affected by groundwater flooding.		No restrictions.	Basements, basement extensions, conversions of basements to a higher vulnerability classification or self-contained units are not permitted.	Self-contained residential basements and bedrooms at basement level are not permitted. All basements, basement extensions and basement conversions may be considered. Regard will be had to whether the site is also affected by groundwater flooding.		No restrictions.	Section 9.2
Flood Risk Assessment	Yes – for Essential Infrastructure	Yes – key outcomes must be: • How the development is likely to be affected by current or future flooding from any source • What measures are proposed to deal with these effects and risks are appropriate • Development does not increase the risk of flooding elsewhere by not impeding the flow of water or reducing storage capacity. It is acknowledged that full compensation may not be possible in all cases, but justification must be given. • Whether the development is safe for its lifetime			Required if site > 1 hectare, or there is evidence of a localised flood source.	Yes – key outcomes must be • How the development is likely to be affected by current or future flooding from any source • What measures are proposed to deal with these effects and risks are appropriate • Development results in an improvement to flood risk by not impeding the flow of water, reducing storage capacity or increasing the number of properties at risk of flooding • Evidence to support the application of the Sequential Test, where appropriate • Whether the development is safe for its lifetime and passes the Exception Test, if applicable			Required if site > 1 hectare, or there is evidence of a localised flood source.	Section 7.2
Sequential Test	Not required.	Not required	Not required	Not required	N/A	Yes – if not addressed at the Local Plan level and development type is not included in the list of exemptions			N/A	Section 6.2
Exception Test	Yes – required for Essential Infrastructure.	Not required	Not required	Not required	N/A	Yes – required for More Vulnerable development and Essential Infrastructure		Yes – required for Highly Vulnerable development	N/A	Section 4.3
Sequential approach to site planning	N/A	Yes	Yes	Yes	Yes – with respect to flooding from other sources.	Yes	Yes	Yes	Yes – with respect to flooding from other sources.	Section 5.2
Finished Floor Levels	N/A	For More Vulnerable development, floor levels should be set 300mm above modelled 1 in 100 year flood level including an allowance for climate change. Floor levels may not need to be raised for new non-residential (Less Vulnerable) development as such development can be designed to be floodable. However, it is strongly recommended that internal access is provided to upper floors (first floor or mezzanine) to provide safe refuge. Sleeping accommodation should be restricted to first floor or above to ensure 'safe place'. Apply sequential approach within the building.			No minimum level specified. Floor levels should take account of any localised flood risk from surface water ponding.	For More Vulnerable development, floor levels should be set 300mm above modelled 1 in 100 year flood level including an allowance for climate change. Floor levels may not need to be raised for new non-residential (Less Vulnerable) development as such development can be designed to be floodable. However, it is strongly recommended that internal access is provided to upper floors (first floor or mezzanine) to provide safe refuge. Sleeping accommodation should be restricted to first floor or above to ensure 'safe place'. Apply sequential approach within the building.			No minimum level specified. Floor levels should take account of any localised flood risk from surface water ponding.	Section 8.3

	All Development	Minor development				Other development				SFRA section
	Flood Zone 3b (Undeveloped – Functional Floodplain)	Flood Zone 3b (Developed)	Flood Zone 3a	Flood Zone 2	Flood Zone 1	Flood Zone 3b (Developed)	Flood Zone 3a	Flood Zone 2	Flood Zone 1	
Proposed Development Types	Flood Zone 3b (Undeveloped Functional Floodplain) should be protected from any new development. Only Essential Infrastructure or Water Compatible development may be permitted.	'Developed land' within Flood Zone 3b relates solely to existing buildings that are impermeable to flood water. Some minor development proposals may be considered. Change of use to a higher vulnerability classification is not permitted.	Land use should be restricted to Water Compatible or Less Vulnerable development. More Vulnerable development can be considered. Highly Vulnerable development is not appropriate.	Land use should be restricted to Water Compatible, Less Vulnerable or More Vulnerable development. Highly Vulnerable development can be considered.	No restrictions.	'Developed land' within Flood Zone 3b relates solely to existing buildings that are impermeable to flood water. Some re-development proposals may be considered. Change of use to a higher vulnerability classification is not permitted.	Land use should be restricted to Water Compatible or Less Vulnerable development. More Vulnerable development can be considered.	Land use should be restricted to Water Compatible, Less Vulnerable or Mole Vulnerable development. Highly Vulnerable development can be considered.	No restrictions.	Section 6.2 Table 6-2.
Basements	Not permitted.	Basements, basement extensions, conversions of basements to a higher vulnerability classification or self-contained units are not permitted.	Self-contained residential basements and bedrooms at basement level are not permitted. All basements, basement extensions and basement conversions may be considered. Regard will be had to whether the site is also affected by groundwater flooding.		No restrictions.	Basements, basement extensions, conversions of basements to a higher vulnerability classification or self-contained units are not permitted.	Self-contained residential basements and bedrooms at basement level are not permitted. All basements, basement extensions and basement conversions may be considered. Regard will be had to whether the site is also affected by groundwater flooding.		No restrictions.	Section 9.2
Flood Risk Assessment	Yes – for Essential Infrastructure	Yes – key outcomes must be: • How the development is likely to be affected by current or future flooding from any source • What measures are proposed to deal with these effects and risks are appropriate • Development does not increase the risk of flooding elsewhere by not impeding the flow of water or reducing storage capacity. It is acknowledged that full compensation may not be possible in all cases, but justification must be given. • Whether the development is safe for its lifetime			Required if site > 1 hectare, or there is evidence of a localised flood source.	Yes – key outcomes must be • How the development is likely to be affected by current or future flooding from any source • What measures are proposed to deal with these effects and risks are appropriate • Development results in an improvement to flood risk by not impeding the flow of water, reducing storage capacity or increasing the number of properties at risk of flooding • Evidence to support the application of the Sequential Test, where appropriate • Whether the development is safe for its lifetime and passes the Exception Test, if applicable			Required if site > 1 hectare, or there is evidence of a localised flood source.	Section 7.2
Sequential Test	Not required.	Not required	Not required	Not required	N/A	Yes – if not addressed at the Local Plan level and development type is not included in the list of exemptions			N/A	Section 6.2
Exception Test	Yes – required for Essential Infrastructure.	Not required	Not required	Not required	N/A	Yes – required for More Vulnerable development and Essential Infrastructure		Yes – required for Highly Vulnerable development	N/A	Section 4.3
Sequential approach to site planning	N/A	Yes	Yes	Yes	Yes – with respect to flooding from other sources.	Yes	Yes	Yes	Yes – with respect to flooding from other sources.	Section 5.2
Finished Floor Levels	N/A	For More Vulnerable development, floor levels should be set 300mm above modelled 1 in 100 year flood level including an allowance for climate change. Floor levels may not need to be raised for new non-residential (Less Vulnerable) development as such development can be designed to be floodable. However, it is strongly recommended that internal access is provided to upper floors (first floor or mezzanine) to provide safe refuge. Sleeping accommodation should be restricted to first floor or above to ensure 'safe place'. Apply sequential approach within the building.			No minimum level specified. Floor levels should take account of any localised flood risk from surface water ponding.	For More Vulnerable development, floor levels should be set 300mm above modelled 1 in 100 year flood level including an allowance for climate change. Floor levels may not need to be raised for new non-residential (Less Vulnerable) development as such development can be designed to be floodable. However, it is strongly recommended that internal access is provided to upper floors (first floor or mezzanine) to provide safe refuge. Sleeping accommodation should be restricted to first floor or above to ensure 'safe place'. Apply sequential approach within the building.			No minimum level specified. Floor levels should take account of any localised flood risk from surface water ponding.	Section 8.3

	All Development	Minor development				Other development				SFRA section
	Flood Zone 3b (Undeveloped – Functional Floodplain)	Flood Zone 3b (Developed)	Flood Zone 3a	Flood Zone 2	Flood Zone 1	Flood Zone 3b (Developed)	Flood Zone 3a	Flood Zone 2	Flood Zone 1	
		Where permitted, basements will require internal access to a floor 300m above 1% (1 in 100 year) annual probability flood event including an allowance for climate change.				Where permitted, basements will require internal access to a floor 300m above 1% (1 in 100 year) annual probability flood event including an allowance for climate change.				
Flood Resistance	N/A	Yes – typically applied in areas of flood depths <0.3m and between 0.3m and 0.6m where no structure concerns	Yes – typically applied in areas of flood depths <0.3m and between 0.3m and 0.6m where no structure concerns	Yes – typically applied in areas of flood depths <0.3m and between 0.3m and 0.6m where no structure concerns	Yes – with respect to surface water flood risk.	Yes - typically applied in areas of flood depths <0.3m and between 0.3m and 0.6m where no structure concerns	Yes - typically applied in areas of flood depths <0.3m and between 0.3m and 0.6m where no structure concerns	Yes - typically applied in areas of flood depths <0.3m and between 0.3m and 0.6m where no structure concerns	Yes – with respect to surface water flood risk.	Section 8.4
Flood Resilience	N/A	Yes – typically applied in areas of flood depths >0.6m.	Yes - typically applied in areas of flood depths >0.6m.	Yes - typically applied in areas of flood depths >0.6m.	Yes – with respect to surface water flood risk.	Yes - typically applied in areas of flood depths >0.6m.	Yes - typically applied in areas of flood depths >0.6m.	Yes - typically applied in areas of flood depths >0.6m.	Yes – with respect to surface water flood risk.	Section 8.4
Safe access/ egress	N/A	In order of preference: • Safe, dry route for people and vehicles • Safe, dry route for people • If a dry route for people is not possible, a route for people where the flood hazard is low • If a dry route is not possible, a route for vehicles where the flood hazard is low • Safe refuge for people • 'Dry' access/egress is a route located above the 1% (1 in 100 year) annual probability flood event including an allowance for climate change.			Safe means of escape must be provided in relation to risk of flooding from other sources.	In order of preference: • Safe, dry route for people and vehicles • Safe, dry route for people • If a dry route for people is not possible, a route for people where the flood hazard is low • If a dry route is not possible, a route for vehicles where the flood hazard is low • Safe refuge for people • 'Dry' access/egress is a route located above the 1% (1 in 100 year) annual probability flood event including an allowance for climate change.			Safe means of escape must be provided in relation to risk of flooding from other sources.	Section 8.5
Floodplain compensation storage	N/A	Yes - Development must not result in a net loss of flood storage capacity in relation to the 1% annual probability) flood event including allowance for climate change. Where possible, opportunities should be sought to achieve an increase in the provision of floodplain storage. It is recognised that full compensation storage may not always be viable for minor development. In these cases justification must be provided and measures taken to mitigate loss of floodplain storage i.e. through measures to allow the passage of floodwater or provide storage (refer to 'flood voids', and 'flow routing' below).	Not required.		Yes - Development must not result in a net loss of flood storage capacity in relation to the 1% annual probability) flood event including allowance for climate change. Where possible, opportunities should be sought to achieve an increase in the provision of floodplain storage. Where possible floodplain compensation should be provided on a level for level, volume for volume basis. It is recognised that full compensation storage will not be viable for sites wholly within Flood Zone 3. In these cases justification must be provided and measures taken to mitigate loss of floodplain storage i.e. through measures to allow the passage of floodwater or provide storage (refer to 'flood voids', and 'flow routing' below).	Not required.		Section 8.6
Flood voids	N/A	Yes – where it is not possible to provide floodplain compensation storage or full compensation cannot be achieved, flood voids can be used to provide mitigation. Flood voids should be appropriately designed and kept clear to enable them to function effectively.	Not required.		Yes – where it is not possible to provide floodplain compensation storage or full compensation cannot be achieved, flood voids can be used to provide mitigation. Void openings should be a minimum of 1m long and open from existing ground levels to at least the 1 in 100 year plus climate change level. Minimum of 1m void length per 5m wall. Require maintenance plan and apply condition to ensure voids remain open for the lifetime of the development.	Not required.		Section 8.6
Flow routing	N/A	Yes - Minor development and new development should not adversely affect flood routing and thereby increase flood risk elsewhere. Opportunities should be sought within the site design to make space for water, such as: • Removing boundary walls or replacing with other boundary treatments such as hedges, fences (with gaps). • Considering alternatives to solid wooden gates, or ensuring that there is a gap beneath the gates to allow the passage of floodwater. • On uneven or sloping sites, consider lowering ground levels to extend the floodplain without creating ponds. The area of lowered ground must remain connected to the floodplain to allow water to flow								Section 8.7

<table>
<tr><th></th><th>All Development</th><th colspan="4">Minor development</th><th colspan="4">Other development</th><th>SFRA section</th></tr>
<tr><th></th><th>Flood Zone 3b (Undeveloped – Functional Floodplain)</th><th>Flood Zone 3b (Developed)</th><th>Flood Zone 3a</th><th>Flood Zone 2</th><th>Flood Zone 1</th><th>Flood Zone 3b (Developed)</th><th>Flood Zone 3a</th><th>Flood Zone 2</th><th>Flood Zone 1</th><th></th></tr>
<tr><td></td><td></td><td colspan="8">back to river when levels recede.
• Create under-croft car parks or consider reducing ground floor footprint and creating an open area under the building to allow flood water storage.
• Where proposals entail floodable garages or outbuildings, consider designing a proportion of the external walls to be committed to free flow of floodwater.</td><td></td></tr>
<tr><td>Riverside development</td><td></td><td colspan="8">Yes – Retain an 8m wide buffer strip alongside Main Rivers and seek opportunities for riverside restoration. Retain a 5m wide buffer strip alongside Ordinary Watercourses. All new development within 8m of a Main River or Ordinary Watercourse will require consent from the Environment Agency or Oxfordshire County Council (as LLFA) respectively.</td><td>Section 8.8</td></tr>
<tr><td>Surface water management</td><td>N/A</td><td colspan="8">Proposed development should not result in an increase in surface water runoff, and where possible, should demonstrate betterment in terms of rate and volumes of surface water runoff. Proposed development should implement Sustainable Drainage Systems (SuDS) in accordance with the requirements of the 'Non-statutory technical standards for sustainable drainage systems'[33], to reduce and manage surface water runoff to and from proposed developments.

Requirements within the non-statutory technical standards for Greenfield and previously developed sites are as follows:
<table>
<tr><th></th><th>Previously developed site</th><th>Greenfield site</th></tr>
<tr><td>Peak Flow Control Volume</td><td>the peak runoff rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event must be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment for that event.</td><td>The peak runoff rate from the development to any highway drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event should never exceed the peak greenfield runoff rate for the same event.</td></tr>
<tr><td>Volume Control</td><td>Where reasonably practicable, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event, but should never exceed the runoff volume from the development site prior to redevelopment for that event.
Where this is not reasonably practicable, the runoff volume must be discharged at a rate that does not adversely affect flood risk.</td><td>Where reasonably practicable, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event should never exceed the greenfield runoff volume for the same event.
Where this is not reasonably practicable, the runoff volume must be discharged at a rate that does not adversely affect flood risk.</td></tr>
</table></td><td>Section 8.9</td></tr>
<tr><td>Flood Warning and Evacuation Plan</td><td>N/A</td><td colspan="2">Yes - the flood plan tool can be found on the gov.uk website[34]. The Plan comprises a checklist of things to do before, during and after a flood and a place to record important contact details. For minor development, it is recommended that the use of this tool to create a Personal Flood Plan will be appropriate.</td><td>Yes - In areas of known surface water flood risk, it may be appropriate to prepare a Personal Flood Plan using the website available on gov.uk[34]</td><td colspan="2">Yes – Promote sustainable economic growth and competitiveness (FWEP) required to include details of how flood warnings will be provided, what will be done to protect the development and its contents, and how safe occupancy and access to and from the development will be achieved.</td><td>Yes - It may be necessary in the following cases:
• Sites of particularly significant surface water flood risk.
• Where the site is located within a dry island (i.e. the area surrounding the site and/or any potential egress routes away from the site may be at risk of flooding during the 1% annual probability (1 in 100 year) flood event including an allowance for climate change even if the site itself is not).</td><td>Section 8.5</td></tr>
</table>

33 Defra, March 2015, Non-statutory technical standards for sustainable drainage systems. https://www.gov.uk/government/publications/sustainable-drainage-systems-non-statutory-technical-standards

34 Available at: https://www.gov.uk/government/publications/personal-flood-plan

	All Development	Minor development				Other development				SFRA section
	Flood Zone 3b (Undeveloped – Functional Floodplain)	Flood Zone 3b (Developed)	Flood Zone 3a	Flood Zone 2	Flood Zone 1	Flood Zone 3b (Developed)	Flood Zone 3a	Flood Zone 2	Flood Zone 1	
Planning conditions	N/A	Conditions to secure the implementation of measures set out in the FRA. Condition to prevent conversion of a non-habitable basement to a habitable space at a later date. Condition to keep voids clear.			Conditions to secure the implementation of measures set out in the FRA.	Conditions to secure the implementation of measures set out in the FRA. Condition to prevent conversion of a non-habitable basement to a habitable space at a later date. Condition to keep voids clear.			Conditions to secure the implementation of measures set out in the FRA.	Section 9.2
Permitted development rights	N/A	Consider the removal of permitted development rights on a case-by-case basis having regard to the remaining amount of development that could be achieved without planning permission and the level of risk.			N/A	Remove permitted development rights.			N/A	Section 9.2
Consult the Environment Agency[35] and/or Lead Local Flood Authority	N/A	Consult the Environment Agency: • If development (including boundary walls) is within 20m of the top of bank of a Main River, consult Environment Agency on flood defence requirements. Consult the Lead Local Flood Authority: • -If development is within 8 m of an Ordinary Watercourse		Consult Environment Agency: • If application site >1 hectare • If development (including boundary walls) is within 20m of the top of bank of a Main River, consult Environment Agency on flood defence requirements. Consult the Lead Local Flood Authority: • If development is within 8 m of an Ordinary Watercourse	Consult Environment Agency; •If application site > 1 hectare. •If development (including boundary walls) is within 20m of the top of bank of a Main River, on flood defence requirements. Consult the Lead Local Flood Authority: •If development is within 8m of an Ordinary Watercourse	Consult the Environment Agency: • On all applications • If development (including boundary walls is within 20m of a Main River, consult Environment Agency on flood defence requirements. • Change of use where flood risk vulnerability classification has changed to more vulnerable or highly vulnerable or from water compatible to less vulnerable Consult Lead Local Flood Authority: • If development is 'major', consult on 'Surface Water Drainage Statement' • If development is within 8m of an Ordinary Watercourse	Consult the Environment Agency: • If application site >1 hectare. • Essential infrastructure. • Highly vulnerable. • More Vulnerable and it's a landfill or waste facility or is a caravan site. • Less Vulnerable and it's one of the following: land or building used for agriculture or forestry; a waste treatment site; a mineral processing site, as waste water treatment plant or a sewage treatment plant. • If development (including boundary walls) is within 20m of the top of bank of a Main River, consult Environment Agency on flood defence requirements. Consult the Lead Local Flood Authority: • If development is 'major' consult on 'Surface Water Drainage Statement'. • If development is within 8m of an Ordinary Watercourse.	Consult Environment Agency ; • Application site > 1 hectare. • If development (including boundary walls) is within 20m of the top of bank of a Main River. Consult the Lead Local Flood Authority: • If development is 'major' consult on 'Surface Water Drainage Statement'. • If development is within 8m of an Ordinary Watercourse • If Major development	Section 7.6

35 Government guidance for LPAs regarding when to consult the Environment Agency https://www.gov.uk/flood-risk-assessment-local-planning-authorities.

10 Conclusions

10.1 Need for SWMP

In the past, when a flood (from any source) has occurred in WODC, the District has investigated and when deemed necessary have reported on the issue. Following flooding in 2007 WODC published a series of 'Parish Flood Reports' which describe flooding from all sources. The reports included an action plan, and in 2015 an update was provided to outline works completed to date.

Following the 2007 flooding, the Pitt Review was held and a number of legislative changes came about including the Flood and Water Management Act which places the responsibility for recording and investigating flood events onto OCC as LLFA. However, WODC still play an active role in local flood risk management and it may be considered that a Surface Water Management Plan (SWMP) would be useful to provide one reference point for a detailed description of surface water flood risk.

A SWMP is a plan which outlines the preferred surface water management strategy in a given location; where surface water is defined as flooding from sewers, drains, groundwater and runoff from land small watercourses and ditches that occurs as a result of heavy rainfall. The aim of a SWMP is to establish a long term action plan to manage surface water in an area to be used to influence future capital investment, drainage maintenance, public engagement and understanding as well as informing future development. There is no statutory requirement for WODC to create a SWMP.

If it is progressed, reporting may be based on existing EA data validated against local flood records. However, there are limitations to the EA National mapping including the following which may influence flood outlines in WODC

- Assume a free outfall and does not take into account high river levels which may prevent surface water from draining away freely (as occurred in 2007 at confluences with the River Thames)
- Mapping does not take into account individual property threshold heights so the map shows are that may flood but can't accurately predict the impacts on individual properties
- Mapping is not suitable for use at individual property level and cannot be reproduced at scales greater than 1:10,000

Currently, when the need for a scheme to reduce flood risk is identified, the Parish Flood Group can raise this to the West Oxfordshire Flood Group which will present it to the Lead Local Flood Authority (OCC) Strategic Flooding Group where potential funding will be discussed further. The parish reports have to date completed the role that a SWMP would provide.

As lead local flood authority it is OCC that must develop, maintain, apply and monitor a strategy for local flood risk management in its area to include surface water, groundwater and ordinary watercourses. This is their Local Flood Risk Management Strategy.

10.2 Definition of Critical Drainage Areas

A critical drainage area is defined as *'A discrete geographic area (usually a hydrological catchment) where multiple and interlinked sources of flood risk (surface water, groundwater, sewer, main river and/or tidal) cause flooding in one or more Local Flood Risk Zones during severe weather thereby affecting people, property or local infrastructure'.*

NPPF guidance outlines that a FRA is required for a site located within Flood Zone 1, if it is over 1ha or if it is located within a critical drainage area. The EA have confirmed that they have not notified WODC of any critical drainage areas in West Oxfordshire. This position is continually monitored between WODC and the EA.

Appendix A.Thames Basin Area Climate Change Allowances

Thames Area Climate Change Allowances

Guidance for their use in flood risk assessments

August 2016

We recently updated our national guidance on climate change allowances for Flood Risk Assessments. This document should be used together with that guidance to inform developments within our Thames area boundary.

Climate change allowances - overview

The government's Planning Practice Guidance refers planners, developers and advisors to the Environment Agency to our guidance on considering climate change in Flood Risk Assessments. We updated this guidance in February 2016 and it should be read in conjunction with this document to inform planning applications, local plans, neighbourhood plans and other projects. It provides:

- Climate change allowances for peak river flow, peak rainfall, sea level rise, wind speed and wave height
- A range of allowances to assess fluvial flooding, rather than a single national allowance
- Advice on which allowances to use for assessments based on vulnerability classification, flood zone and development lifetime

Updated climate change allowances guidance:

https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Planning Practice Guidance:

http://planningguidance.communities.gov.uk/

Assessing climate change impacts on fluvial flooding

Table A below indicates the level of technical assessment of climate change impacts on fluvial flooding appropriate for new developments depending on their scale and location (flood zone). Please note that this should be used as a guide only.

Ultimately, the agreed approach should be based on expert local knowledge of flood risk conditions, local sensitivities and other influences. For these reasons we recommend that applicants and consultants contact the Environment Agency at the pre-planning application stage to confirm the assessment approach on a case-by-case basis.

Table A defines three possible approaches to account for flood risk impacts due to climate change in new development proposals:

1. **Basic**

   Developer can add an allowance to the 'design flood' (i.e. 1% annual probability) peak levels to account for potential climate change impacts. The allowance should be derived and agreed locally by Environment Agency teams.

2. **Intermediate**

   Developer can use existing modelled flood and flow data to construct a stage-discharge rating curve, which can be used to interpolate a flood level based on the required peak flow allowance to apply to the ‘design flood’ flow.

3. **Detailed**

   Perform detailed hydraulic modelling, through either re-running Environment Agency hydraulic models (if available) or construction of a new model by the developer.

Table A – Indicative guide to assessment approach

Vulnerability classification	Flood zone	Assessment by development type		
		Minor	Small-Major	Large-Major
Essential infrastructure	Zone 2	Detailed		
	Zone 3a	Detailed		
	Zone 3b	Detailed		
Highly vulnerable	Zone 2	Intermediate/Basic	Intermediate/Basic	Detailed
	Zone 3a	Not appropriate development		
	Zone 3b	Not appropriate development		
More vulnerable	Zone 2	Basic	Basic	Intermediate/Basic
	Zone 3a	Basic	Detailed	Detailed
	Zone 3b	Not appropriate development		
Less vulnerable	Zone 2	Basic	Basic	Intermediate/Basic
	Zone 3a	Basic	Basic	Detailed
	Zone 3b	Not appropriate development		
Water compatible	Zone 2	None		
	Zone 3a	Intermediate/Basic		
	Zone 3b	Detailed		

Definitions of terms in Table A

Minor

1-9 dwellings/less than 0.5 ha; office/light industrial under 1ha; general industrial under 1 ha; retail under 1 ha; travelling community site between 0 and 9 pitches.

Small-Major

10 to 30 dwellings; office/light industrial 1ha to 5ha; general industrial 1ha to 5ha; retail over 1ha to 5ha; travelling community site over 10 to 30 pitches.

Large-Major

30+ dwellings; office; light industrial 5ha+; general industrial 5ha+; retail 5ha+; gypsy/traveller site over 30+ pitches; any other development that creates a non-residential building or development over 1000 sqm.

Further info on vulnerability classifications:

http://planningguidance.communities.gov.uk/blog/guidance/flood-risk-and-coastal-change/flood-zone-and-flood-risk-tables/table-2-flood-risk-vulnerability-classification/

Further info on flood zones:

http://planningguidance.communities.gov.uk/blog/guidance/flood-risk-and-coastal-change/flood-zone-and-flood-risk-tables/table-2-flood-risk-vulnerability-classification/

Specific local considerations

Where the Environment Agency and the applicant or their consultant has agreed that a basic level of assessment is appropriate, the figures in Table B below can be used as an allowance for potential climate change impacts on peak design (i.e. 1% annual probability) fluvial flood level rather than undertaking detailed modelling.

Table B – Local allowances for potential climate change impacts

Watercourse	Central	Higher central	Upper
Thames	500mm	700mm	1000mm

Use of these allowances will only be accepted after discussion with the Environment Agency.

Fluvial food risk mitigation

Please use the national guidance to find out which allowances to use to assess the impact of climate change on flood risk.

For planning consultations where we are a statutory consultee and our Flood Risk Standing Advice does not apply, we use the following benchmarks to inform flood risk mitigation for different vulnerability classifications.

These benchmarks are a guide only. We strongly recommend you contact us at the pre-planning application stage to confirm this on a case-by-case basis. Please note you may be charged for pre-planning advice.

For planning consultations where we are not a statutory consultee or where our Flood Risk Standing Advice does apply, we recommend local planning authorities and developers use these benchmarks but we do not expect to be consulted.

Essential Infrastructure

For these developments, our benchmark for flood risk mitigation is for it to be designed to the **upper end** climate change allowance for the epoch that most closely represents the lifetime of the development, including decommissioning.

Highly Vulnerable

For these developments in flood zone 2, the **higher central** climate change allowance is our minimum benchmark for flood risk mitigation. In sensitive locations it may be necessary to use the **upper end** allowance.

More Vulnerable

For these developments in flood zone 2, the **central** climate change allowance is our minimum benchmark for flood risk mitigation. In flood zone 3 the **higher central** climate change allowance is our minimum benchmark for flood risk mitigation. In sensitive locations it may be necessary to use the **higher central** (in flood zone 2) and the **upper end** allowance (in flood zone 3).

Water Compatible or Less Vulnerable

For these developments, the **central** climate change allowance for the epoch that most closely represents the lifetime of the development is our minimum benchmark for flood risk mitigation. In sensitive locations it may be necessary to use the **higher central** to inform built in resilience, particularly in flood zone 3.

Further info on our Flood Risk Standing Advice:

https://www.gov.uk/guidance/flood-risk-assessment-local-planning-authorities

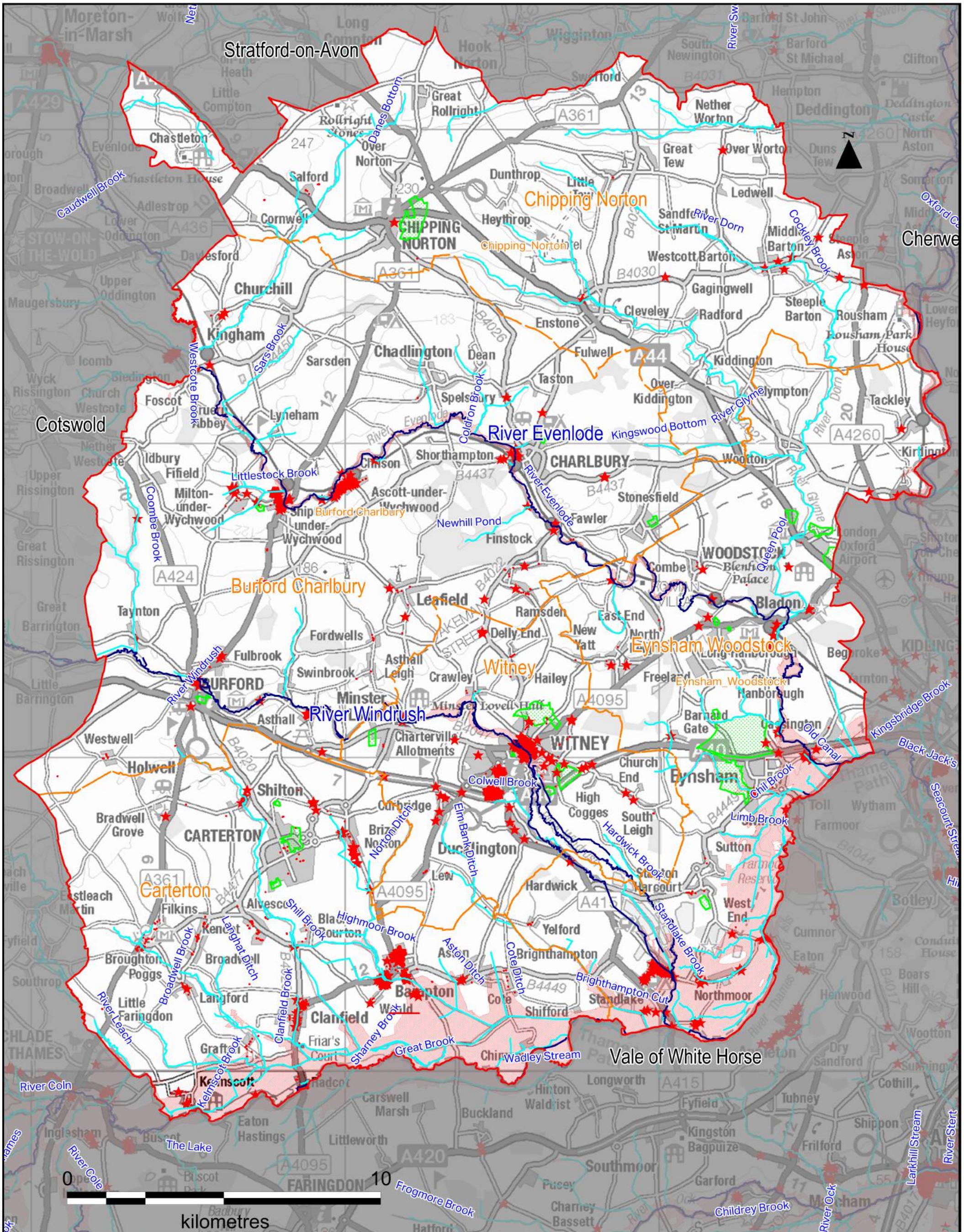
There may be circumstances where local evidence supports the use of other data or allowances. Where you think this is the case we may want to check this data and how you propose to use it.

For more information

Please contact our Thames area Customers and Engagement team:

WTEnquiries@environment-agency.gov.uk

Appendix B – Mapping



LEGEND

- Local Planning Authority boundary
- Settlement Area boundary
- Main Rivers
- Open Ordinary Watercourses
- Local Plan Potential Development Sites
- Environment Agency Historic Flood Map (Fluvial Flooding)
- Oxfordshire County Council Flood Records

Revision Details			
	SEB / SL	November 2016	Ruffix

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

Scale at A3: 1:110,000

Drawn	SEB	Checked	Sarah Littlewood
Approved	Sarah Kelly	Date	14/11/2016

Purpose of Issue: FINAL ISSUE

Project Title: WEST OXFORDSHIRE DISTRICT COUNCIL STRATEGIC FLOOD RISK ASSESSMENT

Drawing Title: LEVEL 1 SFRA STUDY AREA

AECOM Internal Project No.: 60505363

Client: WEST OXFORDSHIRE DISTRICT COUNCIL

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Drawing Number: FIGURE 1

Rev: 02

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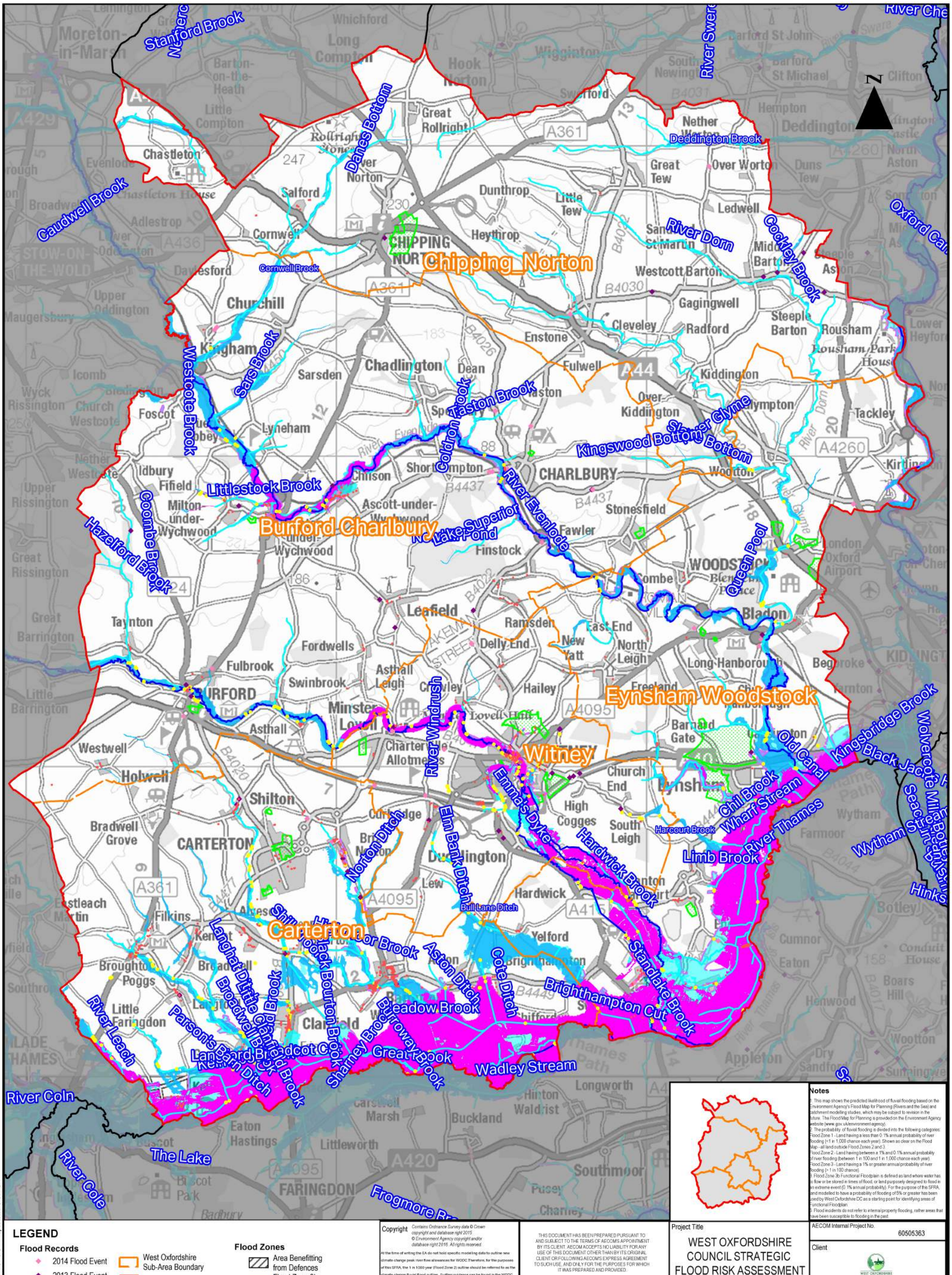

Stanford Brook
Caudwell Brook
Danes Bottom
Cornwell Brook
Chipping_Norton
Deddington Brook
River Dorn
Cockley Brook
Oxford Canal
River Cherwell
River Swere
Westcote Brook
Sars Brook
Coldron Brook
Taston Brook
Kingswood Bottom
Glyme
Bottom
Littlestock Brook
River Evenlode
Burford Charlbury
Lake Superior
Pond
Hazelford Brook
Coombe Brook
Queen Pool
Eynsham Woodstock
Kingsbridge Brook
Black Jack's
Wolvercote Mill Stream
Seacourt
Old Canal
Chil Brook
Wharf Stream
River Thames
Wytham Stream
Harcourt Brook
Limb Brook
Hinksey
River Windrush
Witney
Emma's Dyke
Hardwick Brook
Norton Ditch
Elm Bank Ditch
Bull Lane Ditch
Carterton
Aston Ditch
Cote Ditch
Brighthampton Cut
Standlake Brook
Meadow Brook
Great Brook
Burroway Brook
Sharney Brook
Black Bourton Brook
Langhat Ditch
Broadwell Brook
Parson's Brook
River Leach
Kelmscott
Wadley Stream
River Coln
The Lake
River Cole
Frogmore Brook
N

Notes

1. This map shows the predicted likelihood of fluvial flooding based on the Environment Agency's Flood Map for Planning (Rivers and the Sea) and catchment modelling studies, which may be subject to revision in the future. The Flood Map for Planning is provided on the Environment Agency website (www.gov.uk/environment-agency).
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5. Flood incidents do not refer to internal property flooding, rather areas that have been susceptible to flooding in the past.

LEGEND

Flood Records
- 2014 Flood Event
- 2013 Flood Event
- 2007 Flood Event
- Historic Flood Map
- WODC Flood Defence Assets
- Ordinary Watercourse
- Main River
- West Oxfordshire Sub-Area Boundary
- West Oxfordshire DC Boundary
- Administraive Boundary
- LP Potential Development Sites

Flood Zones
- Area Benefitting from Defences
- Flood Zone 3b Functional Floodplain
- Flood Zone 3 High Probability
- Flood Zone 2 Medium Probability

At the time of writing the EA do not hold specific modelling data to outline new climate change peak river flow allowances for WODC. Therefore, for the purposes of this SFRA, the 1 in 1000 year (Flood Zone 2) outline should be referred to as the climate change fluvial flood outline. Further guidance can be found in the WODC updated SFRA Section 2.5 and Appendix A

Revision Details	SEB / SL	Nov 2016	Suffix

Intended Use
This map is intended to provide a strategic overview of fluvial flood risk and should not be used to assess flood risk for individual properties.

Project Title: WEST OXFORDSHIRE COUNCIL STRATEGIC FLOOD RISK ASSESSMENT

AECOM Internal Project No. 60505363

Client: WEST OXFORDSHIRE DISTRICT COUNCIL

Scale at A3: 1:110,000
Drawn: SEB | Checked: SL
Approved: SK | Date: November 2016

Purpose of Issue: FINAL ISSUE

Drawing Title: FLOOD RISK FROM RIVERS OVERVIEW

AECOM
Sunley House
4 Bedford Park
Croydon
CR0 2AP
T +44-(0)-20 8639 3500

Drawing Number: FIGURE 2 | Rev: 02

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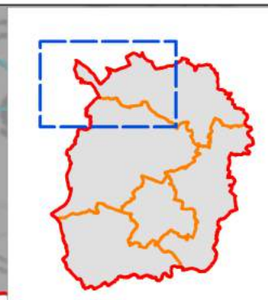

Notes

1. This map shows the predicted likelihood of fluvial flooding based on the Environment Agency's Flood Map for Planning (Rivers and the Sea) and catchment modelling studies, which may be subject to revision in the future. The Flood Map for Planning is provided on the Environment Agency website (www.gov.uk/environment-agency)
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5. Flood incidents do not refer to internal property flooding, rather areas that have been susceptible to flooding in the past

LEGEND

- 2014 Flood Event
- 2013 Flood Event
- 2007 Flood Event
- Historic Flood Map
- WODC Flood Defence Assets
- Ordinary Watercourse
- Main River
- Area Benefitting from Defences
- Flood Zone 3b Functional Floodplain
- Flood Zone 3 High Probability
- Flood Zone 2 Medium Probability
- West Oxfordshire Sub-Area Boundary
- West Oxfordshire DC Boundary
- Administraive Boundary
- LP Potential Development Sites

At the time of writing the EA do not hold specific modelling data to outline new climate change peak river flow allowances for WODC. Therefore, for the purposes of this SFRA, the 1 in 1000 year (Flood Zone 2) outline should be referred to as the climate change fluvial flood outline. Further guidance can be found in the WODC updated SFRA Section 2.5 and Appendix A'

Revision Details	SEB / EC	November 2016	Suffix

Purpose of Issue

FINAL ISSUE

Client

WEST OXFORDSHIRE DISTRICT COUNCIL

Project Title

WEST OXFORDSHIRE STRATEGIC FLOOD RISK ASSESSMENT UPDATE

Drawing Title

FLOOD RISK FROM RIVERS

Drawn	Checked	Approved	Date
SEB	SL	EC	November 2016

AECOM Internal Project No. 60505363 — Scale at A3 1:55,000

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Sunley House
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Drawing Number	Rev
FIGURE 2A	02

0 0.5 1 Kilometres

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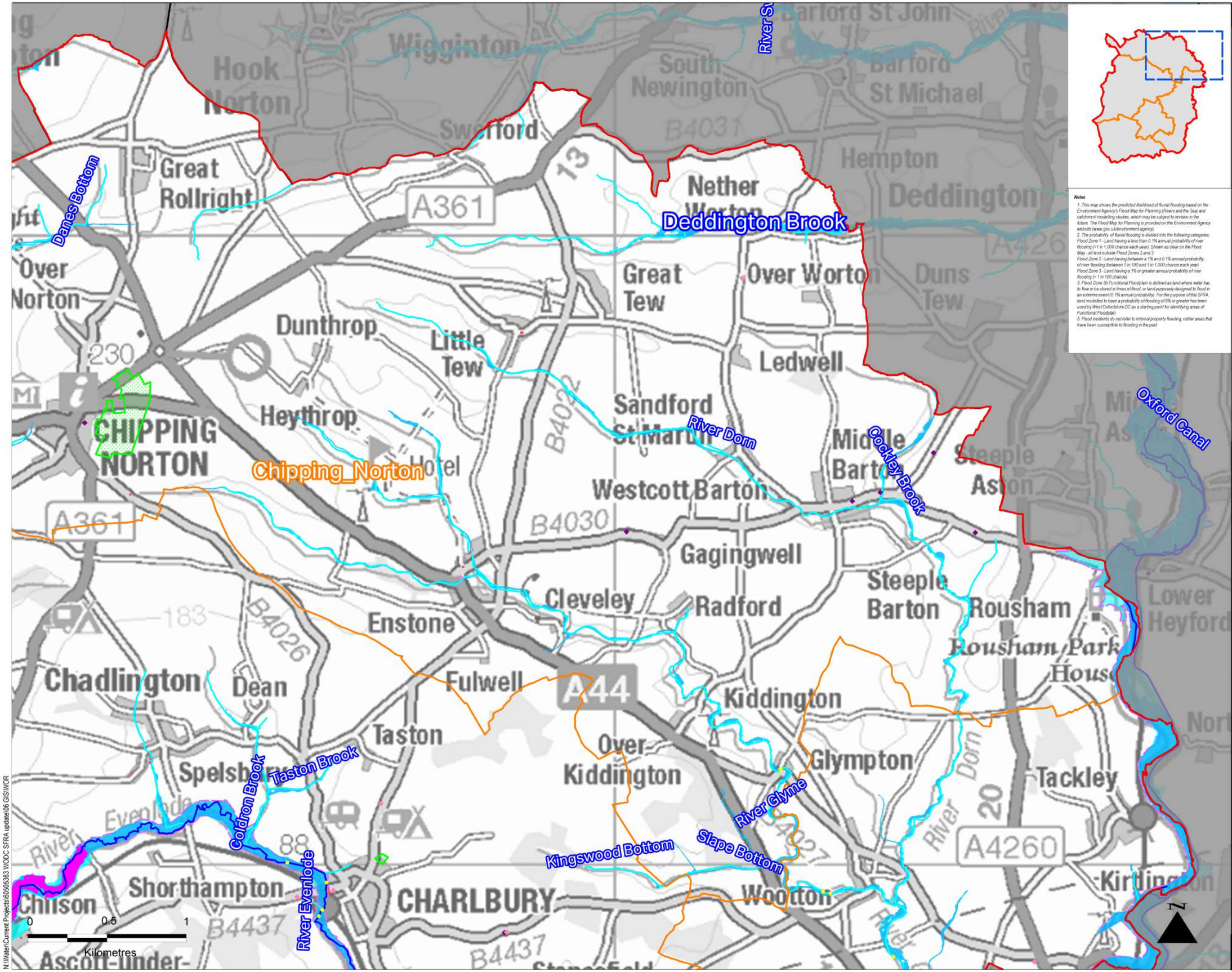

Notes

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5. Flood incidents do not refer to internal property flooding, rather areas that have been susceptible to flooding in the past

LEGEND

- 2014 Flood Event
- 2013 Flood Event
- 2007 Flood Event
- Historic Flood Map
- WODC Flood Defence Assets
- Ordinary Watercourse
- Main River
- Area Benefitting from Defences
- Flood Zone 3b Functional Floodplain
- Flood Zone 3 High Probability
- Flood Zone 2 Medium Probability
- West Oxfordshire Sub-Area Boundary
- West Oxfordshire DC Boundary
- Administraive Boundary
- LP Potential Development Sites

At the time of writing the EA do not hold specific modelling data to outline new climate change peak river flow allowances for WODC. Therefore, for the purposes of this SFRA, the 1 in 1000 year (Flood Zone 2) outline should be referred to as the climate change-fluvial flood outline. Further guidance can be found in the WODC updated SFRA Section 2.5 and Appendix A'

Revision Details	SEB / EC	November 2016	Suffix

Purpose of Issue: FINAL ISSUE

Client: WEST OXFORDSHIRE DISTRICT COUNCIL

Project Title: WEST OXFORDSHIRE STRATEGIC FLOOD RISK ASSESSMENT UPDATE

Drawing Title: FLOOD RISK FROM RIVERS

Drawn	Checked	Approved	Date
SEB	SL	EC	November 2016

AECOM Internal Project No. 60505363 | Scale at A3 1:55,000

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Drawing Number: FIGURE 2B | Rev: 02

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LEGEND

- 2014 Flood Event
- 2013 Flood Event
- 2007 Flood Event
- Historic Flood Map
- WODC Flood Defence Assets
- Ordinary Watercourse
- Main River
- Area Benefitting from Defences
- Flood Zone 3b Functional Floodplain
- Flood Zone 3 High Probability
- Flood Zone 2 Medium Probability
- West Oxfordshire Sub-Area Boundary
- West Oxfordshire DC Boundary
- Administraive Boundary
- LP Potential Development Sites

Notes

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At the time of writing the EA do not hold specific modelling data to outline new climate change peak river flow allowances for WODC. Therefore , for the purposes of this SFRA, the 1 in 1000 year (Flood Zone 2) outline should be referred to as the climate change fluvial flood outline. Further guidance can be found in the WODC updated SFRA Section 2.5 and Appendix A'

Revision Details	SEB / EC	November 2016	Suffix

Purpose of Issue: FINAL ISSUE

Client: WEST OXFORDSHIRE DISTRICT COUNCIL

Project Title: WEST OXFORDSHIRE STRATEGIC FLOOD RISK ASSESSMENT UPDATE

Drawing Title: FLOOD RISK FROM RIVERS

Drawn	Checked	Approved	Date
SEB	SL	EC	November 2016

AECOM Internal Project No. 60505363 | Scale at A3 1:55,000

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Drawing Number: FIGURE 2C | Rev: 02

0 0.5 1 Kilometres

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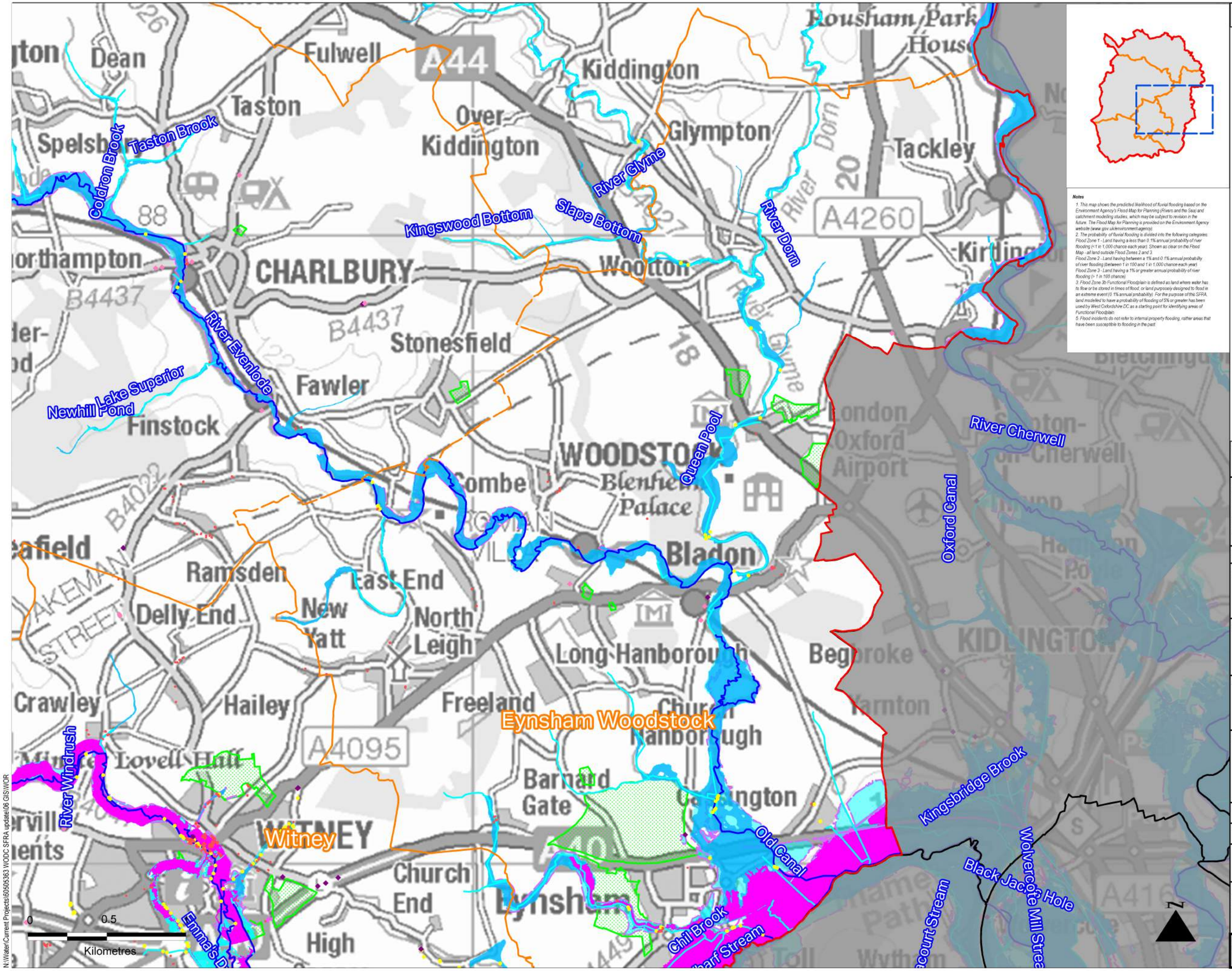

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LEGEND

- 2014 Flood Event
- 2013 Flood Event
- 2007 Flood Event
- Historic Flood Map
- WODC Flood Defence Assets
- Ordinary Watercourse
- Main River
- Area Benefitting from Defences
- Flood Zone 3b Functional Floodplain
- Flood Zone 3 High Probability
- Flood Zone 2 Medium Probability
- West Oxfordshire Sub-Area Boundary
- West Oxfordshire DC Boundary
- Administraive Boundary
- LP Potential Development Sites

Notes

1. This map shows the predicted likelihood of fluvial flooding based on the Environment Agency's Flood Map for Planning (Rivers and the Sea) and catchment modelling studies, which may be subject to revision in the future. The Flood Map for Planning is provided on the Environment Agency website (www.gov.uk/environment-agency)
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Revision Details	SEB / EC	November 2016	Suffix

Purpose of Issue: FINAL ISSUE

Client: WEST OXFORDSHIRE DISTRICT COUNCIL

Project Title: WEST OXFORDSHIRE STRATEGIC FLOOD RISK ASSESSMENT UPDATE

Drawing Title: FLOOD RISK FROM RIVERS

Drawn	Checked	Approved	Date
SEB	SL	EC	November 2016

AECOM Internal Project No. 60505363 | Scale at A3 1:55,000

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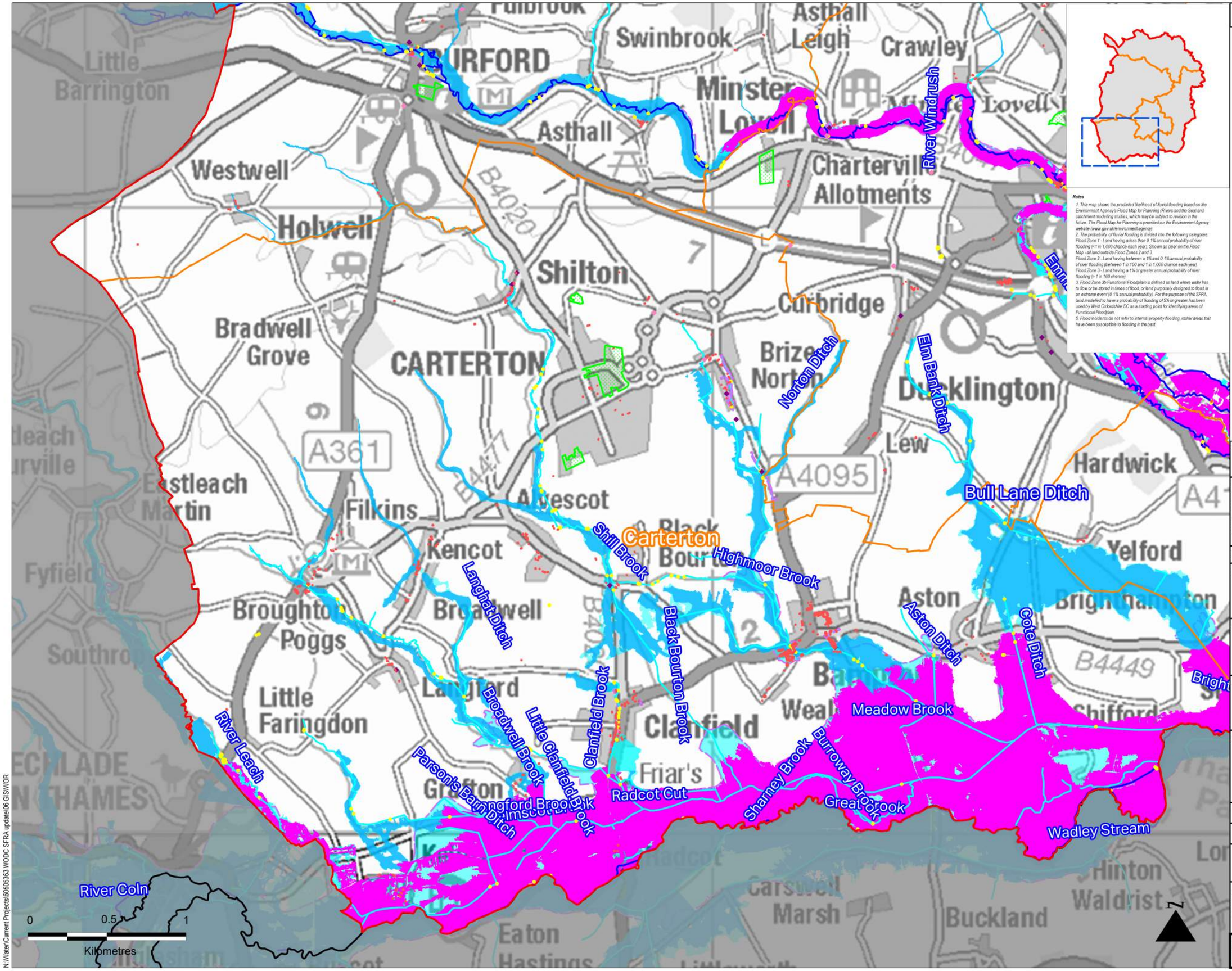

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LEGEND

- 2014 Flood Event
- 2013 Flood Event
- 2007 Flood Event
- Historic Flood Map
- WODC Flood Defence Assets
- Ordinary Watercourse
- Main River
- Area Benefitting from Defences
- Flood Zone 3b Functional Floodplain
- Flood Zone 3 High Probability
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Revision Details	SEB / EC	November 2016	Suffix

Purpose of Issue: FINAL ISSUE

Client: WEST OXFORDSHIRE DISTRICT COUNCIL

Project Title: WEST OXFORDSHIRE STRATEGIC FLOOD RISK ASSESSMENT UPDATE

Drawing Title: FLOOD RISK FROM RIVERS

Drawn	Checked	Approved	Date
SEB	SL	EC	November 2016

AECOM Internal Project No. 60505363 | Scale at A3 1:55,000

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4 Bedford Park
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Drawing Number: FIGURE 2E | Rev: 02

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LEGEND

- 2014 Flood Event
- 2013 Flood Event
- 2007 Flood Event
- Historic Flood Map
- WODC Flood Defence Assets
- Ordinary Watercourse
- Main River
- Area Benefitting from Defences
- Flood Zone 3b Functional Floodplain
- Flood Zone 3 High Probability
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- West Oxfordshire Sub-Area Boundary
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- Administraive Boundary
- LP Potential Development Sites

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Revision Details	SEB / EC	November 2016	Suffix

Purpose of Issue

FINAL ISSUE

Client

WEST OXFORDSHIRE DISTRICT COUNCIL

Project Title

WEST OXFORDSHIRE STRATEGIC FLOOD RISK ASSESSMENT UPDATE

Drawing Title

FLOOD RISK FROM RIVERS

Drawn	Checked	Approved	Date
SEB	SL	EC	November 2016

AECOM Internal Project No.	Scale at A3
60505363	1:55,000

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4 Bedford Park
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Drawing Number	Rev
FIGURE 2F	02

0 0.5 1 Kilometres

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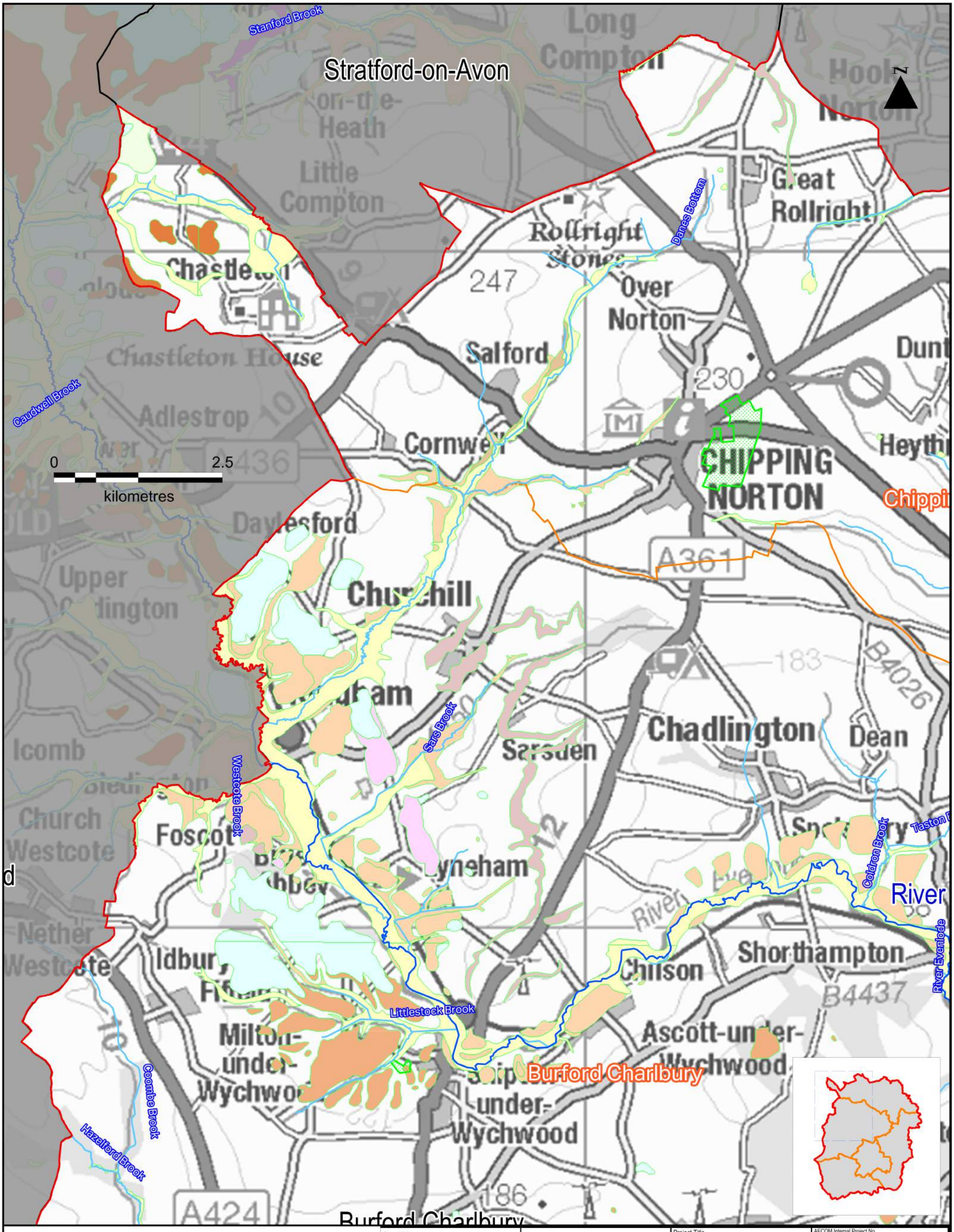

LEGEND

Superficial Deposits

- Alluvium - Clay, Silt, Sand and Gravel
- Northmoor Sand and Gravel Member - Sand and Gravel
- Northern Drift Formation - Sand and Gravel
- Northern Drift Formation - Diamicton
- Glaciofluvial Deposits, Mid Pleistocene - Sand and Gravel

- Local Planning Authority boundary
- Settlement Area boundary
- Main Rivers
- Open Ordinary Watercourses
- LP Potential Development Sites

Revision Details			
	SEB / EC	Nov 2016	Suffix

Intended Use

The 1:50,000 scale digital map data is generalised and the geological interpretation should be used only as a guide to the geology at a local level, not as a site-specific geological plan based on detailed site investigations.

Scale at A3: 1:50,000

Drawn	SEB	Checked	EC
Approved	EC	Date	November 2016

Purpose of Issue: FINAL ISSUE

Project Title: WEST OXFORDSHIRE COUNCIL STRATEGIC FLOOD RISK ASSESSMENT

Drawing Title: SUPERFICIAL DEPOSITS

AECOM Internal Project No. 60505363

Client: WEST OXFORDSHIRE DISTRICT COUNCIL

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4 Bedford Park
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Drawing Number: FIGURE 3D

Rev: 02

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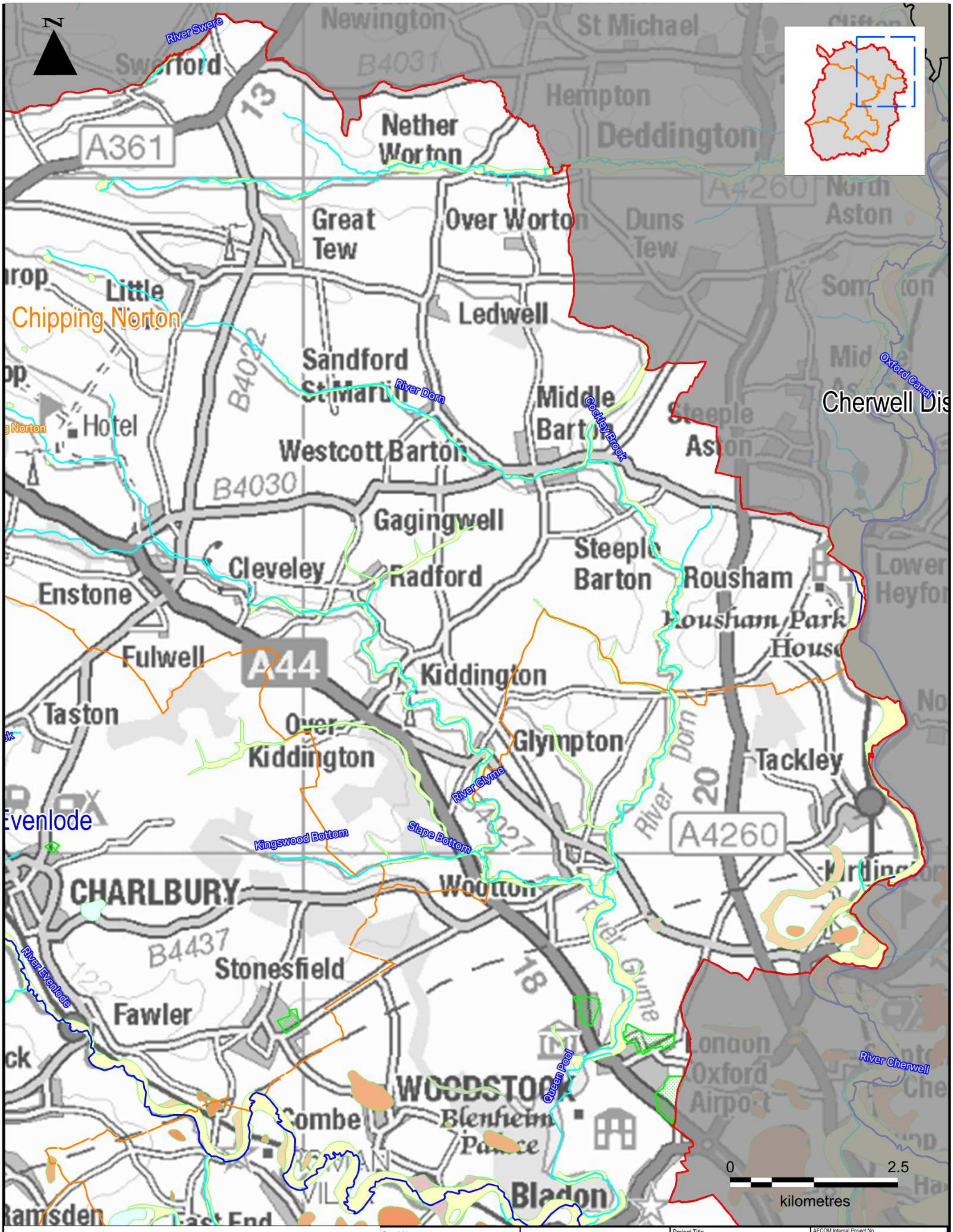

LEGEND

Superficial Deposits

- Alluvium - Clay, Silt, Sand and Gravel
- Northmoor Sand and Gravel Member - Sand and Gravel
- Northern Drift Formation - Sand and Gravel
- Northern Drift Formation - Diamicton
- Glaciofluvial Deposits, Mid Pleistocene - Sand and Gravel

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- Main Rivers
- Open Ordinary Watercourses
- LP Potential Development Sites

Revision Details			Suffix
	SEB / EC	Nov 2016	

Intended Use
The 1:50,000 scale digital map data is generalised and the geological interpretation should be used only as a guide to the geology at a local level, not as a site-specific geological plan based on detailed site investigations.

Scale at A3: 1:50,000

Drawn	SEB	Checked	EC
Approved	EC	Date	November 2016

Purpose of Issue
FINAL ISSUE

Project Title
CHERWELL DISTRICT COUNCIL STRATEGIC FLOOD RISK ASSESSMENT

Drawing Title
BEDROCK GEOLOGY

AECOM Internal Project No.
60505363

Client
WEST OXFORDSHIRE DISTRICT COUNCIL

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Drawing Number
FIGURE 4B

Rev
02

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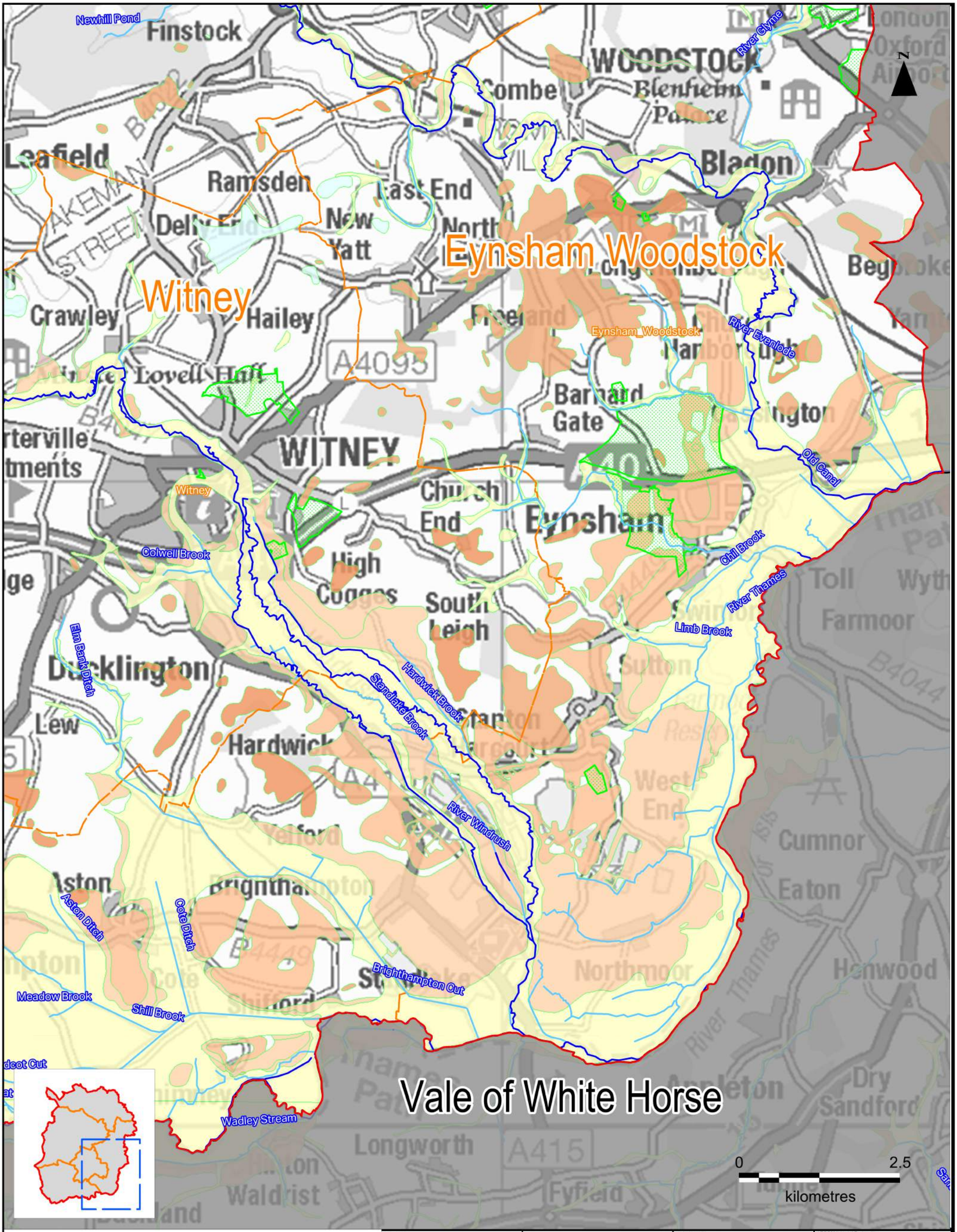

LEGEND

Superficial Deposits

- Alluvium - Clay, Silt, Sand and Gravel
- Northmoor Sand and Gravel Member - Sand and Gravel
- Northern Drift Formation - Sand and Gravel
- Northern Drift Formation - Diamicton
- Glaciofluvial Deposits, Mid Pleistocene - Sand and Gravel

- Local Planning Authority boundary
- Settlement Area boundary
- Main Rivers
- Open Ordinary Watercourses
- LP Potential Development Sites

Revision Details				Suffix
	SEB / EC	Nov 2016		

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Scale at A3: 1:50,000

Drawn	SEB	Checked	EC
Approved	EC	Date	November 2016

Purpose of Issue
FINAL ISSUE

Project Title
CHERWELL DISTRICT COUNCIL STRATEGIC FLOOD RISK ASSESSMENT

Drawing Title
BEDROCK GEOLOGY

AECOM Internal Project No.
60505363

Client
WEST OXFORDSHIRE DISTRICT COUNCIL

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Drawing Number
FIGURE 4C

Rev
02

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N

Coombe Brook

A424

Burford Charlbury

Great Barrington

Little Barrington

Taynton

Fordwells

Fulbrook

Swinbrook

River Windrush

River Windrush

Westwell

Holwell

Shilton

Bradwell Grove

CARTERTON

Carterton

Filkins

Kencot

Brize Norton

Norton Ditch

Shill Brook

Highmoor Brook

Langhat Ditch

Black Bourton Brook

Broadwell Brook

Clanfield Brook

River Leach

Langford Brook

Parson's Barn Ditch

Kelmscot Brook

Radcot Cut

Shamey Brook

Great Brook

River Coln

River Thames

0 2.5

kilometres

LEGEND

Superficial Deposits

- Alluvium - Clay, Silt, Sand and Gravel
- Northmoor Sand and Gravel Member - Sand and Gravel
- Northern Drift Formation - Sand and Gravel
- Northern Drift Formation - Diamicton
- Glaciofluvial Deposits, Mid Pleistocene - Sand and Gravel

- Local Planning Authority boundary
- Settlement Area boundary
- Main Rivers
- Open Ordinary Watercourses
- LP Potential Development Sites

Project Title: CHERWELL DISTRICT COUNCIL STRATEGIC FLOOD RISK ASSESSMENT

AECOM Internal Project No.: 60505363

Client: WEST OXFORDSHIRE DISTRICT COUNCIL

Revision Details				Scale at A3: 1:50,000		
	SEB / EC	Nov 2016	Suffix	Drawn SEB	Checked EC	
				Approved EC	Date November 2016	

Intended Use
The 1:50,000 scale digital map data is generalised and the geological interpretation should be used only as a guide to the geology at a local level, not as a site-specific geological plan based on detailed site investigations.

Purpose of Issue: FINAL ISSUE

Drawing Title: BEDROCK GEOLOGY

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4 Bedford Park
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CR0 2AP
T +44-(0)-20 8639 3500

Drawing Number: FIGURE 4D

Rev: 02

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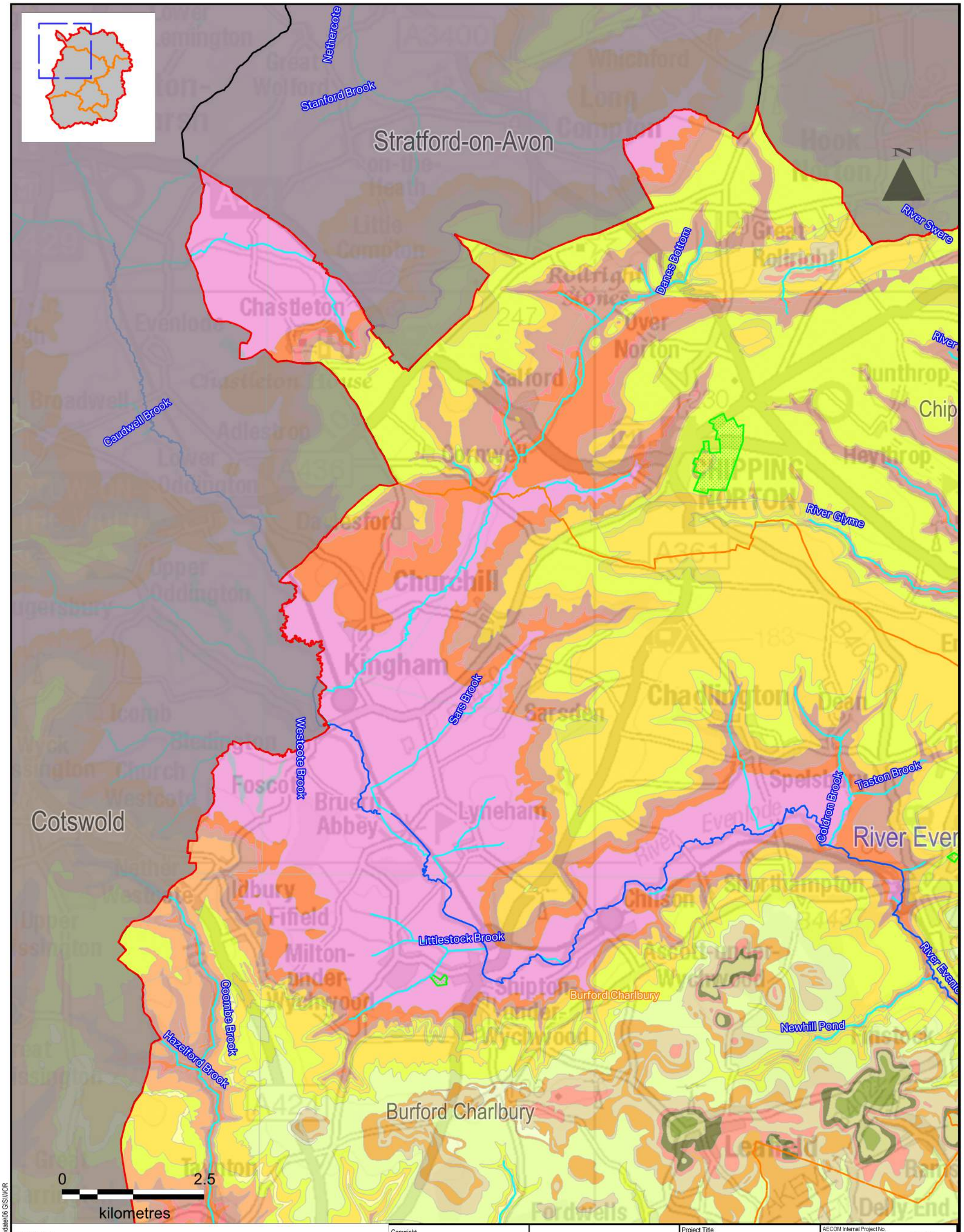

LEGEND

Bedrock Geology

- Great Oolite Group
- Chipping Norton Limestone Formation
- Whitby Mudstone Formation
- Dyrham Formation
- Charmouth Mudstone Formation
- Hampen Formation
- White Limestone Formation
- Peterborough Member
- Forest Marble Formation
- Kellaways Sand Member
- Cornbrash Formation
- Kellaways Clay Member

- Local Planning Authority boundary
- Settlement Area boundary
- Main Rivers
- Open Ordinary Watercourses
- Local Plan Potential Development Sites

Revision Details				Scale at A3:	1:60,000		
	SEB / EC	Nov 2016	Suffix	Drawn	SEB	Checked	EC
				Approved	EC	Date	November 2016

Intended Use

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Purpose of Issue: FINAL ISSUE

Project Title: WEST OXFORDSHIRE COUNCIL STRATEGIC FLOOD RISK ASSESSMENT

Drawing Title: BEDROCK GEOLOGY

AECOM Internal Project No.: 60505363

Client: WEST OXFORDSHIRE DISTRICT COUNCIL

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Drawing Number: FIGURE 4A

Rev: 02

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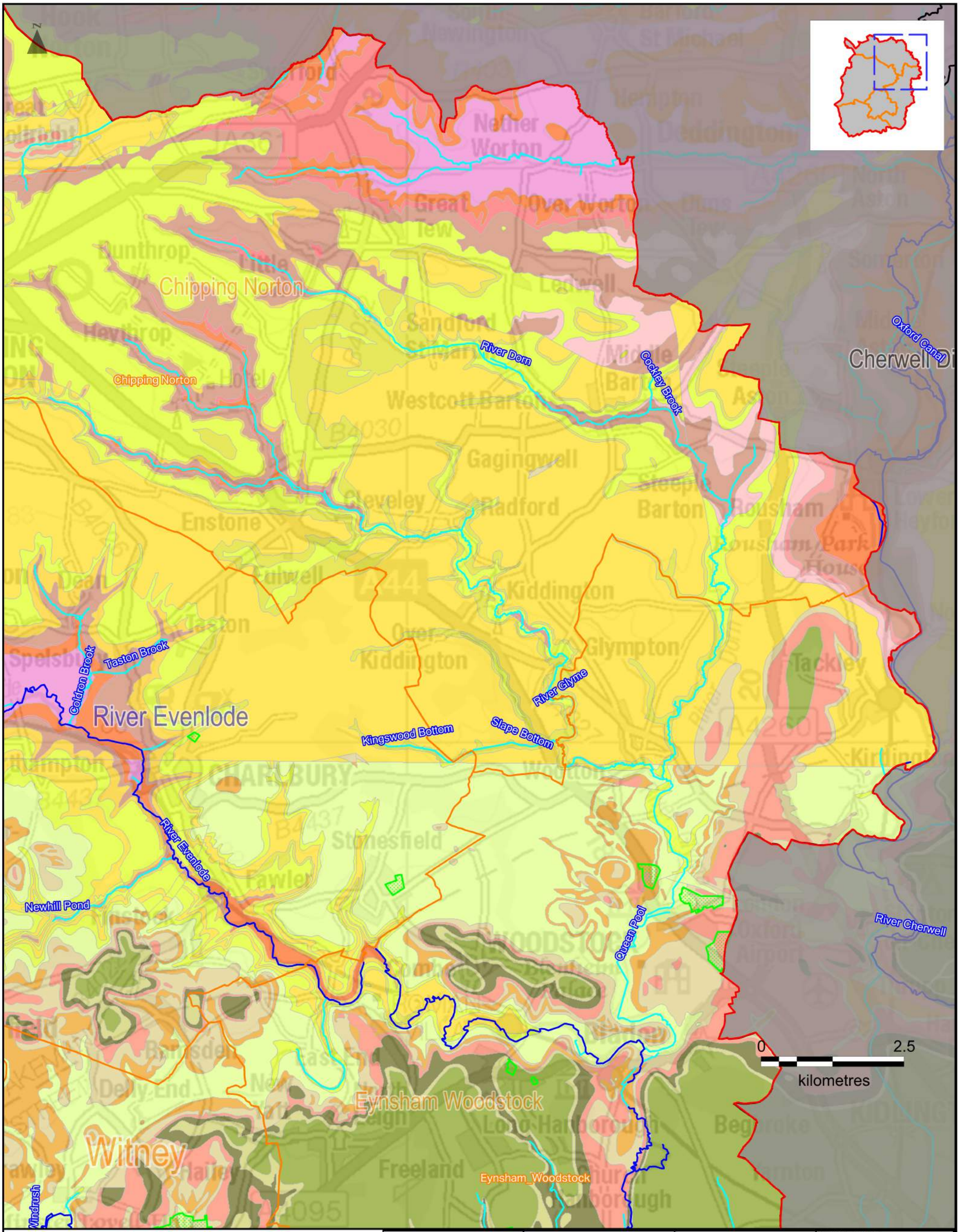

LEGEND

Bedrock Geology

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- Charmouth Mudstone Formation
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- Combrash Formation
- Kellaways Clay Member

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Revision Details				Suffix
	SEB / EC	Nov 2016		

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Scale at A3: 1:60,000

Drawn	SEB	Checked	EC
Approved	EC	Date	November 2016

Purpose of Issue
FINAL ISSUE

Project Title
CHERWELL DISTRICT COUNCIL STRATEGIC FLOOD RISK ASSESSMENT

Drawing Title
BEDROCK GEOLOGY

AECOM Internal Project No.
60505363

Client
WEST OXFORDSHIRE DISTRICT COUNCIL

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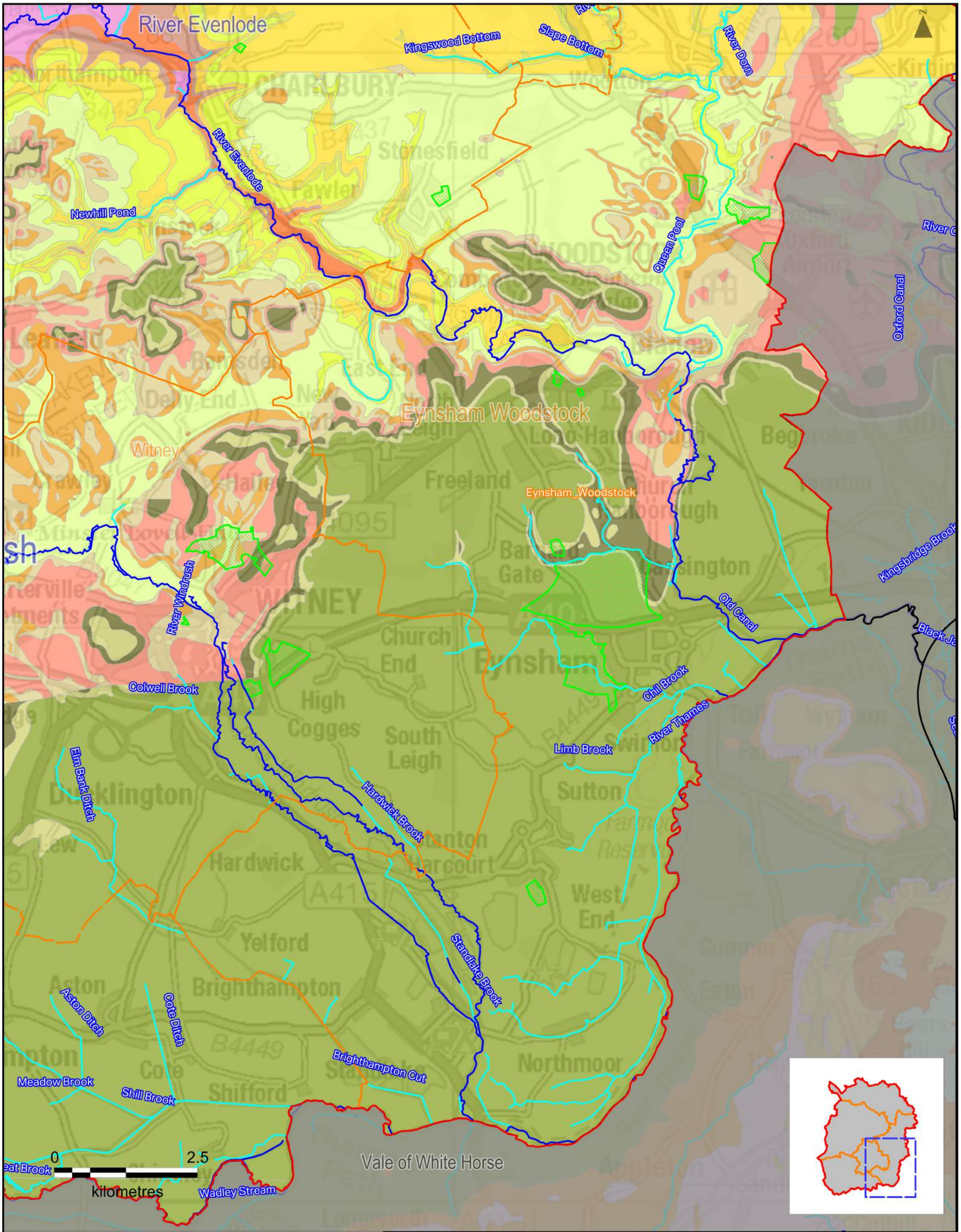
Drawing Number
FIGURE 4B

Rev
02



LEGEND

Bedrock Geology

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- White Limestone Formation
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Revision Details	SEB / EC	Nov 2016	Suffix

Intended Use

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Scale at A3:	1:60,000		
Drawn	SEB	Checked	EC
Approved	EC	Date	November 2016

Purpose of Issue: FINAL ISSUE

Project Title: CHERWELL DISTRICT COUNCIL STRATEGIC FLOOD RISK ASSESSMENT

Drawing Title: BEDROCK GEOLOGY

AECOM Internal Project No.: 60505363

Client: WEST OXFORDSHIRE DISTRICT COUNCIL

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Drawing Number: FIGURE 4C

Rev: 02

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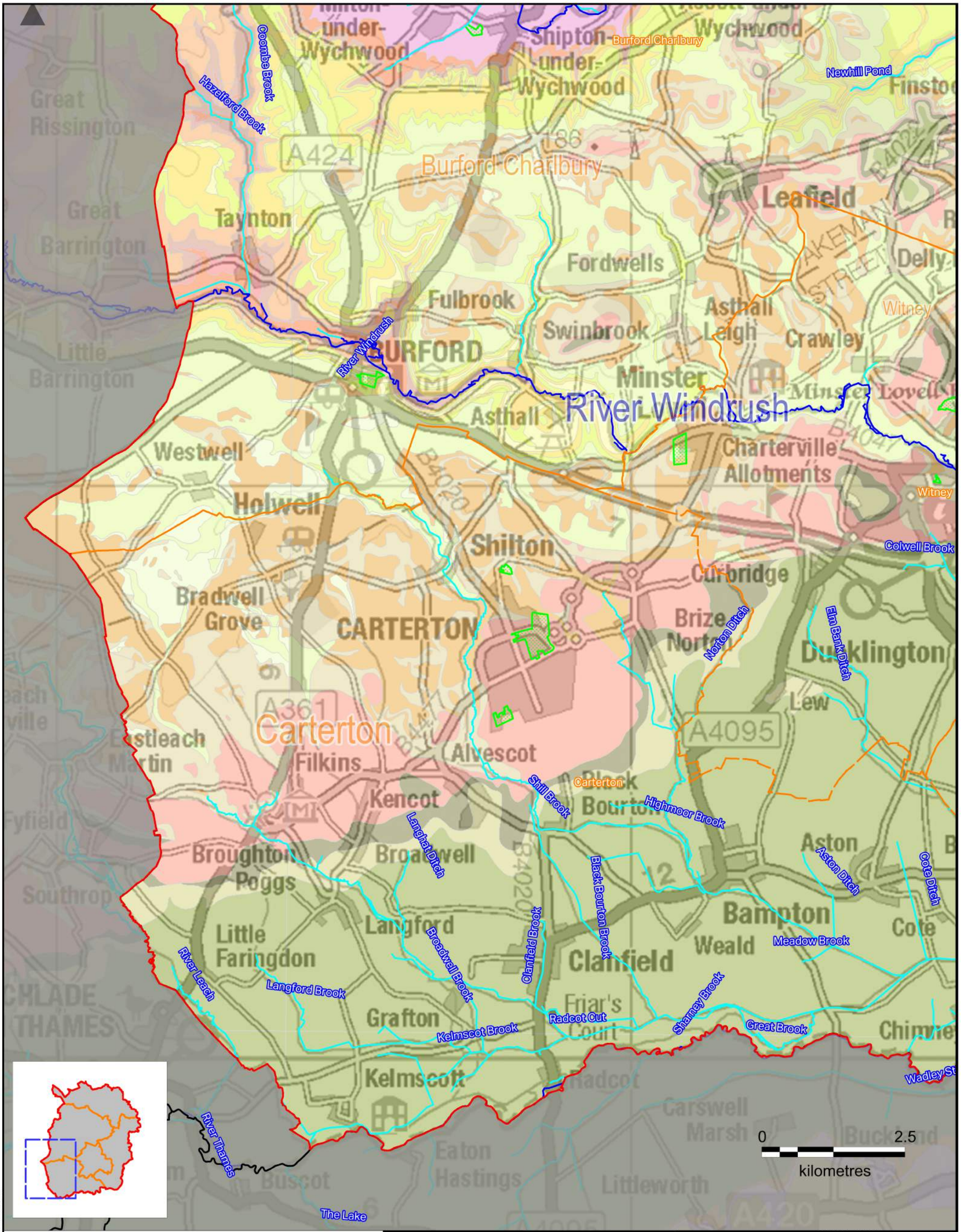

LEGEND

Bedrock Geology

- Great Oolite Group
- Chipping Norton Limestone Formation
- Whitby Mudstone Formation
- Dyrham Formation
- Charmouth Mudstone Formation
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- Forest Marble Formation
- Kellaways Sand Member
- Combrash Formation
- Kellaways Clay Member

- Local Planning Authority boundary
- Settlement Area boundary
- Main Rivers
- Open Ordinary Watercourses
- Local Plan Potential Development Sites

Project Title	CHERWELL DISTRICT COUNCIL STRATEGIC FLOOD RISK ASSESSMENT	AECOM Internal Project No.	60505363
Client	WEST OXFORDSHIRE DISTRICT COUNCIL		
Scale at A3:	1:60,000	Drawing Title	BEDROCK GEOLOGY
Drawn: SEB	Checked: EC		
Approved: EC	Date: November 2016		
Revision Details: SEB/EC	Nov 2016	Suffix	
Intended Use: The 1:50,000 scale digital map data is generalised and the geological interpretation should be used only as a guide to the geology at a local level, not as a site-specific geological plan base on detailed site investigations.	Purpose of Issue: FINAL ISSUE	Drawing Number	FIGURE 4D
		Rev	02

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1. This map shows the predicted likelihood of surface water flooding based on the Environment Agency's updated Flood Map for Surface Water (uFMfSW) data, which may be subject to further analysis in the future. Further information is provided on the Environment Agency website (www.gov.uk/environment-agency).
2. The Risk from Surface Water Flooding is divided into categories:
High: each year, the chance of flooding is greater than 1 in 30 (3.3%).
Medium: each year, the chance of flooding is between 1 in 100 (1%) and 1 in 30 (3.3%).
Low: each year, the chance of flooding is between 1 in 1000 (0.1%) and 1 in 100 (1%).
Very Low: each year, the chance of flooding is less than 1 in 1000 (0.1%).
3. The potential impact of surface water flooding can vary according to the depth of the water, and its velocity (speed and direction that it is flowing in).
4. Surface water flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead. This type of flooding can be difficult to predict as it is hard to forecast exactly where or how much rain will fall in any storm.
5. Flood records do not refer to internal property flooding, rather areas that have been susceptible to flooding in the past. Further detail is included in Table 2-4 of the SFRA Report.

LEGEND

- West Oxfordshire DC Boundary
- Local Planning Authorities
- Main Rivers
- Ordinary Watercourse
- West Oxfordshire Sub-boundary
- LP Potential Development Sites
- High (1:30 AEP)
- Medium (1:100 AEP)
- Low (1:1000 AEP)
- OCC Recorded Flood Incidents

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Project Title: WEST OXFORDSHIRE COUNCIL STRATEGIC FLOOD RISK ASSESSMENT

AECOM Internal Project No. 60505363

Client: WEST OXFORDSHIRE DISTRICT COUNCIL

Revision Details	SEB / SL	Nov 2016	Suffix

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Scale at A3:	1:110,000		
Drawn	SEB	Checked	SL
Approved	EC	Date	November 2016

Purpose of Issue: FINAL ISSUE

Drawing Title: FLOOD RISK FROM SURFACE WATER

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Drawing Number: **FIGURE 5** Rev **02**

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LEGEND

- West Oxfordshire DC Boundary
- Local Planning Authorities
- Main Rivers
- Ordinary Watercourse
- West Oxfordshire Sub-boundary
- LP Potential Development Sites
- High (1:30 AEP)
- Medium (1:100 AEP)
- Low (1:1000 AEP)
- OCC Recorded Flood Incidents

Notes

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Revision Details	SEB / EC	Nov 2016	Suffix

Purpose of Issue: FINAL ISSUE

Client: WEST OXFORDSHIRE DISTRICT COUNCIL

Project Title: WEST OXFORDSHIRE STRATEGIC FLOOD RISK ASSESSMENT UPDATE

Drawing Title: FLOOD RISK FROM SURFACE WATER

Drawn	Checked	Approved	Date
SEB	SL	EC	November 2016

AECOM Internal Project No. 60505363 — Scale at A3 1:55,000

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Drawing Number: FIGURE 5A — Rev: 02

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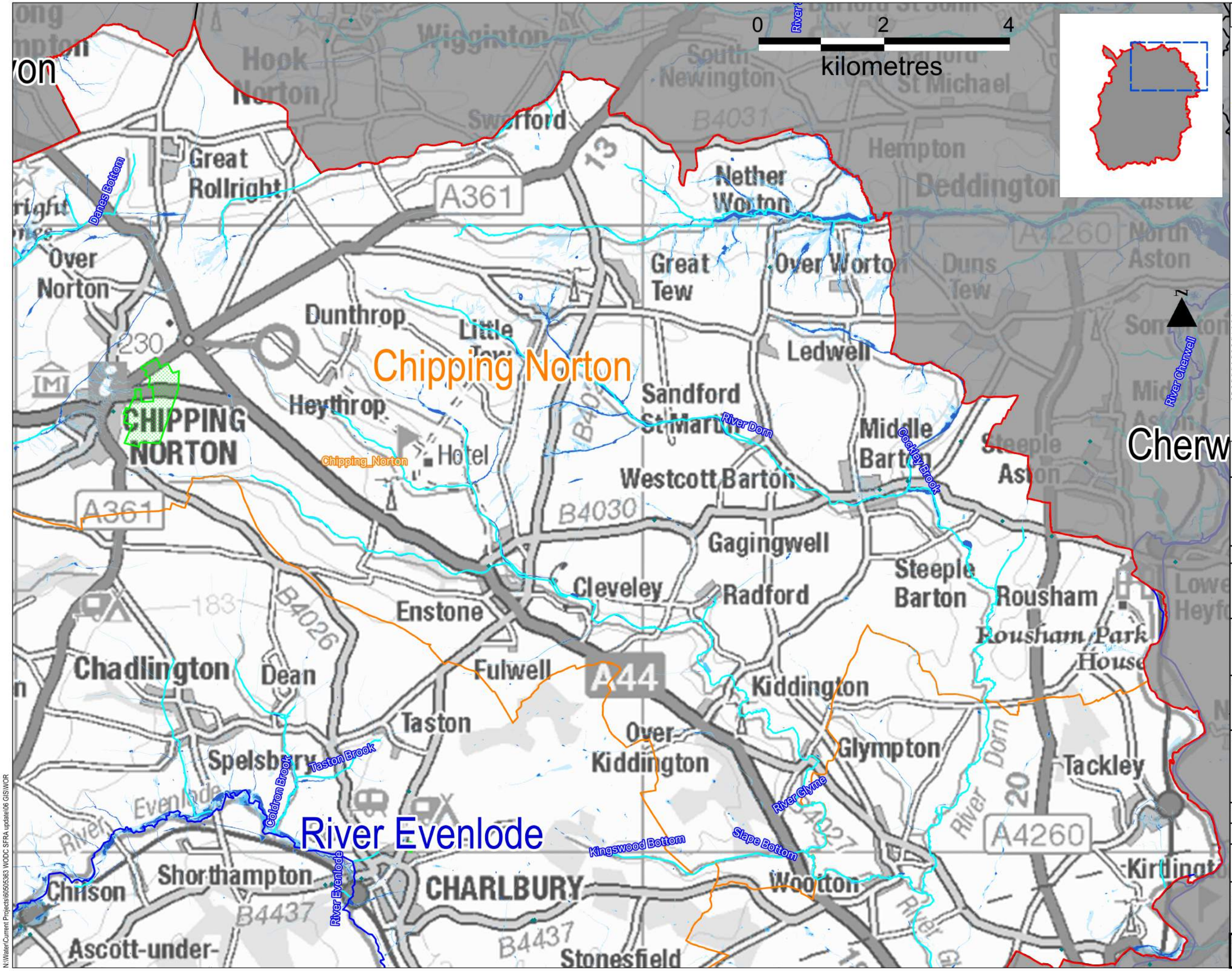

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LEGEND

- West Oxfordshire DC Boundary
- Local Planning Authorities
- Main Rivers
- Ordinary Watercourse
- West Oxfordshire Sub-boundary
- LP Potential Development Sites
- High (1:30 AEP)
- Medium (1:100 AEP)
- Low (1:1000 AEP)
- OCC Recorded Flood Incidents

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Revision Details	SEB / EC	Nov 2016	Suffix

Purpose of Issue: FINAL ISSUE

Client: WEST OXFORDSHIRE DISTRICT COUNCIL

Project Title: WEST OXFORDSHIRE STRATEGIC FLOOD RISK ASSESSMENT UPDATE

Drawing Title: FLOOD RISK FROM SURFACE WATER

Drawn	Checked	Approved	Date
SEB	SL	EC	November 2016

AECOM Internal Project No. 60505363 — Scale at A3 1:55,000

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Drawing Number: FIGURE 5B — Rev: 02

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THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- West Oxfordshire DC Boundary
- Local Planning Authorities
- Main Rivers
- Ordinary Watercourse
- West Oxfordshire Sub-boundary
- LP Potential Development Sites
- High (1:30 AEP)
- Medium (1:100 AEP)
- Low (1:1000 AEP)
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Revision Details	SEB / EC	Nov 2016	Suffix

Purpose of Issue: FINAL ISSUE

Client: WEST OXFORDSHIRE DISTRICT COUNCIL

Project Title: WEST OXFORDSHIRE STRATEGIC FLOOD RISK ASSESSMENT UPDATE

Drawing Title: FLOOD RISK FROM SURFACE WATER

Drawn	Checked	Approved	Date
SEB	SL	EC	November 2016

AECOM Internal Project No. 60505363 | Scale at A3 1:55,000

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Drawing Number: FIGURE 5C | Rev: 02

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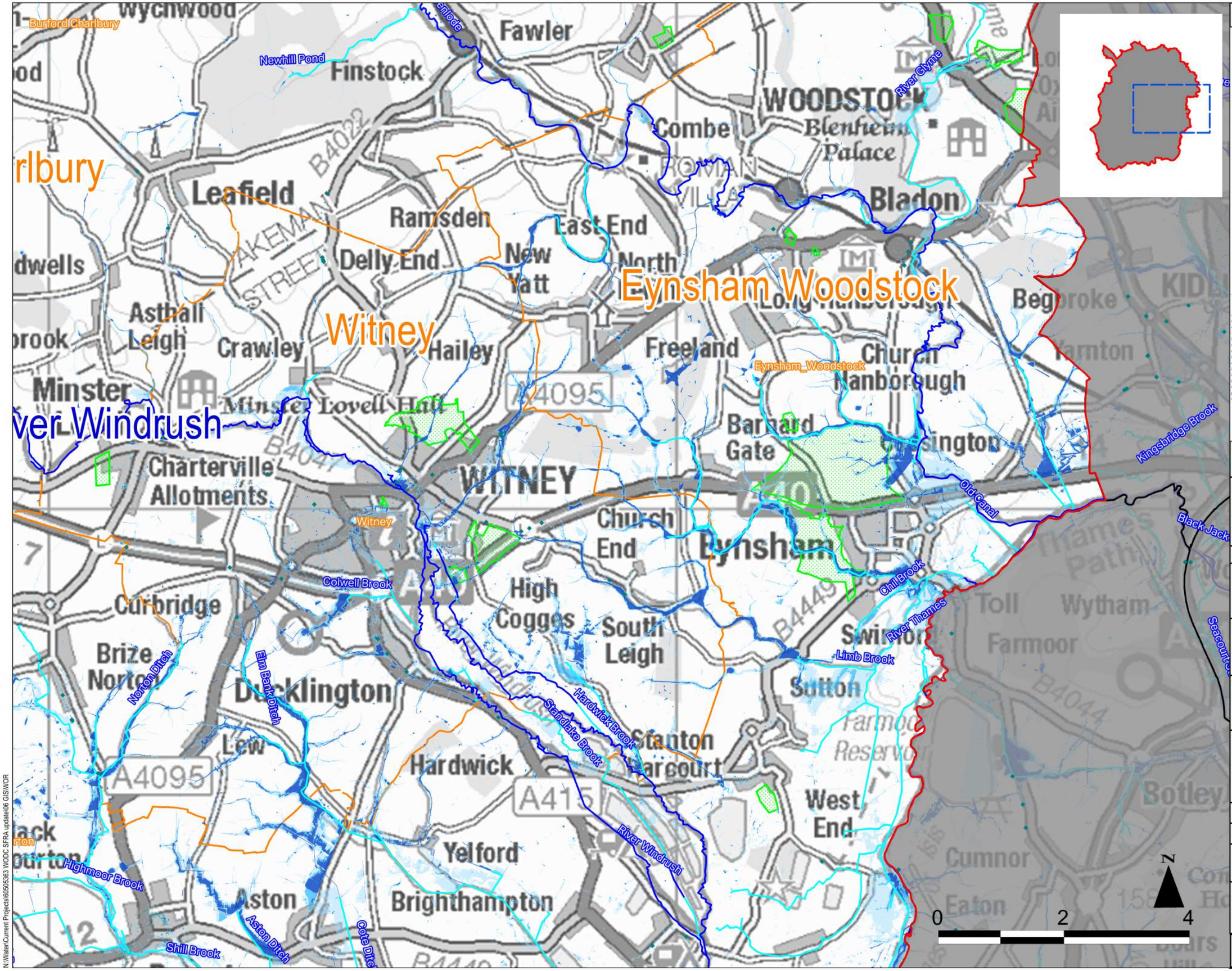

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LEGEND

- West Oxfordshire DC Boundary
- Local Planning Authorities
- Main Rivers
- Ordinary Watercourse
- West Oxfordshire Sub-boundary
- LP Potential Development Sites
- High (1:30 AEP)
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- OCC Recorded Flood Incidents

Notes

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Revision Details	SEB / EC	Nov 2016	Suffix

Purpose of Issue

FINAL ISSUE

Client

WEST OXFORDSHIRE DISTRICT COUNCIL

Project Title

WEST OXFORDSHIRE STRATEGIC FLOOD RISK ASSESSMENT UPDATE

Drawing Title

FLOOD RISK FROM SURFACE WATER

Drawn	Checked	Approved	Date
SEB	SL	EC	November 2016

AECOM Internal Project No.	Scale at A3
60505363	1:55,000

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Drawing Number	Rev
FIGURE 5D	02

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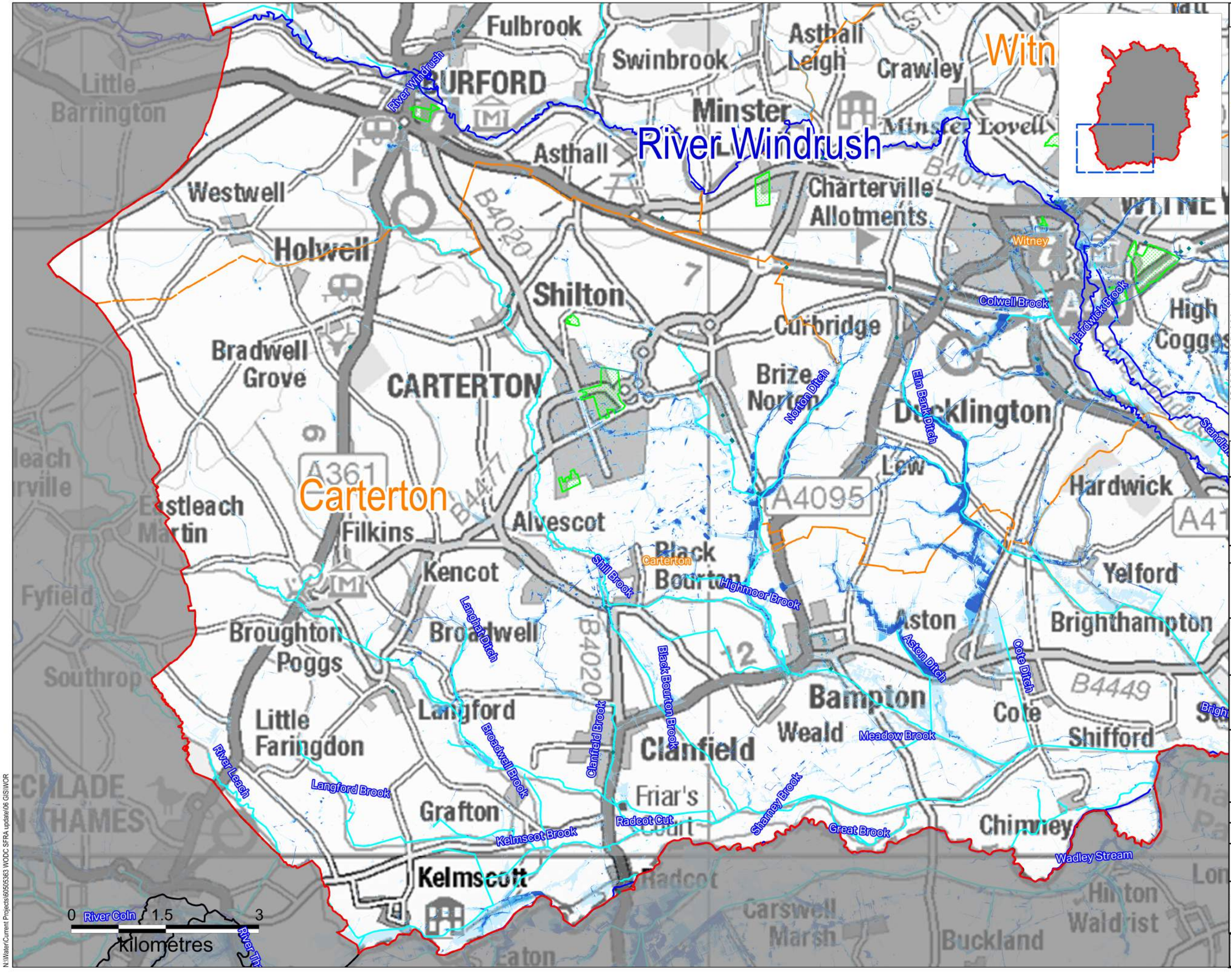

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LEGEND

- West Oxfordshire DC Boundary
- Local Planning Authorities
- Main Rivers
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Revision Details	SEB / EC	Nov 2016	Suffix

Purpose of Issue

FINAL ISSUE

Client

WEST OXFORDSHIRE DISTRICT COUNCIL

Project Title

WEST OXFORDSHIRE STRATEGIC FLOOD RISK ASSESSMENT UPDATE

Drawing Title

FLOOD RISK FROM SURFACE WATER

Drawn	Checked	Approved	Date
SEB	SL	EC	November 2016

AECOM Internal Project No.	Scale at A3
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Drawing Number	Rev
FIGURE 5E	02

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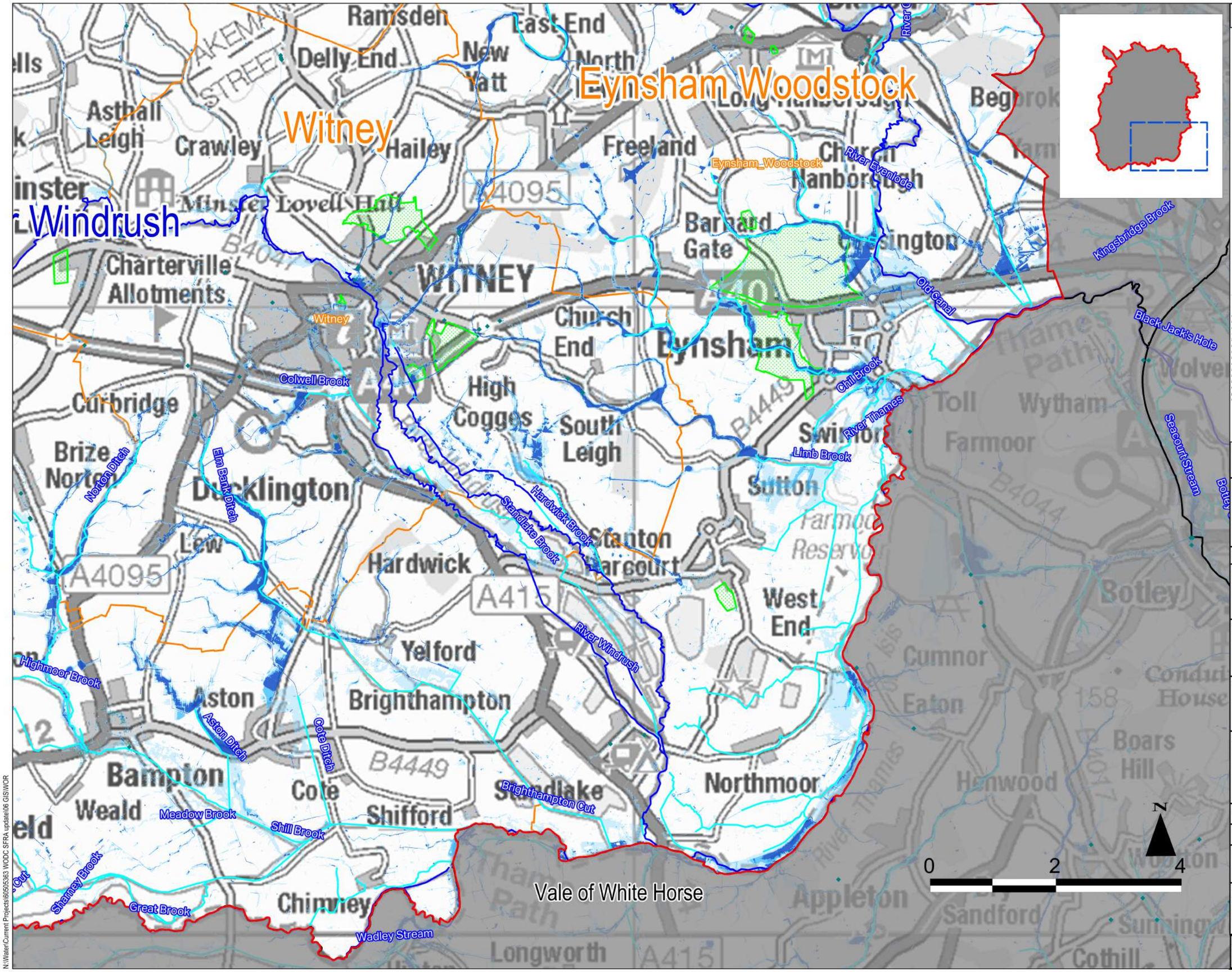

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LEGEND

- West Oxfordshire DC Boundary
- Local Planning Authorities
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Revision Details	SEB / EC	Nov 2016	Suffix

Purpose of Issue: FINAL ISSUE

Client: WEST OXFORDSHIRE DISTRICT COUNCIL

Project Title: WEST OXFORDSHIRE STRATEGIC FLOOD RISK ASSESSMENT UPDATE

Drawing Title: FLOOD RISK FROM SURFACE WATER

Drawn	Checked	Approved	Date
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AECOM Internal Project No. 60505363 | Scale at A3 1:55,000

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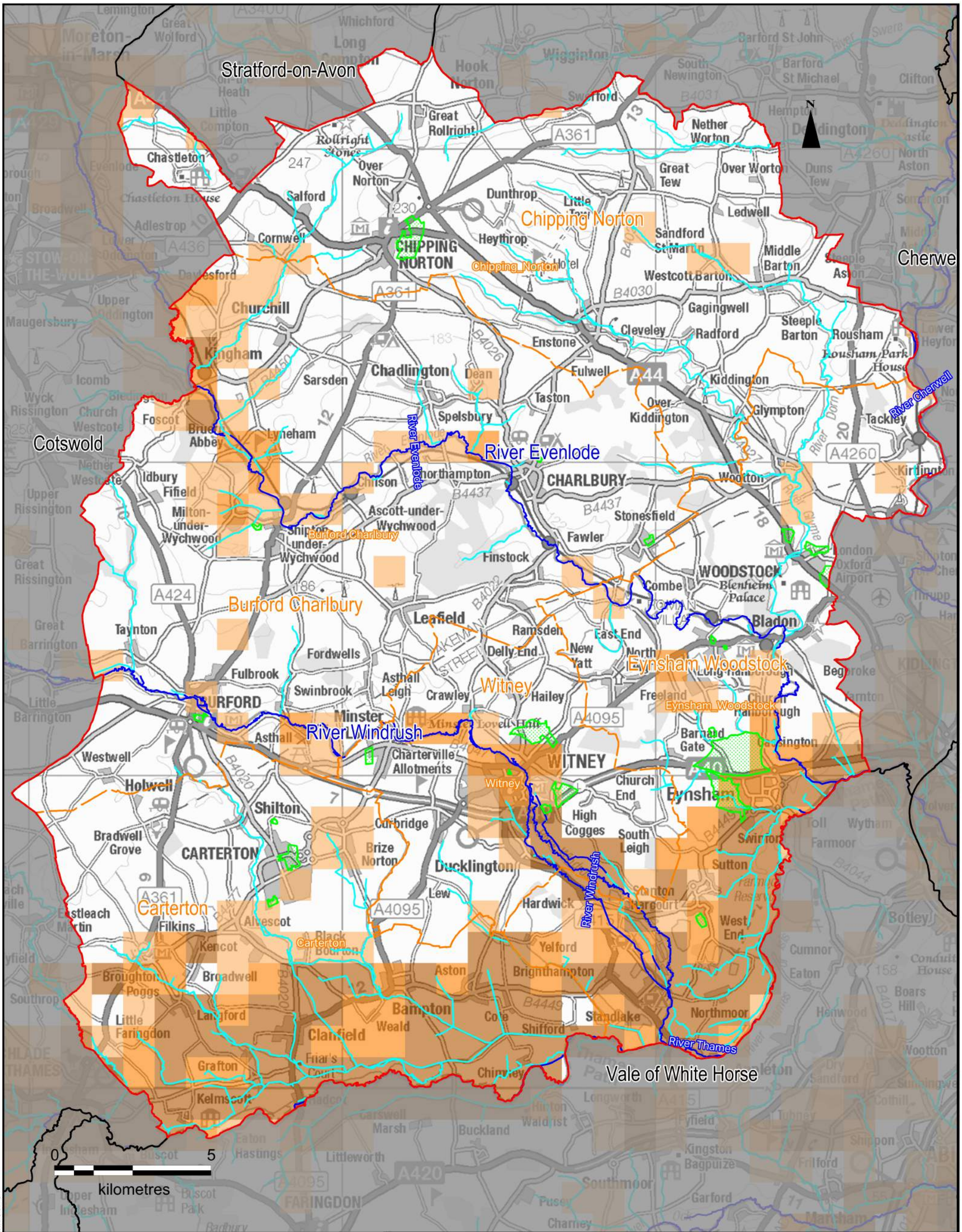

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LEGEND

- West Oxfordshire District Boundary
- LP Potential Development Sites
- West Oxfordshire Sub-boundaries
- Main Rivers
- Ordinary Watercourses

Areas Susceptible to Groundwater Flooding

< 25%	(2142)
>= 25% <50%	(594)
>= 50% <75%	(353)
>= 75%	(427)

Notes

The 1:50 000 scale digital map data is generalised and the geological interpretation should be used only as a guide to the geology at a local level, not as a site-specific geological plan based on detailed site investigations.

Intended Use

This map is intended to provide a strategic overview of susceptibility to groundwater flooding and should not be used to assess flood risk for individual properties.

Project Title: WEST OXFORDSHIRE COUNCIL STRATEGIC FLOOD RISK ASSESSMENT

AECOM Internal Project No. 60505363

Client: WEST OXFORDSHIRE DISTRICT COUNCIL

Revision Details	SEB / EC	Nov 2016	Suffix

Scale at A3: 1:110,000

Drawn: SEB | Checked: SL

Approved: EC | Date: November 2016

Purpose of Issue: FINAL ISSUE

Drawing Title: AREAS SUSCEPTIBLE TO GROUNDWATER FLOODING (ASTGWF)

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Rev: 02

Stratford-on-Avon

Cotswold

Chipping Norton

Eynsham Woodstock

Burford Charlbury

Witney

Carterton

Vale of White Horse

River Evenlode

River Windrush

0 5

kilometres

LEGEND

West Oxfordshire District Boundary

LP Potential Development Sites

Sewer Flood Incidents

20 to 25	(1)
15 to 20	(3)
10 to 15	(0)
5 to 10	(1)
1 to 5	(12)

Revision Details	SEB / EC	Nov 2016	Suffix

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

Project Title: WEST OXFORDSHIRE COUNCIL STRATEGIC FLOOD RISK ASSESSMENT

AECOM Internal Project No.: 60505363

Client: WEST OXFORDSHIRE DISTRICT COUNCIL

Scale at A3: 1:110,000

Drawn: SEB | Checked: SL

Approved: EC | Date: November 2016

Purpose of Issue: FINAL ISSUE

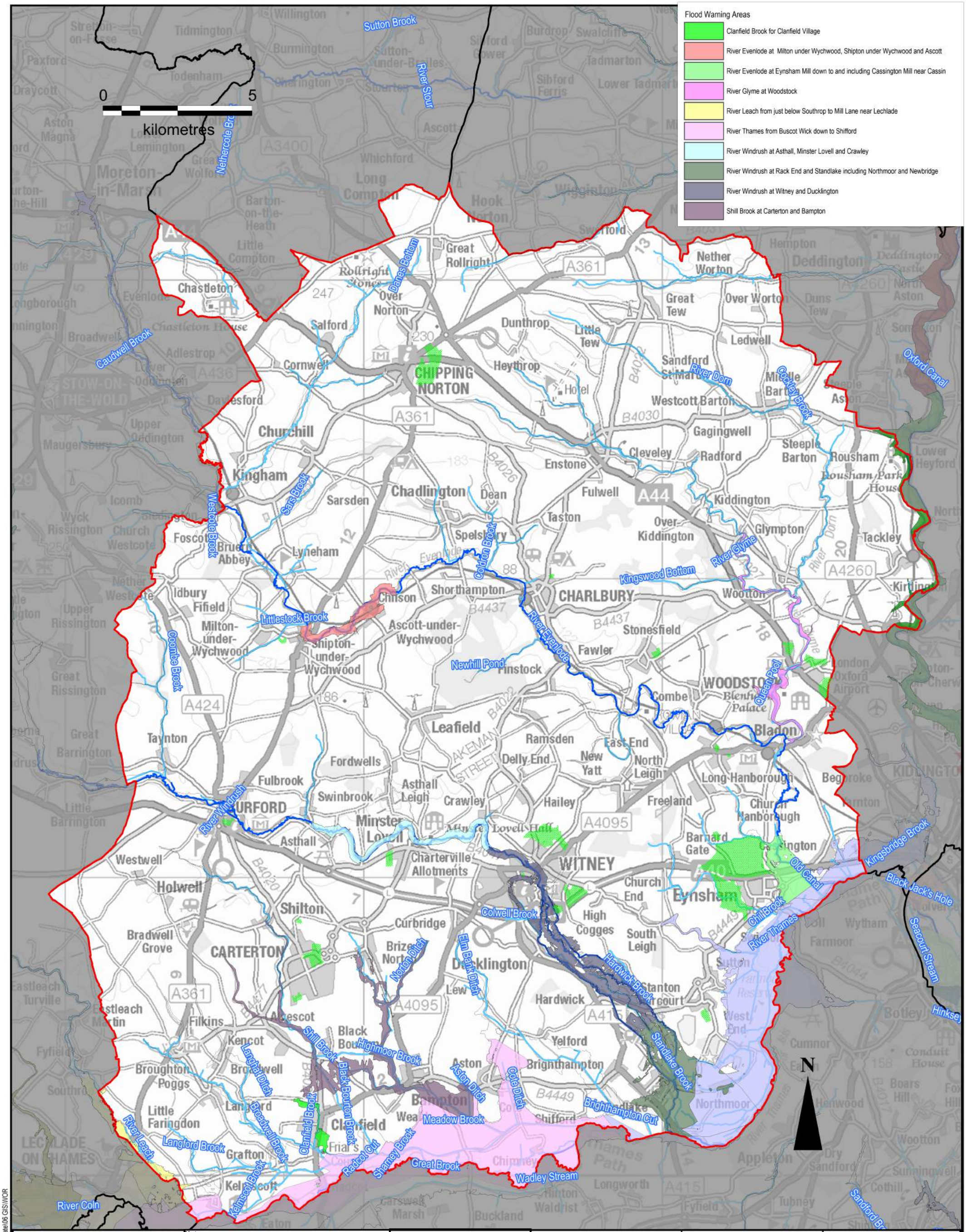
Drawing Title: HISTORICAL SEWER FLOODING INCIDENTS

AECOM
Sunley House
4 Bedford Park
Croydon
CR0 2AP
T +44-(0)-20 8639 3500

Drawing Number: FIGURE 7

Rev: 02

N:\Water\Current Projects\60505363 WODC SFRA update\06 GIS\WOR



LEGEND

- Local Planning Authority boundary
- Settlement Area boundary
- Main Rivers
- Open Ordinary Watercourses
- Local Plan Potential Development Sites

Notes

The Environment Agency provide a free flood warning service for many areas at risk of flooding from rivers and the sea. In some parts of England the Environment Agency may be able to provide warnings when flooding from groundwater is possible. The Environment Agency free flood warning service can provide advance notice of flooding and can provide time to prepare. It is found at: http://maps.environment-agency.gov.uk/

The Environment Agency issue flood warnings to homes and businesses when flooding is expected. Upon receipt of a flood warning, occupants should take immediate action.

The Environment Agency issue flood alerts when flooding is possible. Flood alerts cover larger areas than flood warnings and are issued more frequently. Upon receipt of a flood warning, occupants should be prepared for flooding and to take action.

If a flood alert for groundwater is available this does not mean that your property is definitely at risk. It is very difficult to predict the exact location of flooding from groundwater as it is often related to local geology. To help people, the Environment Agency provide flood alerts for large areas that could be affected if groundwater levels were high.

Revision Details			Suffix
	SEB / EC	Nov 2016	

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

Scale at A3:	1:115,000
Drawn	SEB
Checked	SL
Approved	EC
Date	November 2016

Purpose of Issue: FINAL ISSUE

Project Title: WEST OXFORDSHIRE COUNCIL STRATEGIC FLOOD RISK ASSESSMENT

Drawing Title: ENVIRONMENT AGENCY FLOOD WARNING AREAS

AECOM Internal Project No.: 60505363

Client: WEST OXFORDSHIRE DISTRICT COUNCIL

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Drawing Number: FIGURE 8

Rev: 02

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Appendix C Data Register and Historical Flood Records

C1 Data Register

Organisation	Dataset Description	EA Open Source	Format	Importance	Contact Name	Contact Email address	Received	Date received
WODC	Ordnance Survey Mapping (1: 10,000, 1:25,000)	No	TAB	High	Gemma Hoad	Previously obtained for the Oxfordshire 2015 SFRA	YES	11/05/2016
WODC	Post code boundary (GIS layer)	No	TAB	High	Andrew Thomson	Andrew.Thomson@westoxon.gov.uk	YES	11/05/2016
WODC	WODC administrative boundary	Administrative Boundaries - Public Face Areas	TAB	High	Andrew Thomson	Andrew.Thomson@westoxon.gov.uk	YES	11/05/2016
WODC	OS Master map	No	TAB	High	Gemma Hoad	Previously obtained for the Oxfordshire 2015 SFRA	YES	11/05/2016
WODC	Records of flooding from all sources (GIS layer, or georeferenced database)	Recorded Flood Outlines	TAB	High	Ed Byers	Open Source data 30/09/2015	YES	11/05/2016
WODC / EA / OCC	Flood Risk Information including any details of roads susceptible to flooding/closure, any details of major flood incidents / call outs etc	Flood Risk Areas - LLFAs have identified areas for SW flooding based on combing risk to people, critical services, commercial and public assets and detailed flood modelling (30/09/2015)	TAB	Moderate	Andrew Thomson	Open Source data 30/09/2015	YES	11/05/2016
WODC	Any WODC flood risk improvement schemes	No	DOC	Moderate	Gordon Hunt	Gordon.hunt@oxfordshire.gov.uk	NO	N/A

Organisation	Dataset Description	EA Open Source	Format	Importance	Contact Name	Contact Email address	Received	Date received
WODC	Emergency Rest centres (GIS layer)	No	TAB	Moderate	Gordon Hunt	Gordon.hunt@oxfordshire.gov.uk	NO	N/A
WODC	Geology data - solid and drift geology (GIS layer)	No	TAB	Moderate	Ed Byers	Open Source data 2016	YES	11/05/2016
WODC	GIS layer of proposed development site boundaries	No	TAB	High	Andrew Thomson	Andrew.Thomson@westoxon.gov.uk	YES	11/05/2016
WODC (from BGS)	BGS Susceptibility to Groundwater Flooding (GIS layer)	Real-time Flood Data Groundwater Levels - TAB - Flood Alerts API registration required	TAB	High	Flood Alerts API	Open Source data 2016	NO	N/A
WODC (from BGS)	BGS SuDS Suitability data (GIS layer)	No	TAB	Low	Gordon Hunt	Gordon.hunt@oxfordshire.gov.uk	NO	N/A
AECOM (from EA Geomatics website).	LiDAR topographic data (GIS files)	No	asc	Low	Andrew Thomson	Andrew.Thomson@westoxon.gov.uk	YES	11/05/2016
WODC (from EA Geostore)	Aquifer Designation Map (Bedrock Geology)	No	TAB	Low	Ed Byers	Open Source data 2016	YES	11/05/2016
WODC (from EA Geostore)	Aquifer Designation Map (Superficial Deposits)	No	TAB	Low	Ed Byers	Open Source data 2016	YES	11/05/2016
WODC (from EA Geostore)	Areas Susceptible to Groundwater Flooding	Real-time Flood Data Groundwater Levels - TAB - Flood Alerts API registration required	TAB	High	Gemma Hoad	Previously obtained for the Oxfordshire 2015 SFRA	YES	11/05/2016
WODC (from EA Geostore)	Detailed River Network (DRN)	No	TAB	High	Gemma Hoad	Open Source data 2016	YES	11/05/2016
WODC (from EA Geostore)	Flood Alert Areas	Flood Alert Areas	TAB	Moderate	Andrew Thomson	Open Source data 2016	YES	11/05/2016

Organisation	Dataset Description	EA Open Source	Format	Importance	Contact Name	Contact Email address	Received	Date received
WODC (from EA Geostore)	Flood Map for Planning (Rivers and Sea) (Flood Zpne 2, 3a, 3b (functional floodplain)	Flood Map for Planning (Rivers and Sea) - Flood Zone 2 and 3	TAB	High	Ed Byers	Open Source data 2016	YES	11/05/2016
WODC (from EA Geostore)	Flood Warning Areas	Flood Warning Areas (30/09/2015)	TAB	Moderate	Lauren Giddings	enquiries@environment-agency.gov.uk	YES	23/05/2016
WODC (from EA Geostore)	Historic Flood Map	Historic Flood Map (01/10/2015)	TAB	High	Ed Byers	Open Source data 2016	YES	11/05/2016
WODC (from EA Geostore)	National Receptor Database (NRD)	No	TAB	High	Andrew Thomson	Andrew.Thomson@westoxon.gov.uk	YES	11/05/2016
WODC (from EA Geostore)	Historic Flood Outlines	Historic Flood Outlines	TAB	High	Andrew Thomson	Andrew.Thomson@westoxon.gov.uk	YES	11/05/2016
WODC (from EA Geostore)	Source Protection Zones	Source Protection Zones (merged)	Tab	Low	Ed Byers	Open Source data 2016	YES	11/05/2016
WODC (from EA Geostore)	Statutory Main Rivers	Yes	TAB	High	Lauren Giddings	enquiries@environment-agency.gov.uk	YES	27/05/2016
WODC (from EA Geostore)	Updated Flood Map for Surface Water (Basic Version)	Yes	TAB	High	Gemma Hoad	Open Source data 2016	YES	11/05/2016
WODC (from EA Geostore)	Flood Defence Locations (NFCDD or AIMS)	Yes	TAB	Moderate	Andrew Thomson	Requested 11/05/2016	No	N/A
Environment Agency	Details of any upcoming flood risk management work/studies	No	TAB	Moderate	Andrew Thomson	Requested 11/05/2016	No	N/A

Organisation	Dataset Description	EA Open Source	Format	Importance	Contact Name	Contact Email address	Received	Date received
Environment Agency	Groundwater Flood Incident Records	No	TAB	Moderate	Gemma Hoad	Previously obtained for the Oxfordshire 2015 SFRA	YES	11/05/2016
Environment Agency	AIMS (Asset Information Management System) for the study area including defence standard of protection. (GIS Shapefile)	No	Excel	Medium	Lauren Giddings	laure.giddings@environment-agency.gov.uk	YES	07/07/2016
Environment Agency	Areas Benefitting from Flood Defences	Flood Map for Planning (Rivers and Sea) - Areas Benefiting from Flood Defences	TAB	High	Emily Craven/Carl Pelling	Open Source data 2016	YES	11/05/2016
Environment Agency	Historic records of flooding from all sources	Historic Flood Outlines Historic Flood Map Recorded Flood Outlines	TAB	High	Gemma Hoad	Open Source data 2016	YES	11/05/2016
Thames Water	DG5 Register for Sewer flooding reports	No	DOC	High	Mark Dickinson	Mark.Dickinson@thameswater.co.uk	YES	18/05/2016
Highways England	Records of flooding. Any locations susceptible to flooding in the district.	No	PDF	High		RIU_E@highwaysengland.co.uk	No	N/A
OCC	Records of flooding from all sources (GIS layer)	No	TAB	High	Gordon Hunt	Gordon.hunt@oxfordshire.gov.uk	YES	11/05/2016

Organisation	Dataset Description	EA Open Source	Format	Importance	Contact Name	Contact Email address	Received	Date received
OCC	Local Flood Risk Management Strategy	No	PDF	High	Gordon Hunt	Gordon.hunt@oxfordshire.gov.uk	YES	11/05/2016
OCC	Flood Incident Reports (Available online)	No	PDF	High	Gordon Hunt	Gordon.hunt@oxfordshire.gov.uk	YES	11/05/2016
OCC	PFRA and associated datasets (GIS layer)	No	PDF	High	Gordon Hunt	Gordon.hunt@oxfordshire.gov.uk	YES	11/05/2016

C.2 Historical Flood Records

Date	Location	Source	Impact	Data Source
January 1877	Windrush Catchment at Witney	Fluvial	Properties flooded	BHS
1894	Windrush Catchment at Witney	Fluvial	Properties flooded	BHS
1894	Flood water very high at Bleddington Bridge, Bledington, R. Evenlode. Water too high for crossing at Ascott-under-Wychwood, R. Evenlode Catchment & very high at Shipton-under-Wychwood	Fluvial	River crossings impassable	BHS
December 1907	Woodstock	Fluvial	Flooding of Woodstock village	BHS
November 1909	Woodstock	Fluvial	Flooding of Woodstock village – businesses affected	BHS
June 1910	Chipping Nortonand Stow-on-the-Wold, River Evenlode Catchment	Surface water flooding	Intense rainfall	BHS
March 1947	River Windrush at Witney bridge	Fluvial	80.94 mAOD recorded at the bridge	BHS
July 1947	Evenlode Catchment, River Dorn at Standford	Surface water flooding	Intense rainfall. 3.50in fell during a thunderstorm in an hour and forty-five minutes	BHS
1959	Woodstock	Surface water flooding	Intense rainfall occurred on the 9th when 1.80in of rain was recorded in 45 minutes	BHS
December 1960	Flooding of River Windrush at Witney Bridge	Fluvial	Bridge impassable	BHS
February 1990	Flooding of River Windrush at Witney Bridge	Fluvial	80.27 mAOD recorded at bridge	BHS
January 1998	Flooding of River Windrush at Witney Bridge	Fluvial	80.33 mAOD recorded at bridge	BHS
July 2007	Widescale flooding across District	Numerous sources	Numerous homes, businesses and transport links flooded. Refer to WODC Flood Defence Reports for further information.	WODC, EA, local press.

Appendix D - Settlement Area Schedules

Appendix D - Settlement Area Schedules

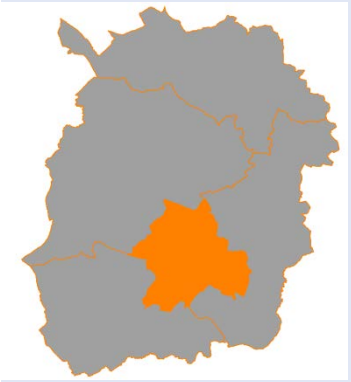
A strategic assessment of the flood risk from all sources has been undertaken for each of the five sub-areas identified in the Local Plan 2031. The District has been divided into five sub-areas for the purpose of the Local Plan, which are based on landscape characteristics and local catchment areas for key services and facilities. The sub-areas are as follows:

- Witney sub-area
- Carterton sub-area
- Chipping Norton sub-area
- Eynsham – Woodstock sub-area
- Burford – Charlbury sub-area

Across these sub-areas there are three main service centres (Witney, Carterton and Chipping Norton) six rural service centres (Burford, Bampton, Charlbury, Eynsham, Long Hanborough and Woodstock) plus a number of villages and hamlets.

The findings are presented in the following schedules.

The schedules should be read with reference to the figures in Appendix B.

Main Service Area - Witney Sub-Area		
General Information		
Area	Smallest of the 5 sub-areas covering ~7,000 hectares	
Character[1]	Witney is located in the centre of the District and is the most heavily populated of the 5 sub-areas, with 33,000 people. Witney is the District's largest town, acting as a main service centre and offering a broad range of housing, employment and services. The remainder of the sub-area comprises a number of small villages and hamlets including Crawley, Hailey, Minster Lovell, Ducklington, South Leigh and Curbridge. These smaller settlements look to Witney for the most essential services. The majority of the housing is located within Witney town (around 12,000) which has doubled in size over the past 30 years. Witney sub-area plays a crucial economic role containing just over 30% of the District's employment opportunities (15,000 jobs). There is a high level of affordable housing need with Witney being the preferred location for many on the Council's housing waiting list. Witney is a key shopping and leisure destination with scope for additional shopping provision in the medium to long-term, although parking capacity in the Town Centre is an issue at peak times. Traffic congestion is a key issue for this area both in the centre of Witney and on the A40. Witney is an environmentally sensitive sub-area with a number of local designations and a small element of the Cotswolds Area of Outstanding Natural Beauty (AONB). Relatively limited development opportunities within Witney mean that the development of Greenfield land on the edge of the town will be required to meet future needs.	
Topography	Witney Town Centre and the villages in the south of the sub-area sit in the low-lying land adjacent to the floodplain of the River Windrush at approximately 80mAOD. The land rises to the north, with the highest topography reaching around 120mAOD in the village of Hailey.	
Geology	Superficial - the Settlement Area is underlain by zones of superficial deposits – Alluvium (Clay, Silt, Sand and Gravel), Wolvercote Sand And Gravel Member, Hanborough Gravel Member, Northmoor Sand And Gravel Member, Summertown-radley Sand And Gravel Member or Northern Drift Formation (Sand and Gravel). There are also large areas where no superficial deposits are present. Bedrock - the Settlement Area is underlain by Oxford Clay Formation And West Walton Formation (undifferentiated) Mudstone, Kellaways Sand Member (Sandstone And Siltstone Interbedded), Kellaways Clay Member (Mudstone), Cornbrash Formation (Limestone), Forest Marble Formation (Limestone), White Limestone Formation and Hampen Formation (Limestone).	Figures B3 & B4
Aquifer Type	The superficial deposits in this sub-area are classified as either Secondary A aquifers, Secondary (undifferentiated) strata or Unproductive Strata. According to Environment Agency definitions, a Secondary A aquifer is defined as a permeable layer capable of supporting water supplies a local rather than strategic scale and in some cases forming an important source of base flow to rivers. Secondary Undifferentiated defines areas where the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variability of the rock Unproductive Strata are layers of rock or drift deposits with low permeability that have negligible significance for water supply or river base flow. The underlying bedrock in the northwest of the sub-area is classified as either a Principal Aquifer or a Secondary A aquifer. The southeast of the sub-area is designated Unproductive Strata. According to the Environment Agency definitions, a Principal Aquifer consists of layers of rock that have high intergranular and/or fracture permeability – meaning they provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.	-
Main Rivers	The River Windrush flows through the centre of the Witney sub-area in a south-easterly direction.	Figures B1

[1]West Oxfordshire District Council (2011) West Oxfordshire Local Plan 2031

	It flows through Witney Town Centre before splitting into three separate channels. Approximately 7km of its length is within the Witney sub-area, which falls around 20m across this reach. The River Windrush along this reach comprises of multiple sinuous channels, with the Madley Brook joining to the southeast of Witney Town Centre.	
Ordinary Watercourses	There are several ordinary watercourses that form tributaries to the River Windrush; these include Emma's Dyke, Colwell Brook, Hardwick Brook and Standlake Brook. In the southwest of the sub-area there is another ordinary watercourse called Elm Bank Ditch. These all flow in a south-easterly direction.	Figure B1
Flood Risk		
Flooding from Rivers	*Flood Zones* *Functional Floodplain* Much of the land adjacent to the River Windrush is Functional Floodplain, which is land shown to be at risk during the 5% AEP (1 in 20 year) flood event. The majority of this flood zone is rural agricultural land; however, where the Windrush flows through the town of Witney several developed areas intersect this high risk flood zone. This includes Welch Way and Ducklington Lane and the surrounding development, as well as various services in the centre of the town such as the library. The rest of Witney sub-area is mainly Flood Zone 1, which has a flood risk of less than 0.1% AEP (1 in 1000 year). Surrounding Elm Bank Ditch there are areas designated as flood Zone 3, which has a flood risk of 1% AEP (1 in 100 year); however, these areas are largely dominated by rural land. *Climate Change* Consultation with Environment Agency agreed that climate change in West Oxfordshire would be defined by the 1 in 1000 year flood event. For Witney sub-area there is only a small area of floodplain that falls within this flood zone. This is located to the south of Witney in agricultural land south of the A40. *Historic Records* Of all the sub-areas Witney holds a comparatively large number of flood records for its small size. The Environment Agency flood map highlights historic flooding along the River Windrush to the north of and within Witney Town Centre. The 2007 flood event effected parts of the A4095, A40 and Witney Town Centre. More recently there have been flood events recorded in 2012, 2013 and 2014, which included areas of the A415 and A4095. *Flood Defences* The Environment Agency AIMS dataset identifies that the River Windrush is largely undefended. There are however some smaller scale defence assets coordinated by West Oxfordshire District Council. This is includes various structures (e.g. outfalls, weirs, control gates) along Madley Brook and the River Windrush adjacent to the A4095.	Figures B2
Flooding from Land	The uFMfSW identifies a higher risk of surface water flooding in the natural topographic low points in the sub-area. Flow paths follow the natural drainage of the local area, ponding in lower lying areas adjacent to the River Windrush and adjacent to embanked A40. The data shows the areas between Mill Street and Crawley Road to be a significant risk to surface water ponding. *Historic Records* OCC have a record of previous surface water flood incidents in the Witney sub-area. There are several incidents recorded along the main highways, including the A40 and A415 and a concentrates area along Mill Street in central Witney.	Figure B5
Flooding from Groundwater	The majority of the Settlement Area is classed as low risk i.e. limited potential for groundwater flooding to occur. However, the area surrounding the River Windrush is highlighted with greater risk. Particularly to the south of Witney Town Centre where there are multiple channels of the River Windrush.	Figure B6
Flooding from Sewers	The DG5 Register identifies that during the last 10 years sewer flooding has affected 5-10 properties in the centre of the sub-area, 15 – 20 in the south, 1 to 5 is the east and less than 5 in the north.	Figure **B**7
Managing and Mitigating Flood Risk		

Flood Warning Areas	The Environment Agency Flood Warning Areas relevant to the sub-area Area are: 'River Windrush at Witney and Ducklington', 'River Windrush at Asthall, Minster Lovell and Crawley' and the 'River Thames between Newbridge and Kings Lock above Oxford'.	Figure B8
Site-specific FRA Guidance	Section 6 provides detailed guidance on measures to manage and mitigate flood risk, and Section 7 provides guidance on preparation of site-specific FRAs.	Section 6 & 7
Policy Recommendations	Section 8 provides spatial planning and development control recommendations for the District.	Section 8

Main Service Area - Carterton Sub-Area		
General Information		
Area	Carterton sub-area is the second smallest of the five sub-areas covering just 13,000 hectares.	
Character[1]	Regardless of its size Carterton sub-area is well-populated containing around 25,000 people, the majority of which live in Carterton town (16,000). Carterton is a relatively new town that has expanded over the past 100 years from an area of small dwellings to become the second largest in West Oxfordshire. It is a relatively less expensive area compared to other parts of the District; however, there is still a high demand for affordable housing. There is currently an imbalance of more workers to jobs leading to out-commuting. There is also a lack of related leisure services, including bars, shops and restaurants; however, the Town Centre has the physical capacity to accommodate a range of new uses. Carterton is relatively remote and can be accessed by 'B' roads only. It is an environmentally sensitive area including the presence of sand and gravel resources and flood risk. The Country Park is a key local asset and has the potential to be expanded. There are a number of identified infrastructure needs for Carterton including additional playing fields, allotments, a cemetery and fire station.	
Topography	The southern edge of the sub-area is low lying land adjacent to the floodplain of the River Thames (~70mAOD). The land rises towards the north where reaches about 110mAOD in Shilton.	
Geology	Superficial - the Settlement Area is underlain by zones of superficial deposits – either Alluvium (Clay, Silt, Sand and Gravel), Wolvercote Sand And Gravel Member, Hanborough Gravel Member, Northmoor Sand And Gravel Member, Summertown-radley Sand And Gravel Member or Northern Drift Formation (Sand and Gravel). There are also large areas where no superficial deposits are present. Bedrock - the Settlement Area is underlain by Oxford Clay Formation And West Walton Formation (undifferentiated) Mudstone, Kellaways Sand Member (Sandstone And Siltstone Interbedded), Kellaways Clay Member (Mudstone), Cornbrash Formation (Limestone), Forest Marble Formation (Limestone), White Limestone Formation and Hampen Formation (Limestone).	Figures B3 & B4
Aquifer Type	The superficial deposits in this sub-area are classified as either Secondary A aquifers, Secondary (undifferentiated) strata or Unproductive Strata. According to Environment Agency definitions, a Secondary A aquifer is defined as a permeable layer capable of supporting water supplies at a local rather than strategic scale and in some cases forming an important source of base flow to rivers. Secondary Undifferentiated defines areas where the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variability of the rock Unproductive Strata are layers of rock or drift deposits with low permeability that have negligible significance for water supply or river base flow. The underlying bedrock in the northwest of the sub-area is classified as either a Principal Aquifer or a Secondary A aquifer. The southeast of the sub-area is designated Unproductive Strata. According to the Environment Agency definitions, a Principal Aquifer consists of layers of rock that have high intergranular and/or fracture permeability – meaning they provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.	-
Main Rivers	The River Thames borders the southern edge of the Carterton sub-area and flows in an easterly direction. There are only very small reaches of the River Thames that are technically within the Carterton sub-area, however, the sub-area is still affected by the flood risk from this river.	Figure B1
Ordinary Watercourses	There are comparatively many more ordinary watercourses in the Carterton sub-catchment, with the main ones being Shill Brook, Langford Brook, Broadwell Brook, Highmoor Brook and Clanfield Brook. These flow in a southerly direction towards the River Thames.	Figure B1

Main Service Area - Carterton Sub-Area		
Flood Risk		
Flooding from Rivers	*Flood Zones* *Functional Floodplain* There are large areas of Functional Floodplain in the south of Carterton sub-area adjacent to the River Thames. This is land classified as having a flood risk of 5% AEP (1 in 20 year). The extent of this flood zone extends as far as Bampton and Clanfield, however, the land inundated is largely rural and agricultural in nature. Surrounding the ordinary watercourses in the central part of the sub-area there are areas of Flood Zone 3, where the land has a flood risk of 1% AEP (1in 100 year) or greater in any given year. The rest of the sub-area is at low flood risk and classified as Flood Zone 1. *Climate Change* Consultation with Environment Agency agreed that climate change in West Oxfordshire would be defined by the 1 in 1000 year flood event. For the Carterton sub-area there are areas that fall within this flood zone in Grafton, Clanfield Bampton and Shifford. *Historic Records* There are several flood records in Carterton sub-area dating to the 2007 flood event. These are mainly located in Bampton, Broughton Poggs and Carterton town. The Environment Agency's historic flood map shows extensive areas of historic flooding associated with the River Thames in the south of the sub-area. *Flood Defences* The Environment Agency AIMS dataset identifies that the River Thames at this location is largely undefended. There are, however, some smaller scale defence assets coordinated by West Oxfordshire District Council. This is includes various structures (e.g. outfalls, weirs, control gates) along Shill Brook and Clanfield Brook.	Figures B2
Flooding from Land	The uFMfSW identifies a higher risk of surface water flooding in the natural topographic low points in the sub-area. Flow paths follow the natural drainage of the local area, ponding in lower lying areas adjacent to ordinary watercourses. The data shows that there are three major flow pathways in this sub-area, one that flows southward toward Bampton associated with Highmoor Brook, a short but high risk flow path flowing towards Aston associated with Aston Ditch and flowpath that is limited by Aston Road, flowing from the neighbouring Witney sub-area. *Historic Records* There are comparatively few records held by OCC of any past surface water flood incidents, with a few in Carterton along Station road, two in Shilton on the cross-junction of the Bridge Street and the B4020, and one in the centre of Bampton.	Figures B5
Flooding from Groundwater	The southern half of the Carterton sub-area is dominated by high groundwater flood risk, where there is a 75%+ chance of groundwater flooding. This is associated with the low lying areas of the Thames floodplain. Comparatively, the northern half of the Carterton sub-area has low groundwater flood risk, where there is a less than 25% chance of groundwater flooding.	Figure B6
Flooding from Sewers	The DG5 Register identifies that during the last 10 years sewer f flooding has affected between 1-5 properties in the east of the Carterton sub-area, 15-20 in the north, 20-25 in the west and none in the southwest.	Figure B7
Managing and Mitigating Flood Risk		
Flood Warning Areas	The Environment Agency Flood Warning Areas relevant to the Settlement Area are: 'Shrill Brook at Carterton and Bampton' and 'River Thames from Buscot Wick down to Shifford'.	Figure B8
Site-specific FRA Guidance	Section 6 provides detailed guidance on measures to manage and mitigate flood risk, and Section 7 provides guidance on preparation of site-specific FRAs.	Section 6 & 7
Policy Recommendations	Section 8 provides spatial planning and development control recommendations for the District.	Section 8

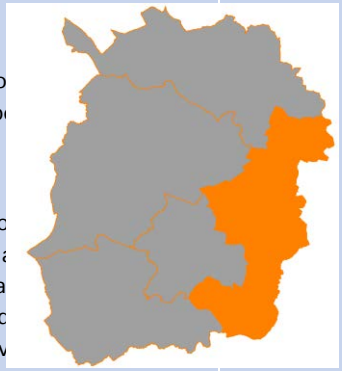
Main Service Area - Chipping Norton Sub-Area		
General Information		
Area	The second largest of the five sub-areas covering just over 15,000 hectares	
Character[1]	The population is comparatively low for its size with just 13,000 residents half of which live in the hilltop town of Chipping North. Chipping Norton is the third largest town in West Oxfordshire and occupies a more prominent hill-top position on the eastern edge of the Cotswold Area of Outstanding Natural Beauty (AONB). The surrounding villages look to Chipping Norton which acts as a service centre although Chipping Norton itself looks to Banbury for higher order services and facilities. Chipping Norton is generally known as a 'working town' but the number of people living and working in the town has fallen from 50% to 36% since 2001. There is very limited business land available to meet future needs. Chipping Norton as a main service centre offers a good range of services and facilities but a number of infrastructure requirements have been identified including additional primary school capacity, affordable housing, library provision and additional public car parking. There is some potential for the utilisation of previously developed land within the town but not enough to meet future housing requirements and as such an urban extension will be needed.	
Topography	Chipping North is one of the highest settlements of its size in the south of England reaching 185mAOD. The sub-area slopes downward to the east towards Middle Barton, where topography is at approximately 130mAOD.	
Geology	Superficial – the sub-area has comparatively fewer underlying superficial deposits. There is some Alluvium (Clay, Silt, Sand and Gravel), Peat and River Terrace Deposits (Sand and Gravel) to the west of the sub-area associated with Danes Brook. The rest of the sub-area has no superficial deposits recorded, apart from a few patches of Alluvium. Bedrock - the Settlement Area is underlain by the Great Oolite Group (Sandstone, Limestone And Argillaceous Rocks), Lias Group (Mudstone, Siltstone, Limestone And Sandstone) and Inferior Oolite Group (Limestone, Sandstone, Siltstone And Mudstone).	Figures B3 & B4
Aquifer Type	Due to the sparsity of superficial deposits in Chipping Norton sub-area there only a very small area of Secondary Undifferentiated) strata in the north of the sub-area. There are three categories of aquifer for the underlying bedrock: Principal, Secondary A and Secondary (Undifferentiated). A Principal Aquifers are layers of rock or drift deposits that have high intergranular and/or fracture permeability meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. Secondary A aquifers are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.	-
Main Rivers	There are no main rivers in the Chipping Norton sub-area; however, several ordinary watercourses exist.	Figure B1
Ordinary Watercourses	Due to the high topography in this sub-area, Chipping Norton is dominated by several ordinary courses which flow south to join the River Evenlode in Kingham and Bladon. The ordinary watercourses include: Danes Bottom, River Dorn, Cockley Brook and the River Glyme. These are all modest highland watercourses, with the largest being the River Glyme which accumulates runoff from the centre of the sub-area before joining Queen Pool in the neighbouring sub-area of Eynsham Woodstock.	Figure B1
Flood Risk		
Flooding from Rivers	*Flood Zones* *Functional Floodplain* Due to the absence of any Main Rivers in the sub-area and the small confined floodplains of the	Figure B2

Main Service Area - Chipping Norton Sub-Area		
	ordinary watercourses, there is no Function Floodplain within the Chipping Norton sub-area. There are small areas of Flood Zone 3 (1% AEP) associated with the ordinary watercourses. These are mostly in rural areas aside where the River Glyme intersects Enstone and the Cockley Brook intersects Middle Barton. *Climate Change* The data shows confined areas of Flood Zone 2 (representing climate change) associated with Danes Bottom in Cornwell. *Historic Records* There are very few historic flood records in the Chipping Norton sub-area. The only exceptions to this are: flooding in Salford in 2007, flooding in Chipping Norton Town and Middle Barton in 2012 and flooding in Enstone and Over Worton in 2014. *Flood Defences* There are no recorded flood assets in this sub-area.	
Flooding from Land	The uFMfSW identifies a higher risk of surface water flooding in the natural topographic low points in the sub-area. Flow paths follow the natural drainage of the local area, ponding in lower lying areas adjacent to the ordinary watercourses. The data shows a prominent flowpath extending from Little Rollright towards Churchill to the West of Chipping Norton Town Centre. There is also a surface water flow pathway flowing toward Middle Barton associated with the River Dorn. *Historic Records* Similarly there are very few historic records of surface water flooding in the sub-area. The only exception to this is in Enstone and Middle Barton, where there have been a small number of floods reported.	Figure B5
Flooding from Groundwater	Virtually the entire sub-area has a low risk of groundwater flooding with <25% susceptibility to groundwater flooding, however, there is a small area that has slightly elevated risk (25-50%) in Westcott Barton and Cornwell.	Figure B6
Flooding from Sewers	The DG5 Register identifies that during the last 10 years sewer flooding has affected between 1-5 properties in the sub-area.	Figure B7
Managing and Mitigating Flood Risk		
Flood Warning Areas	Due to the low level of flood risk in the sub-area there are no Environment Agency Flood Warning Areas.	Figure B8
Site-specific FRA Guidance	Section 6 provides detailed guidance on measures to manage and mitigate flood risk, and Section 7 provides guidance on preparation of site-specific FRAs.	Section 6 & 7
Policy Recommendations	Section 8 provides spatial planning and development control recommendations for the District.	Section 8

Rural Service Centre – Eynsham – Woodstock Sub-Area		
General Information		
Area	Third largest sub-area covering around 14,000 hectares	
Character[1]	Eynsham – Woodstock sub-area accommodates a population of around 21,000 people. The three main settlements are Eynsham, Long Hanborough and Woodstock. With a population of 5,000 Eynsham is the fourth largest settlement in West Oxfordshire, located just south of the A40, half way between Oxford and Witney and just beyond the western edge of the Oxford Green Belt. House prices in this sub-area are some of the highest in the District. This area is an important source of employment providing around 25% of the District's total number of job opportunities. Eynsham in particular is an important location for business. There are strong links with Oxford, with a high proportion of residents working in the city and much of the economic activity forming part of the wider Oxford city region economy. This sub-area is environmentally sensitive including the Blenheim Palace World Heritage Site, AONB, Green Belt, mineral consultation area and part of a special area of conservation (SAC). There is potential for further development primarily at the rural service centres of Eynsham and Woodstock.	
Topography	The topography is predominantly low lying valley floor in the south of the sub-area typically around 70mAOD. The north of the sub-area is more variable. The gradient begins to increase around North Leigh reaching a peak of approximately 120mAOD around Tackley.	
Geology	There are three superficial deposits in the sub-area which are: Alluvium (Clay, Silt And Sand), River Terrace Deposits (undifferentiated) (Sand And Gravel) and Glacial Sand And Gravel. The underlying bedrock comprises Great Oolite Group (Sandstone, Limestone And Argillaceous Rocks) in the north, and Kellaways Formation And Oxford Clay Formation (undifferentiated) (Mudstone, Siltstone And Sandstone) in the south.	Figure B3 & B4
Aquifer Type	The superficial deposits are almost entirely classified as Secondary A Aquifers with a very small area of Secondary (Undifferentiated) to the south of Woodstock. Secondary A Aquifers are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. Secondary (Undifferentiated) are areas with viable characteristics of rock type, making it difficult to assign them to a category.	
Main Rivers	The River Evenlode flows through the centre of the sub-area in a south-easterly direction. It falls approximately 60m over 8km, entering via Combe and leaving the sub-area through Cassington. The River Windrush cuts through the southernmost part of the sub-area, where two tributaries join to form one channel before meeting the River Thames which borders the southern edge of the sub-area. The reach of the River Windrush within this sub-area is only a couple of kilometres long.	Figure B1
Ordinary Watercourses	There are numerous ordinary watercourses in the sub-area. The River Dorm flows south from the north of the sub-area to join Queen Pool, which is a tributary of the River Evenlode. Old Canal, Chil Brook and Brighthampton Cut are all small tributaries of the River Thames. There are two ordinary watercourses associated with the Windrush: Hardwich Brook and Standlake Brook.	Figure B1
Flood Risk		
Flooding from Rivers	*Flood Zones* *Functional Floodplain* There are significant areas designated as Functional Floodplain in the south of the sub-area associated with confluence of the River Windrush and the River Thames. This is land at risk of flooding from a 5% AEP (1 in 20 year) flood event. This flood zone intersects the settlements of Northmoor, West End and Swinford. Furthermore there is a smaller localised area of Functional Floodplain along Chil Brook.	Figure B2

	The northern half of the sub-area contains Flood Zones 2 and 3 associated with the River Evenlode, Dorn and Queen Pool. These flood zones are relatively confined to their watercourses, with the exception of an area of Flood Zone 3 where the Evenlode and Thames confluence at Cassington. This is land at risk of flooding from the 1% AEP (1 in 100 year) or greater flood event. *Climate Change* Climate change is indicated by the 1 in 1000 year event (Flood Zone 2) and the data shows a large area of this flood zone surrounding the Windrush-Thames confluence. This floods extensive areas of farmland surrounding the settlements of Standlake, Stanton Harcourt and Northmoor which sit at slightly higher topography outside of the floodplain, forming Dry Islands. *Historic Records* There are several records held of flooding in 2007, mainly at the confluence of the River Windrush and Thames in Standlake. There are also records of flooding in 2007 held in Stanton Harcourt, Woodstock and North Leigh. There are also recorded flood incidents from flooding in 2012, 2013 and 2014 in Bladon and West End. There appears to be no records of flooding in the north of the sub-area *Flood Defences* The Environment Agency AIMS dataset identifies that there are no significant flood defences along the River Evenlode, Windrush and Thames at this point. There are some food assets held by WODC at the confluence of the Windrush and Thames in the form of weirs and outfalls. There are also small flood assets in Cassington along the River Evenlode, such as control gates. Chil Brook also has several assets (e.g. outfalls). Furthermore, in the north of the sub-area there are some flood assets along Slape Bottom, the River Dorn and River Glyme.	
Flooding from Land	The uFMfSW identifies a higher risk of surface water flooding in the natural topographic low points in the sub-area. Flow paths follow the natural drainage of the local area, ponding in lower lying areas adjacent to the watercourses. The data shows three major flow pathways in the southern half of the sub-area. One to the west of Cassington, another winds round to the south of Eynsham and the other flows through South Leigh and ponds deeply due to the embanked B4449. All three pathways flow in a south-easterly direction. *Historic Records* Despite the high risk areas shown in the data there are relatively few reported surface water flood incidents. The exceptions being a cluster at Hanborough on the B4449 and a few incidents in Standlake in the south of the sub-area.	Figure B5
Flooding from Groundwater	Flood risk from ground water is low in the north of the sub-area with mostly >25% susceptibility. However, the south is dominated by high susceptibility (75%+) where the land is a natural low-lying valley bottom.	Figure B6
Flooding from Sewers	The DG5 Register identifies that during the last 10 years the majority of the sub-area has experienced only 1-5 sewer flood incidents. In the southernmost point of the sub-area there are 15-20 recorded sewer flood incidents.	Figure B7
Managing and Mitigating Flood Risk		
Flood Warning Areas	The Environment Agency Flood Warning Areas relevant to the Settlement Area are: 'River Glyme at Woodstock', 'River Evenlode at Eynsham Mill down to and including Cassington Mill near Cassington', 'River Thames between Newbridge and Kings Lock above Oxford', 'River Windrush at Witney and Ducklington' and 'River Windrush at Rack End and Standlake including Northmoor and Newbridge'.	Figure B8
Site-specific FRA Guidance	Section 6 provides detailed guidance on measures to manage and mitigate flood risk, and Section 7 provides guidance on preparation of site-specific FRAs.	Section 6 & 7
Policy Recommendations	Section 9 provides spatial planning and development control recommendations for the District.	Section 9

Rural Service Centre – Burford – Charlbury Sub-Area		
General Information		
Area	This is the largest of the sub-areas covering an area of almost 22,000 hectares.	
Character[1]	It has predominantly rural character and is relatively sparsely populated with just 13,000 residents. The area includes a network of small and medium sized towns and villages, none larger than 3,000 residents. The vast majority of the area is within the Cotswolds Area of Outstanding Natural Beauty (AONB) and many of the towns and villages have extensive conservation areas and numerous listed buildings. There are two designated service centres including Burford and Charlbury. Burford whilst relatively small in population offers a good range of services and facilities and is a vitally important tourist destination for West Oxfordshire. There has been relatively little past housing delivery compared to other parts of the District, reflecting the environmentally sensitive nature of the area and poor connectivity of some parts. There are very limited opportunities for significant housing development in this area. This is an important area in terms of employment with a large proportion of people employed in professional and managerial positions and accommodating 12.5% of the District's job opportunities.	
Topography	The Burford-Charlbury sub-area has quite mixed topography due to river incision. The settlements of Charlbury, Chadlington and Kingham sit in the foothills along the north eastern side of the sub-area at around 120mAOD-130mAOD. The central area is lower lying valley floor at approximately 110mAOD in Shipton-under-Wychwood. In the south there is rise in topography at Leafield before lowering again at Burford.	
Geology	Superficial - the sub-area is underlain by superficial deposits in some areas – this includes Alluvium (Clay, Silt And Sand), River Terrace Deposits (undifferentiated) (Sand And Gravel) and Glacial Sand and Gravel at Burford, Charlbury and Kingham, plus Till (Diamicton) south of Kingham. Bedrock – the underlying bedrock consists of Great Oolite Group (Sandstone, Limestone And Argillaceous Rocks), Lias Group (Mudstone, Siltstone, Limestone And Sandstone) and Inferior Oolite Group (Limestone, Sandstone, Siltstone And Mudstone).	Figures B3 & B4
Aquifer Type	The superficial deposits in the sub-area have been designated mostly as Secondary A Aquifers with small areas of Secondary (Undifferentiated). Secondary A Aquifers are defined as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. Secondary (Undifferentiated) means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.	-
Main Rivers	The River Evenlode cuts from west to east through the centre of the sub-area. This stretch of the Evenlode is approximately 13km in length and falls around 25m.It passed through the settlements of Shipton-under-Wychwood and Charlbury. In the south of the sub-area the River Windrush flows parallel to the Evenlode. This stretch is approximately 7km long and falls around 15m. It flows through the settlement of Burford.	Figure B1
Ordinary Watercourses	There are several ordinary watercourses including Sill Brook in the south, Hazelford Brook and Coombe Brook which are both tributaries of the River Windrush, Westcote Brook, Sars Brook, Littlestock Brook Coldron Brook and Newhill Pond which are all tributaries of the River Evenlode. Finally, Kingswood Bottom in the north of the sub-area.	Figure B1
Flood Risk		
Flooding from Rivers	*Flood Zones* *Functional Floodplain* There is a small area of Functional Floodplain along the River Windrush in the south of the sub-area in Minster Lovell. In the north, there is more extensive Functional Floodplain associated with the River Evenlode at Shipton-under-Wychwood and its tributaries flowing from Milton-under-	Figure B2

Rural Service Centre – Eynsham – Woodstock Sub-Area		
General Information		
	Wychwood. This is land with a flood risk of 5% AEP (1 in 20 year) chance of flooding in any given year. Flood Zone 3 (1% AEP 1 in 100 year flood event) is somewhat more extensive than the Functional Floodplain and surroundings the entire length of the Windrush and Evenlode and their tributaries in this sub-area. Bruern Abbey and Chilson are within the wider extents of this floodplain. *Climate Change* Similarly, Flood Zone 2 (0.1% 1 in 1000year flood event) which has been used change follows the route of the Main Rivers and ordinary watercourses, ho more extensive in areas, in particular south of Chilson, where there have b incidents recorded from the 2007 flood event. *Historic Records* There are numerous flood incident reports from the 2007 flood event in Shipto where the River Evenlode meanders through the settlement. There is a sm incident reports from the 2007 flood event also in Burford. There are severa from the 2012 flood event again in Burford and also Milton-under-Wychwoo are several recorded flood incidents in Charlbury from the 2014 flood ev highways, with a couple in Burford. *Flood Defences* The Environment Agency AIMS dataset identifies that the River Windrush and Evenlode in this sub-area are largely undefended. However, the WODC flood asset database highlights that there are several defence structures along the Windrush in Burford and the surrounding area (e.g. weirs). Furthermore there are several assets along the Evenlode in Shipton-under-Wychwood and Charlbury, such as, outfalls, weirs and embankments.	
Flooding from Land	The uFMfSW identifies a higher risk of surface water flooding in the natural topographic low points in the sub-area. Flow paths follow the natural drainage of the local area, ponding in lower lying areas adjacent to the River Evenlode and some of its major tributaries. The data shows that the area around the confluence of Caudwell Brook, Sars Brook and Westcote Brook is at particularly high risk of surface water ponding. These major flow pathways cut through The Green and Bledington to the northwest of Kingham. There is also significant risk in Shipton surrounding the river floodplain at the confluence of Littlestock Brook and the Evenlode. *Historic Records* OCC hold surface water flood records in Burford, Leafield, Milton-under-Wychwood and Charlbury. These flood events have almost all occurred along roads and highways where water accumulates at low points on the impermeable surface.	Figure B5
Flooding from Groundwater	The sub-area is mainly at low risk (>25% susceptible) to groundwater flooding, however, surrounding the River Windrush between Bruern Abbey and Shipton-under-Wychwood there is elevated risk.	Figure B6
Flooding from Sewers	The DG5 Register identifies that during the last 10 years sewer flooding has affected 15-20 properties from the northwest, 1-5 in the southwest and far east and none recorded in the centre of the sub-area.	Figure B7
Managing and Mitigating Flood Risk		
Flood Warning Areas	The Environment Agency Flood Warning Areas relevant to the Settlement Area are: 'River Evenlode at Milton under Wychwood, Shipton under Wychwood and Ascott' and 'River Windrush at Asthall, Minster Lovell and Crawley'.	Figure B8
Site-specific FRA Guidance	Section 6 provides detailed guidance on measures to manage and mitigate flood risk, and Section 7 provides guidance on preparation of site-specific FRAs.	Section 6 & 7
Policy Recommendations	Section 8/9 provides spatial planning and development control recommendations for the District.	Section 8/9
	Northmoor, West End and Swinford. Furthermore there is a smaller localised area of Functional Floodplain along Chil Brook.	

	The northern half of the sub-area contains Flood Zones 2 and 3 associated with the River Evenlode, Dorn and Queen Pool. These flood zones are relatively confined to their watercourses, with the exception of an area of Flood Zone 3 where the Evenlode and Thames confluence at Cassington. This is land at risk of flooding from the 1% AEP (1 in 100 year) or greater flood event. *Climate Change* Climate change is indicated by the 1 in 1000 year event (Flood Zone 2) and the data shows a large area of this flood zone surrounding the Windrush-Thames confluence. This floods extensive areas of farmland surrounding the settlements of Standlake, Stanton Harcourt and Northmoor which sit at slightly higher topography outside of the floodplain, forming Dry Islands. *Historic Records* There are several records held of flooding in 2007, mainly at the confluence of the River Windrush and Thames in Standlake. There are also records of flooding in 2007 held in Stanton Harcourt, Woodstock and North Leigh. There are also recorded flood incidents from flooding in 2012, 2013 and 2014 in Bladon and West End. There appears to be no records of flooding in the north of the sub-area *Flood Defences* The Environment Agency AIMS dataset identifies that there are no significant flood defences along the River Evenlode, Windrush and Thames at this point. There are some food assets held by WODC at the confluence of the Windrush and Thames in the form of weirs and outfalls. There are also small flood assets in Cassington along the River Evenlode, such as control gates. Chil Brook also has several assets (e.g. outfalls). Furthermore, in the north of the sub-area there are some flood assets along Slape Bottom, the River Dorn and River Glyme.	
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Topography	The Burford-Charlbury sub-area has quite mixed topography due to river incision. The settlements of Charlbury, Chadlington and Kingham sit in the foothills along the north eastern side of the sub-area at around 120mAOD-130mAOD. The central area is lower lying valley floor at approximately 110mAOD in Shipton-under-Wychwood. In the south there is rise in topography at Leafield before lowering again at Burford.	
Geology	Superficial - the sub-area is underlain by superficial deposits in some areas – this includes Alluvium (Clay, Silt And Sand), River Terrace Deposits (undifferentiated) (Sand And Gravel) and Glacial Sand and Gravel at Burford, Charlbury and Kingham, plus Till (Diamicton) south of Kingham. Bedrock – the underlying bedrock consists of Great Oolite Group (Sandstone, Limestone And Argillaceous Rocks), Lias Group (Mudstone, Siltstone, Limestone And Sandstone) and Inferior Oolite Group (Limestone, Sandstone, Siltstone And Mudstone).	Figures B3 & B4
Aquifer Type	The superficial deposits in the sub-area have been designated mostly as Secondary A Aquifers with small areas of Secondary (Undifferentiated). Secondary A Aquifers are defined as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. Secondary (Undifferentiated) means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.	-
Main Rivers	The River Evenlode cuts from west to east through the centre of the sub-area. This stretch of the Evenlode is approximately 13km in length and falls around 25m.It passed through the settlements of Shipton-under-Wychwood and Charlbury. In the south of the sub-area the River Windrush flows parallel to the Evenlode. This stretch is approximately 7km long and falls around 15m. It flows through the settlement of Burford.	Figure B1
Ordinary Watercourses	There are several ordinary watercourses including Sill Brook in the south, Hazelford Brook and Coombe Brook which are both tributaries of the River Windrush, Westcote Brook, Sars Brook, Littlestock Brook Coldron Brook and Newhill Pond which are all tributaries of the River Evenlode. Finally, Kingswood Bottom in the north of the sub-area.	Figure B1
Flood Risk		
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	Wychwood. This is land with a flood risk of 5% AEP (1 in 20 year) chance of flooding in any given year. Flood Zone 3 (1% AEP 1 in 100 year flood event) is somewhat more extensive than the Functional Floodplain and surroundings the entire length of the Windrush and Evenlode and their tributaries in this sub-area. Bruern Abbey and Chilson are within the wider extents of this floodplain. *Climate Change* Similarly, Flood Zone 2 (0.1% 1 in 1000year flood event) which has been used to represent climate change follows the route of the Main Rivers and ordinary watercourses, however, is somewhat more extensive in areas, in particular south of Chilson, where there have been numerous flood incidents recorded from the 2007 flood event. *Historic Records* There are numerous flood incident reports from the 2007 flood event in Shipton-under-Wychwood where the River Evenlode meanders through the settlement. There is a smaller cluster of flood incident reports from the 2007 flood event also in Burford. There are several recorded incidents from the 2012 flood event again in Burford and also Milton-under-Wychwood and Leafield. There are several recorded flood incidents in Charlbury from the 2014 flood event along the main highways, with a couple in Burford. *Flood Defences* The Environment Agency AIMS dataset identifies that the River Windrush and Evenlode in this sub-area are largely undefended. However, the WODC flood asset database highlights that there are several defence structures along the Windrush in Burford and the surrounding area (e.g. weirs). Furthermore there are several assets along the Evenlode in Shipton-under-Wychwood and Charlbury, such as, outfalls, weirs and embankments.	
Flooding from Land	The uFMfSW identifies a higher risk of surface water flooding in the natural topographic low points in the sub-area. Flow paths follow the natural drainage of the local area, ponding in lower lying areas adjacent to the River Evenlode and some of its major tributaries. The data shows that the area around the confluence of Caudwell Brook, Sars Brook and Westcote Brook is at particularly high risk of surface water ponding. These major flow pathways cut through The Green and Bledington to the northwest of Kingham. There is also significant risk in Shipton surrounding the river floodplain at the confluence of Littlestock Brook and the Evenlode. *Historic Records* OCC hold surface water flood records in Burford, Leafield, Milton-under-Wychwood and Charlbury. These flood events have almost all occurred along roads and highways where water accumulates at low points on the impermeable surface.	Figure B5
Flooding from Groundwater	The sub-area is mainly at low risk (>25% susceptible) to groundwater flooding, however, surrounding the River Windrush between Bruern Abbey and Shipton-under-Wychwood there is elevated risk.	Figure B6
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Policy Recommendations	Section 8/9 provides spatial planning and development control recommendations for the District.	Section 8/9

Appendix E Sustainability Appraisal

In order to inform the exception test, reference needs to be made to the WODC Sustainability Appraisal. It is suggested that reference be made to a 'live' document rather than including a report at this point – awaiting advice from WODC on best approach.

WEST OXFORDSHIRE
DISTRICT COUNCIL

West Oxfordshire
Local Development Framework

Sustainability Appraisal Scoping Report

Updated December 2009

West Oxfordshire District Council February 2015

Pre-Submission Draft Local Plan Sustainability Appraisal Non-Technical Summary

Contents

Section One: Introduction

The West Oxfordshire Local Plan 2011-2031

1.1 West Oxfordshire District Council is preparing a Local Plan to guide future development in the Local Authority area. The Local Plan will set out an overall strategy to guide development across the District in the period up to 2031.

1.2 The Local Plan is likely to be subject to an early review to take account of unmet housing need arising from Oxford City. This will also provide the opportunity to address smaller housing sites including provision for travelling communities.

The Sustainability Appraisal Report

1.4 This document is a non-technical summary of the full Sustainability Appraisal (SA) report, which has been prepared to support and inform the proposed submission Local Plan.

1.5 A Sustainability Appraisal (SA) of the Local Plan is required under the section 19 (5) of the Planning and Compulsory Purchase Act (2004) and the National Planning Policy Framework (2012). In accordance with best practice, the SA report incorporates the requirements of the European Strategic Environmental Assessment (SEA) Directive 2001/42 /EC which is intended to assess the effects of certain plans and programmes on the environment.

1.6 The purpose of the Sustainability Appraisal (SA) report is to demonstrate that environmental, social and economic considerations have been properly taken into account in the preparation of the Local Plan. It is important to reconcile the need for social and economic development with the protection of the environment as this is the key to the delivery of sustainable development in the District.

1.7 There are five key stages and a series of sub-stages involved in the SA process which are outlined in Table 1 below.

STAGE A: Setting the context and objectives, establishing the baseline and deciding on the scope	
A1	Identifying other relevant policies, plans and programmes and sustainability objectives
A2	Collecting baseline information
A3	Identifying sustainability issues and problems
A4	Developing the SA framework (objectives, targets and indicators)
A5	Consulting on the scope of the SA
STAGE B: Developing and refining options and assessing effects	
B1	Testing the Local Plan objectives against the SA framework
B2	Developing the Local Plan options
B3	Predicting the effects of the Local Plan options
B4	Evaluating the effects of the Local Plan options
B5	Considering ways of mitigating the effects and maximising the beneficial effects
B6	Proposing measures to monitor significant effects of implementing the Local Plan

STAGE C: Preparing the sustainability appraisal report	
C1	Preparing the SA report

STAGE D: Consulting on the preferred options of the DPD and SA report and preparing the submission document	
Preferred Options Document	
D1	Public participation on the preferred options of the Local Plan and SA report
Submission Document	
D2 (i)	Preparation of the submission document and appraising significant changes made since preferred options
Following Examination in Public	
D2 (ii)	Appraising significant changes resulting from representations made by the planning inspector
D3	Making decisions and providing information – preparing the adoption statement

STAGE E: Monitoring the significant effects of implementing the DPD	
E1	Finalising aims and methods for monitoring
E2	Responding to adverse effects.

Table 1: Stages involved in the SA process

1.8 We are effectively at Stage D2 (i) of the process. The proposed submission Local Plan and supporting SA report are to be published in accordance with Regulations 19 and 35 of The Town and Country Planning (Local Planning) (England) Regulations 2012, prior to submission to the Secretary of State for Examination.

Section Two: Context of the Local Plan

Stage A : Setting the context and objectives, establishing the baseline and deciding on the scope

2.1 Stage A of the SA process is about identifying and analysing relevant contextual and baseline information, in order to develop the Sustainability Appraisal framework that is used to 'test' the Draft Local Plan. This stage was undertaken in July 2007 and was subsequently updated in December 2009 and July 2014 with a range of new evidence, in consultation with local communities and key relevant stakeholders.

2.2 The full SA report also takes account of a range of new evidence collected during the preparation of the draft Local Plan, including updated census information, local demographic projections and housing market data. The National Planning Policy Framework and emerging Local Plans prepared by neighbouring districts have also been a key consideration in both the formation of local policies and the ongoing sustainability appraisal, to ensure that they conform with national and local planning policies.

A1 - Setting the context

2.3 An important element of Stage A is to define the policy context within which the Local Plan sits. This involves a review of all relevant plans and strategies that both influence and are influenced by the Local Plan. A summary of the plans and strategies that have been considered is set out at Appendix 2 of the full SA report.

A2 - Collecting Baseline Information

2.4 The collection of relevant baseline information is a key component of the SA process as it helps to define the sustainability issues and problems facing the District. It also provides the basis for predicting and monitoring the effects of the plan. The findings of the baseline information analysis are presented in full in the SA scoping report and are reflected in Section 3 of the full SA report.

A3 - Identifying sustainability issues and problems

2.5 Task A3 involves drawing on the evidence gathered throughout stages A1 and A2 to determine the key social, environmental and economic issues facing the District. The key sustainability issues facing West Oxfordshire are summarised in Table 2 below. Further explanation is provided in the full SA report.

S1)	Like many areas the District has an ageing population. As the population ages, more people may require increased support in terms of housing, healthcare and transport. Demographic changes, including an ageing population, are also resulting in smaller households.
S2)	House prices in West Oxfordshire have increased at a faster rate than wages making it more difficult for local people to enter the housing market. This has resulted in rising levels of housing need.
S3)	General levels of health in the District are high but specific health issues such as obesity have increased in prominence nationwide and are a particular concern in children, indicating a need to change our diet but also increase physical activity. Although a rural district with large areas of attractive countryside, rural communities can find that, outside the rights of way network, access to public open space is limited.
S4)	Levels of unemployment in the District are typically low. Low skills levels are apparent in certain areas of the main towns of Witney, Chipping Norton and Carterton and may have implications for future economic growth.
S5)	There is a low level of crime and fear of crime but speeding vehicles, violent crime and antisocial behaviour remain issues of concern.
S6)	Outside of the main towns of the District public transport accessibility is generally poor. Certain groups without access to a car, such as older people on lower incomes, young people, lone parents and those experiencing mental health problems may be particularly at risk of social exclusion as a result. An ageing population presents increasing challenges as the elderly are highlighted as a particular group least likely to have access to a private car.
S7)	The number of people travelling to work by car has increased and the distance people travel to work has increased. The District has several congestion problems. The A40 between Witney and Oxford is seen as one of the County's worst congestion problem.
S8)	Air quality objectives are not being met at Bridge Street, Witney and Horsefair, Chipping Norton as a result of traffic congestion in these streets.
S9)	Many of the larger previously developed sites suitable for redevelopment have now been developed and in a rural district the opportunities to use brownfield land are limited. Beyond 2011 further urban extensions on greenfield sites will need to be provided. Such urban extensions may be relatively sustainable if the infrastructure required to support them is provided and efficient use is made of the land. It should also be noted that whilst there is the presumption that previously developed land should be developed before Greenfield land, some previously developed land may not be appropriate for development due to wider sustainability considerations such as their amenity or biodiversity value.

S10)	Although the proportion of waste being recycled or composted is increasing the amount of waste being produced also appears to be increasing although this may reflect increases in collection.
S11)	Although data on carbon emissions is limited, responding to climate change and reducing carbon emissions through increased energy efficiency and increasing the supply of renewable and low-carbon decentralised energy sources is seen as a key challenge.
S12)	Significant climate change is now thought unavoidable and is expected to result in more frequent extreme weather events. As such there is a need to secure new development and infrastructure which is resilient to the effects of climate change particularly as buildings and infrastructure may have a 20-100 year life span.
S13)	There is a network of relatively isolated sites of particular importance for biodiversity in the District, which in the context of climate change would benefit from expansion and linkage to provide more sustainable biodiversity management units. The status of some priority species, notably water voles and farmland birds, has declined in recent years. Farmland birds have declined largely as a result of some agricultural practices.
S14)	The District has a rich archaeological and architectural heritage which along with the natural beauty of the District's countryside contributes to a high quality landscape recognised in national designations such as the Cotswolds Area of Outstanding Natural Beauty. These assets also present an irreplaceable resource for education, leisure and tourism. Meeting the development needs of the community whilst maintaining a high quality landscape, including the conservation and enhancement of areas, sites and buildings that contribute to the archaeological, architectural and natural heritage, and promoting access to historic assets and the countryside remains a continuing challenge
S15)	The economy of West Oxfordshire appears prosperous with low unemployment levels and high levels of economic activity. A key challenge is to maintain this prosperity and ensure sustainable economic growth, maintaining the Quality of Life for all residents
S16)	The District contains some considerable sand, gravel and limestone resources, the extraction of which needs to be managed to protect environmental quality, with particular regard to archaeological sites and remains, landscape impacts, after-use and traffic impacts.

Table 2: Key sustainability issues in West Oxfordshire

A4 - Developing the SA Framework (objectives, targets and indicators)

2.6 A key outcome of the Stage A SA scoping process was to define a series of objectives against which the sustainability of the Pre-Submission Draft Local Plan can be assessed. These objectives along with a series of sub-objectives are based on the evidence gathered through Stages A1-A3 and define the SA framework, which is used to assess the significant sustainability effects of the Pre-Submission Draft Local Plan.

2.7 There are 16 headline sustainability objectives that form the West Oxfordshire SA framework and these are set out in Table 3 below;

1.	Ensure everyone has the opportunity to live in a decent, sustainably constructed affordable home
2.	Improve health and well-being and reduce inequalities
3.	Promote thriving and inclusive communities
4.	Improve education and training

5.	Maintain a low level of crime and fear of crime
6.	Improve accessibility to all services and facilities
7.	Improve the efficiency of land use
8.	Reduce waste generation and disposal
9.	Reduce air pollution and improve air quality
10.	Address the causes of climate change by reducing greenhouse gas emissions and be prepared for its impacts
11.	Protect and improve soil and water resources
12.	Reduce the risk from all sources of flooding
13.	Conserve and enhance biodiversity and geodiversity
14.	Conserve and enhance landscape character and the historic environment
15.	Maintain high and stable levels of employment
16.	Promote sustainable economic growth and competitiveness

Table 3: West Oxfordshire sustainability objectives

A5 - Consulting on the Scope of the SA

2.8 The consultation period on the West Oxfordshire SA scoping report ran from the 23rd March 2007 to 27th April 2007. A summary of the comments received is included in the full SA report along with actions that were taken to address any concerns regarding the scope of the SA.

Section Three: Appraisal of the Draft Local Plan

Stage B Developing and refining options and assessing effects

3.1 The SA framework has been used to assess and refine various options through the 6 key tasks involved in stage B:

- B1 Testing the Local Plan objectives against the SA framework
- B2 Developing the Local Plan options
- B3 Predicting the effects of the Local Plan options
- B4 Evaluating the effects of the Local Plan options
- B5 Considering ways of mitigating the effects and maximising the beneficial effects
- B6 Proposing measures to monitor significant effects of implementation the Local Plan

3.2 In order to summarise the detailed findings of the SA clearly and succinctly and to enable the effective testing of options, a simple scoring matrix was defined and is illustrated in Table 4 below. The scoring matrix was updated in 2014 in order to make the identified sustainability effects of the Local Plan clearer.

Categories of Significance		
Symbol	**Meaning**	**Sustainability Effect**
x	Absolute constraints	Absolute sustainability constraints to development, for example, internationally protected biodiversity
- -	Major Negative	Problematical and improbable because of known sustainability issues; mitigation likely to be difficult and/or expensive
-	Minor negative	Potential sustainability issues: mitigation and/or negotiation possible

+	Minor positive	No sustainability constraints and development acceptable
++	Major Positive	Development encouraged as would resolve existing sustainability problem
?	Uncertain	Uncertain or Unknown Effects
0	Neutral	Neutral effect
- 0	Certain SA Objectives consider more than one topic and as a result the plan could have different effects upon each topic considered. For example, SA Objective 11 relates to soil as well as water quality and resources. An Option could have a negative effect on soil through the loss of best and most versatile agricultural land but also have a neutral effect on water quality and resources.	

Table 4: SA scoring matrix

Developing the Local Plan options, predicting and evaluating the effects of the options and potential mitigation and maximisation of benefits.

3.3 Ongoing consultation since 2007 has enabled the testing and refinement of various policy options to address the key issues facing the district. The full SA report documents each sub-stage in detail and demonstrates how the Local Plan options have been tested and refined through the SA process. Box 1 below provides a brief summary including a series of web links to the relevant consultation documents.

Issues and Options (March 2008)
http://www.westoxon.gov.uk/files/download/5253-2812.pdf
The first stage in the process was an issues and options consultation which identified the key issues facing the District and a range of broad spatial options for development as well as a number of key theme based questions designed to stimulate discussion about the future development of the area.

Interim position statement (February 2009)
http://planningconsultation.westoxon.gov.uk/consult.ti/CSInterimFeb09/consultationHome
The interim position statement built on the findings of the Issues and Options consultation by presenting an overview of the Council's likely approach to tackling the key issues facing West Oxfordshire particularly housing and employment strategies as well as the response to climate change.

The document presented a range of updated information, particularly in relation to housing and the Strategic Housing Land Availability Assessment process used to identify potential housing sites in the District. On the basis of the evidence and information available at the time, a draft approach for the basis of the Local Plan was set out.

Preferred Approach (February 2010)
http://planningconsultation.westoxon.gov.uk/inovem/consult.ti/CSPreferredApproach/consultationHome
This document built on the earlier consultation and set out the Council's preferred approach to a number of issues. It was accompanied by a sustainability appraisal to assist in the consultation and the further development/ refinement of alternative options. The SA is available at http://planningconsultation.westoxon.gov.uk/gf2.ti/f/193986/3446853.1/pdf/-/Core%20Strategy%20Preferred%20Approach%20Sustainability%20Appraisal%20%20print%20version%20with%20maps.pdf .

Each section of the SA reflected a chapter of the document to enable the systematic appraisal of options but with particular regard to;

- **The settlement strategy;**

- **Economic strategy; and**
- **Strategic development areas for the main settlements.**

Draft Core Strategy (January 2011)
http://planningconsultation.westoxon.gov.uk/consult.ti/Draft_Core_Strategy_January_2011/consultationHome

The Draft Core Strategy (now referred to as Local Plan) built upon the preferred approach and set out a detailed draft policy structure for the future development of the District. The draft strategy was accompanied by a sustainability appraisal which illustrated how the policies were derived from a series of options and how these options performed against the SA objectives. The SA is available at http://www.westoxon.gov.uk/files/download/8119-3892.pdf

Opportunity for further comment (June 2011)
http://planningconsultation.westoxon.gov.uk/consult.ti/Draft_Core_Strategy_June_2011/consultationHome
Further comments were invited following the publication of updated evidence and information relating to strategic development options.

Draft Local Plan Consultation
http://planningconsultation.westoxon.gov.uk/consult.ti/Draft_Local_Plan_2012/consultationHome
6 week consultation on complete Draft Local Plan including all policies and proposed strategic housing and employment allocations. The Draft Plan was supported by a comprehensive sustainability appraisal which covered the complete evolution of policies and allocations from 2008-2012

Local Plan Housing Consultation
http://planningconsultation.westoxon.gov.uk/consult.ti/Housing_Consultation/consultationHome
6 week consultation covering housing elements of the Local Plan including the spatial strategy, the proposed quantum of housing growth until 2029 and the proposed sites to accommodate the housing growth. The consultation document was accompanied by an updated sustainability appraisal which reappraised options for the spatial strategy, level of housing growth and site options in Witney, Carterton and Chipping Norton.

Box 1: Local Plan consultations completed to date

3.4 Throughout these various stages, a wide range of options have been consulted upon and tested through the Sustainability Appraisal process in order to identify the most appropriate and sustainable strategy for the District.

3.5 The main options that have been consulted upon and tested throughout the development of the Local Plan relate to the following issues:

1. Overall Settlement Strategy
2. Level of Housing Growth
3. Delivery of Affordable Housing
4. Level of Employment Growth
5. Directions of Growth at Witney
6. Directions of Growth at Carterton
7. Direction of Growth at Chipping Norton

Overall Settlement Strategy

3.6 Various options for the overall settlement strategy for the District have been assessed throughout the development of the Local Plan. These include:

- 'Witney Focus': Concentrate development at Witney
- 'Three Towns': Concentrate development at Witney, Carterton and Chipping Norton
- 'Dispersal': More dispersed development amongst a variety of towns and villages but still including development in Witney, Carterton and Chipping Norton
- A new village
- Concentration of development along transport corridors

3.7 Throughout the consultation process, most support has been expressed for the 'three towns' option that focuses the majority of development at the three main towns of Witney, Carterton and Chipping Norton with more limited development elsewhere.

3.8 The options relating to the creation of a new village and the concentration of development along transport corridors were scoped out early on in the consultation process as they were not considered to be realistic or achievable for a variety of reasons.

3.9 A sustainability appraisal of the three main options was undertaken at the 'Preferred Approach' stage and again as part of the 2014 focussed housing consultation stage. The results of the 2014 appraisal are illustrated in table 6 below.

SA Objective	Options		
	'Witney Focus'	'Three Towns'	'Dispersed'
1. Ensure everyone has the opportunity to live in a decent, sustainably constructed affordable home	+ / -	++	+ / -
2. Improve health and well-being and reduce inequalities	+ / -	+ / -	+ / ?
3. Promote thriving and inclusive communities	+ / -	+	+ / -
4. Improve education and training	+ / -	+	-
5. Maintain a low level of crime and fear of crime	0	0	0
6. Improve accessibility to all services and facilities	+ / --	+ / -	- / ?
7. Improve the efficiency of land use	-	-	-
8. Reduce waste generation and disposal	0	0	0
9. Reduce air pollution and improve air quality	- ?	0 ?	0 ?
10. Address the causes of climate change by reducing greenhouse gas emissions and be prepared for its impacts	?	?	- / ?
11. Protect and improve soil and water resources	0 / ?	0 / ?	0 / ?
12. Reduce the risk from all sources of flooding	0	0	0
13. Conserve and enhance biodiversity and geodiversity	?	?	?
14. Conserve and enhance landscape character and the historic environment	-- / ?	- / ?	-- / ?

SA Objective	Options				
	'Witney Focus'		'Three Towns'	'Dispersed'	
15. Maintain high and stable levels of employment	+	-	++	+	-
16. Promote sustainable economic growth and competitiveness	+	-	++	+	-

Table 5: SA summary of overall settlement strategy

3.10 The reasons for selection/rejection of alternatives for the spatial strategy options are set out below. It should be noted that whilst the SA findings are considered by the Council in its selection of options and form part of the evidence supporting the Local Plan, the SA findings are not the sole basis for a decision; other factors, including planning and deliverability, play a key role in the decision-making process.

Strategic Options Considered and Appraised	Reasons for Progressing or Rejecting the Option in Plan Making
'Witney Focus': Concentrate development at Witney	Witney is the largest town in West Oxfordshire and is the focus for much of the District's employment provision and community infrastructure. Although the town is a sustainable location for accommodating a relatively significant volume of growth, the needs of communities throughout the rest of the district in terms of housing, community infrastructure and economic development will not be directly addressed through this strategy. Concentrating all development at Witney will fundamentally alter the character of the settlement with large scale expansion at the urban edge potentially resulting in coalescence with surrounding villages. Infrastructure improvements arising through new development are unlikely to be sufficient to accommodate the level of growth required in the Local Plan, resulting in environmental degradation of Witney. Rural settlements could become further marginalised and isolated as development is restricted in locations where it is needed to meet identified needs.
'Three Towns': Concentrate development at Witney, Carterton and Chipping Norton with a limited amount of dispersal across the District	This option will enable the needs of communities throughout the whole of the district to be better addressed, through the dispersal of development to a number of sustainable locations, where existing communities, infrastructure provision and employment opportunities will help new development to integrate into the existing fabric of the District. The primary focus on the three main towns will ensure the majority of new development delivered over the lifetime of the Local Plan benefits from good access to a range of services, facilities and employment opportunities.
'Dispersal': More dispersed	Complete dispersal of development throughout the whole of

Strategic Options Considered and Appraised	Reasons for Progressing or Rejecting the Option in Plan Making
development amongst a variety of towns and villages but still including development in Witney, Carterton and Chipping Norton	West Oxfordshire would be contrary to the aims and objectives of other plans and strategies affecting the District, such as the AONB Management Plan, as well as policies within the adopted and emerging Local Plans. The high quality landscape and the rich heritage of the towns and villages throughout the District are fundamental to the prosperity of the area, as well as the quality of lives of local communities. Although the benefits of some dispersal are recognised, such as sustaining the vitality of rural communities, it is considered that full dispersal of development would be too detrimental to the distinctive qualities of West Oxfordshire as a whole.

Table 7: Summary of Approach to Alternatives Assessment and Selection for the Distribution of Growth

Level of Housing Growth

3.11 In terms of the level of housing growth, at the Issues and Options stage (2008), the number of new homes needed was dictated by the then emerging South East Regional Plan, which identified a total housing requirement of 7,300 dwellings in the period 2006 - 2026.

3.12 Because the South East Plan specified the level of housing to be provided within the District, no other options were put forward or tested (i.e. higher or lower) although various options were proposed as to how the number of houses identified should be accommodated within the District.

3.13 At the Interim Approach stage (2009) and Preferred Approach stage (2010) the level of housing proposed to be provided was also based on the South East Plan although the figures were updated to take account of recent commitments (i.e. planning permissions).

3.14 Notably however, in light of the potential revocation of the South East Plan, the draft Core Strategy (2011) was informed by a local demographic projections (https://www.westoxon.gov.uk/files/download/7979-4251.pdf) independently commissioned by the Council. The projection suggested that there was a need to deliver an additional 4,300 homes in the district between 2011 and 2026. Coincidentally this was broadly in line with the South East Plan once completions in the period 2006 – 2011 had been taken into account.

3.15 In 2012, Council commissioned a further set of housing projections to help inform the development of a local housing target. Three different 'scenarios' were prepared: a 'natural change' scenario (4,000 houses), an 'employment-based' scenario (6,700 houses) and a 'South East Plan' based scenario (5,500 houses).

3.16 These three options were tested using the SA framework at the Draft Local Plan stage to determine their social, economic and environmental implications. A summary of the appraisal is set out in Table 7 below.

Sustainability Objective	Low Growth 4,000	Medium Growth 5,500	High Growth 6,700
1. Ensure everyone has the opportunity to live in a decent, sustainably constructed affordable home	+	++	++
2. Improve health and well-being and reduce inequalities	+	+	+
3. Promote thriving and inclusive communities	+	++	++
4. Improve education and training	+	+	+
5. Maintain a low level of crime and fear of crime	?	?	?
6. Improve accessibility to all services and facilities	+	+	+
7. Improve the efficiency of landuse	?	?	?
8. Reduce waste generation and disposal	?	?	?
9. Reduce air pollution and improve air quality	+/-	+/-	+/-
10. Address the causes of climate change by reducing greenhouse gas emissions and be prepared for its impacts	+/-	+/-	+/-
11. Protect and improve soil and water resources	+/-	+/-	+/-
12. Reduce the risk from all sources of flooding	+/-	+/-	+/-
13. Conserve and enhance biodiversity and geodiversity	+/-	+/-	+/-
14. Conserve and enhance landscape character and the historic environment	+/-	+/-	-
15. Maintain high and stable levels of employment	+/-	+	+
16. Promote sustainable economic growth and competitiveness	-	+	+

Table 8: SA summary of housing growth options

3.17 The summary table above illustrates that the medium growth option delivers the most positive sustainability outcomes, providing sufficient housing growth to support the necessary economic growth in the district through the duration of the plan, while limiting the impact on the historic and landscape character of the district, particularly at the rural / urban fringe. The medium and high options will deliver a significant amount of affordable housing but the low growth scenario is less effective. All options will contribute to the provision of necessary social, physical and green infrastructure to support local communities but the low growth option limits the opportunity to provide new or enhanced infrastructure. All options will also result in a range of positive and negative outcomes in relation to air quality, climate change, natural resources, flood risk and biodiversity and will be dependant on other relevant policies in the Local Plan to mitigate impacts.

3.18 In accordance with the National Planning Policy Framework (NPPF) and the requirement for Local Plans to meet the full objectively assessed needs for market and affordable housing in the housing market area, a Strategic Housing Market Assessment (SHMA) was published in

April 2014, which identified the overall need for housing in Oxfordshire to 2031. The findings indicated that a higher level of housing growth is required to meet the needs of West Oxfordshire District than was previously proposed in the Draft Local Plan (2012) for the medium growth scenario.

3.19 It was therefore necessary to retest options for housing growth in the District having regard to the higher levels of housing need identified in the SHMA (2014). The results are summarised in Table 9 below.

SA Objective	Options									
	1		2		3		4		5	
	500 dwellings per year		541 dwellings per year		590 dwellings per year		660 dwellings per year		800 dwellings per year	
1. Ensure everyone has the opportunity to live in a decent, sustainably constructed affordable home	+		+		+		++ ?		++ ?	
2. Improve health and well-being and reduce inequalities	+	-	+	-	+	-	+	-	+	-
3. Promote thriving and inclusive communities	+		+		+		++ ?		++ ?	
4. Improve education and training	+		+		+		+ ?		+ ?	
5. Maintain a low level of crime and fear of crime	0		0		0		0		0	
6. Improve accessibility to all services and facilities	+	?	+	?	+	?	+	?	+	?
7. Improve the efficiency of land use	-	?	-	?	-	?	--	?	--	?
8. Reduce waste generation and disposal	0 ?		0 ?		0 ?		0 ?		0 ?	
9. Reduce air pollution and improve air quality	0 ?		0 ?		0 ?		0 ?		0 ?	
10. Address the causes of climate change by reducing greenhouse gas emissions and be prepared for its impacts	0	?	0	?	0	?	0	?	0	?
11. Protect and improve soil and water resources	0	?	0	?	0	?	0	?	0	?
12. Reduce the risk from all sources of flooding	0		0		0		0		0	
13. Conserve and enhance biodiversity and geodiversity	?		?		?		?		?	
14. Conserve and enhance landscape character and the historic environment	-	?	-	?	-	?	--	?	--	?
15. Maintain high and stable levels of employment	+		+		+		++ ?		++ ?	

SA Objective	Options				
	1	2	3	4	5
	500 dwellings per year	541 dwellings per year	590 dwellings per year	660 dwellings per year	800 dwellings per year
16. Promote sustainable economic growth and competitiveness	+	+	+	++ ?	++ ?

Table 9: Summary of SA Findings for Growth Options (2014)

3.20 The appraisal found that as the level of growth increases so does the likelihood and potential significance of positive effects of the Options against SA Objectives relating to the provision of housing, communities and economy and employment.

3.21 The appraisal also found that as the level of growth increases so does the likelihood and potential significance of negative effects against SA Objectives relating to human health, the efficient use of land, traffic, air quality, biodiversity and heritage. It is considered that appropriate mitigation will be provided through Local Plan policies and available at the project level to address potential significant negative effects on health, traffic, air quality, biodiversity and heritage. However, at this stage there is also an element of uncertainty, as the nature and significance of effects will be dependent on the precise location of development and sensitivity of receptors. At this stage, there are no significant differences in the predicted nature and significance of effects between the options.

3.22 All of the options are considered to have the potential for major long-term negative effects on the landscape.

3.23 Table 10 provides an outline of the reasons for selection/rejection of alternatives for the level of growth where relevant. It should be noted that whilst the SA findings are considered by the Council in its selection of options and form part of the evidence supporting the Local Plan, the SA findings are not the sole basis for a decision; other factors, including planning and deliverability, play a key role in the decision-making process.

Strategic Options Considered and Appraised	Reasons for Progressing or Rejecting the Option in Plan Making
Option 1: 500 dwellings per year (a reasonable proxy for the average completion rate from 1991 – 2011 (473 per annum)	Although previous appraisals have indicated that this level of growth would be constrained by environmental constraints affecting the District and other issues including infrastructure capacity, it is evident that there is a need to boost planned housing supply in order to meet identified needs. A target of 500 homes per annum would exceed the long-term average from 1991 – 2011 of 474 homes per annum and therefore represent a 'boost' in housing supply as required by the NPPF. It would be less effective than the other options in terms of meeting affordable housing needs and economic forecasts, however the affordable housing model used in the SHMA is not designed to set an overall housing target and furthermore, economic forecasts are notoriously unreliable

Strategic Options Considered and Appraised	Reasons for Progressing or Rejecting the Option in Plan Making
	and because they are based on forecast population increases, have also been influenced by above average rates of past housing delivery within the District. On balance however it is considered that the housing target should exceed 500 homes per annum; therefore, this option has been rejected.
Option 2: 541 dwellings per year (Demographic Base + Shortfall as identified in the SHMA 2014)	Option 2 would represent a more significant 'boost' to housing supply in line with the NPPF and would help to meet affordable housing needs and economic forecasts more fully (notwithstanding the concerns relevant to those set out above). However, it is important to note that the SHMA itself recognises that the demographic projections for West Oxfordshire have been affected by past rates of housing delivery within the District. On balance, a housing target broadly in line with Option 2 is likely to strike a reasonable balance between the need to meet housing needs including affordable housing and support economic growth. This option has therefore been progressed (albeit at a slightly reduced rate of 525 homes per annum).
Option 3: 590 dwelling per year (baseline economic growth scenario as identified in the SHMA 2014)	Option 3 would clearly represent a more significant 'boost' to housing supply than Options 1 and 2, in line with the NPPF, but at 590 homes per annum this would be considerably higher than the long-term average trend (474 homes per annum 1991 – 2011). It is therefore questionable whether this quantum of development could be sustained over the period of the Local Plan. The District Council also has concerns about the job-led model used in the SHMA to derive the employment based housing requirements. Recent guidance published by the Planning Advisory Service after the SHMA was completed, highlights a number of limitations with such models which often result in significant population outputs compared to inputs. The Council's updated Strategic Housing Land Availability Assessment (SHLAA) also demonstrates that there are not enough suitable and deliverable sites available to meet such a high housing target. On balance it is considered that a housing target based on or around Option 3 would be too high and should not be taken forward.
Option 4: 660 dwelling per year (Midpoint Range as identified in the SHMA 2014)	The SHMA recommends a range of between 635 – 685 homes per annum in West Oxfordshire, the mid-point of which is 660 per annum. Again, whilst this would clearly represent a significant boost to housing supply, it would be much higher than long term average past rates of delivery and the ability to sustain this level of growth over the period of the Local Plan is therefore questionable. For the reasons set out previously the demographic projections for West Oxfordshire which feed into the recommended 660 homes

Strategic Options Considered and Appraised	Reasons for Progressing or Rejecting the Option in Plan Making
	per annum have been 'inflated' by the past 'over-supply' of housing in the period 2006 – 2011. Furthermore, the economic forecasts upon which this option is also based are highly ambitious and may not be realised. They are also policy-on, rather than policy-neutral insofar as they factor in aspirational job-growth relating to the Oxfordshire LEP. This would appear to be contrary to established case law which suggests an objective assessment of housing need should be 'policy neutral'. The provision of 660 homes per annum would also place the District's existing and planned infrastructure under greater pressure than Options 1 – 3 and would lead to the release of more greenfield land including potentially land within the AONB which covers around a third of the District. The Council's updated Strategic Housing Land Availability Assessment (SHLAA) also demonstrates that there are not enough suitable and deliverable sites available to meet such a high housing target. This option was therefore rejected.
Option 5: 800 dwellings per year (Midpoint Range as identified in the SHMA 2014 + 140 dwellings from neighbouring LPAs)	Option 5 considers the possibility of the District meeting its full 'unconstrained' housing need as identified in the SHMA and also a proportion of the housing need of other Districts (140 homes per annum). It is evident that Oxford City is unlikely to be able to meet its full housing need and therefore it is appropriate to consider the possibility of West Oxfordshire having to meet some of Oxford's 'unmet' need. On balance, it is considered that a target of 800 homes per annum would not be appropriate for the Local Plan. Whilst clearly representing a significant boost to housing supply, it is notable that in the 20-year period 1991 – 2011, delivery in excess of 800 homes per annum was only achieved in two years (2006 and 2007) and that was only possible because of several large housing schemes coming forward at the same time. The long-term average over the same period is much lower at 474 homes per annum. The Council's updated Strategic Housing Land Availability Assessment (SHLAA) also demonstrates that there are not enough suitable and deliverable sites available to meet such a high housing target. Other relevant considerations including the District's environmental constraints and infrastructure capacity, lead the Council to the conclusion that a target of 800 homes per annum is not appropriate or achievable. The Council is committed to a process of joint working with the other Oxfordshire local authorities through the duty to co-operate and will be involved in the process of assessing different options for meeting Oxford City's unmet housing need. If options are identified in West Oxfordshire this would be addressed through a focused early review of the new Local

Strategic Options Considered and Appraised	Reasons for Progressing or Rejecting the Option in Plan Making
	Plan.

Table 10: Summary of Approach to Alternatives Assessment and Selection for Growth Options

Affordable Housing

3.24 Housing affordability is a key issue for West Oxfordshire and a number of different options for increasing the supply of affordable housing in the District have been put forward to date.

3.25 Options for affordable housing provision identified at the Interim Approach stage (2009) included the following:

- Identification of further opportunities for redevelopment and intensification within existing housing estates owned by registered social landlords
- Secure additional rural exception sites in accordance with Local Plan Policy H12
- Identify as many sites as possible through the LDF process which can provide both market and affordable housing
- Increase the proportion of affordable housing to be provided on market sites above current levels
- Widen the range of sites where affordable housing is to be provided
- Seek financial contributions towards the provision of affordable housing from other development including non-residential.

3.26 A number of different options for the delivery of affordable housing have been presented at each stage of the Local Plan consultation, although there have been mixed views on both the proportion of new affordable housing to be delivered and the use of appropriate thresholds to trigger the delivery of affordable housing in the district.

3.27 Taking account of the responses received and the viability work that has been undertaken, the draft Local Plan included Core Policy 8 – Affordable Housing, which required the provision of 35% in Carterton, 40% in Witney and 50% elsewhere in the District. The threshold for provision is a net gain of one or more dwellings.

3.28 The affordable housing policy (Policy H3) of the proposed submission plan has been adapted to take account of updated national Planning Policy Guidance as well as updated local evidence on the viability of affordable housing delivery. Appendix VI of the full SA report provides a screening of policy changes. The proposed changes do not significantly affect the findings of the Draft Local Plan SA Report (Oct 2012).

Level of Employment Growth.

3.29 Various options have been proposed in relation to the level of employment growth to be delivered by the Local Plan.

3.30 At the Interim Approach stage, the options included:

• Indigenous Growth
- Provision of up to an additional 10ha of new employment land (40ha in total taking into account existing commitments of 30ha)
- Focus on indigenous growth to broadly match new labour supply

• Steady Growth
- Provision of an additional 30ha of employment land (60ha in total)
- Focus on supporting indigenous growth and business start ups whilst catering for a modest level of inward investment

• Higher Growth
- Provision of an additional 50ha of new employment land (80ha in total)
- Support indigenous growth but more active encouragement of inward investment

•Allocate a strategic area for employment in the Core Strategy

•Continue and expand criteria based policies for new employment sites

3.31 At the Preferred Options stage, four of these options were subject to a sustainability appraisal, taking account of feedback received through previous consultation. A summary of this SA is illustrated in Table 11below.

SA Objective	Indigenous Growth	Steady Growth	Higher Growth	Small Scale Dispersal
Promote thriving and inclusive communities	+/-	+	+	+
Improve accessibility to all services and facilities	+	+/-	--	+/-
Improve the efficiency of land use	+/-	+/-	+/-	+/-
Conserve and enhance biodiversity, geodiversity, landscape character and the historic environment	+/-	+/-	+/-	+/-
Maintain high and stable levels of employment	+/-	+	++	+
Promote sustainable economic growth and competitiveness	+/-	+	++	+

Table 11: SA summary of employment growth options

3.32 The sustainability appraisal demonstrated that the 'steady growth' and the 'small scale dispersal' scenarios provide the most positive impacts against the SA framework,

3.33 The steady growth option reflects the approach that had led to a reasonably successful economy to date and was broadly consistent with the regional and sub-regional planning and economic strategies. The indigenous growth option places greater emphasis on growth in small businesses, retail and tourism, reduces pressures on the labour supply and infrastructure and minimises new land requirements.

3.34 The option of providing more flexibility for small scale dispersal also scores positively if safeguards are included to limit the impact of excessive dispersal of employment development on the rural character of the area.

3.35 In light of this, the Council's 'preferred approach' was presented as being a combination of the Steady Growth and Small Scale Dispersal options.

3.36 This approach was carried forward into the draft Local Plan (2012). A full appraisal of the draft Local Plan employment policies was included in Appendix 2 of the full SA report.

3.37 Since the publication of the Draft Local Plan in 2012 there have been updates to the evidence base, which includes the West Oxfordshire Economic Study Update (2012) a new West Oxfordshire Economic Snapshot (2015) as well as the economic evidence underpinning the SHMA, the latter two reports confirming that the planned level of provision of 60 hectares of business land identified in the draft Local Plan (2012) is more than sufficient to meet future job forecasts. The updated evidence has therefore not identified any new reasonable alternatives to employment growth and the Council considers that the updated evidence does not significantly affect the findings of the SA for the employment growth options; therefore, the reasons for the selection/ rejection of options are still valid.

3.38 Table 12 provides an outline of the reasons for selection/rejection of alternatives for employment growth where relevant. It should be noted that whilst the SA findings are considered by the Council in its selection of options and form part of the evidence supporting the Local Plan, the SA findings are not the sole basis for a decision; other factors, including planning and feasibility, play a key role in the decision-making process.

Strategic Options Considered and Appraised	Reasons for Progressing or Rejecting the Option in Plan Making
Indigenous Growth	The indigenous growth strategy would only provide very modest amounts of new land for business development and would focus primarily on remaining allocations and existing commitments. Such a strategy would not provide choice in the market for land for existing businesses wishing to expand in West Oxfordshire or for new businesses wishing to invest in the District. This strategy is less likely to balance local economic development with the likely level of planned housing growth potentially driving higher levels of out commuting to neighbouring centres. This strategy will provide less certainty for investors and existing businesses through less clarity on the extent and availability of business development land in West Oxfordshire. This would be harmful to economic activity rates in the District.
Steady Growth	The steady growth strategy supports the indigenous growth of local businesses in West Oxfordshire while providing sufficient land for a modest amount of inward investment to the District. This strategy would be consistent with the past trends in economic development and the proposed development strategy for the District by focussing the majority of development at Witney, Carterton and Chipping Norton. It would also enable some distribution of employment development throughout the rest of the District without placing significant pressure on the environmental

	qualities of the rural areas. Identifying sufficient land within the main settlements to accommodate new inward investment will reduce the pressure on the district's infrastructure by concentrating development where the infrastructure is already in place or where planned improvements are due to take place. It will also reduce the need to travel by focussing development in close proximity to the main residential centres with sustainable transport links. Balancing housing growth with sufficient inward investment from new businesses will help to balance the economic and social needs of the District, better enabling people to live and work in the area and reducing the need to commute to other centres. The provision of new land for business development will also enable the expansion of established businesses through better availability and choice for land.
Higher Growth	The emphasis of this strategy is to encourage higher levels of inward investment to the District through the provision of greater areas of land for business development. This could potentially further reduce out commuting and reduce the pressure on the inter urban transport network but is likely to result in greater pressure on local transport infrastructure with the larger towns becoming the focus for more significant business and housing growth, as well as further in-commuting from surrounding areas. The strategy would also result in greater pressure on the natural and historic environment in West Oxfordshire while exceeding the amount of land required to balance economic development with the projected levels of housing growth required for the District.
Small-Scale Dispersal	The dispersal of development throughout the District would not be consistent with the overall spatial strategy for the District and is more likely to increase the need to travel via less sustainable means, by locating business development away from the primary population centres and the main public transport routes. Excessive dispersal of development is more likely to threaten the environmental qualities and rural character of the District; however, it must be recognised that some dispersal of business land is needed in order to ensure the needs of the rural economy are met.

Table 12 - Summary of Approach to Alternatives Assessment and Selection for Employment Growth

Directions for growth at Witney

3.39 Having regard to the overall settlement strategy, various options have been considered in relation to the potential direction of growth at Witney. Given that the availability of previously developed land in the town is limited, there is an acknowledged need to develop on the fringe of the town on undeveloped, greenfield land. There are effectively five main options - north, north east, east, south and west, each of which have been promoted through the consultation process for development by interested parties. These potential development areas are shown on the plan below.

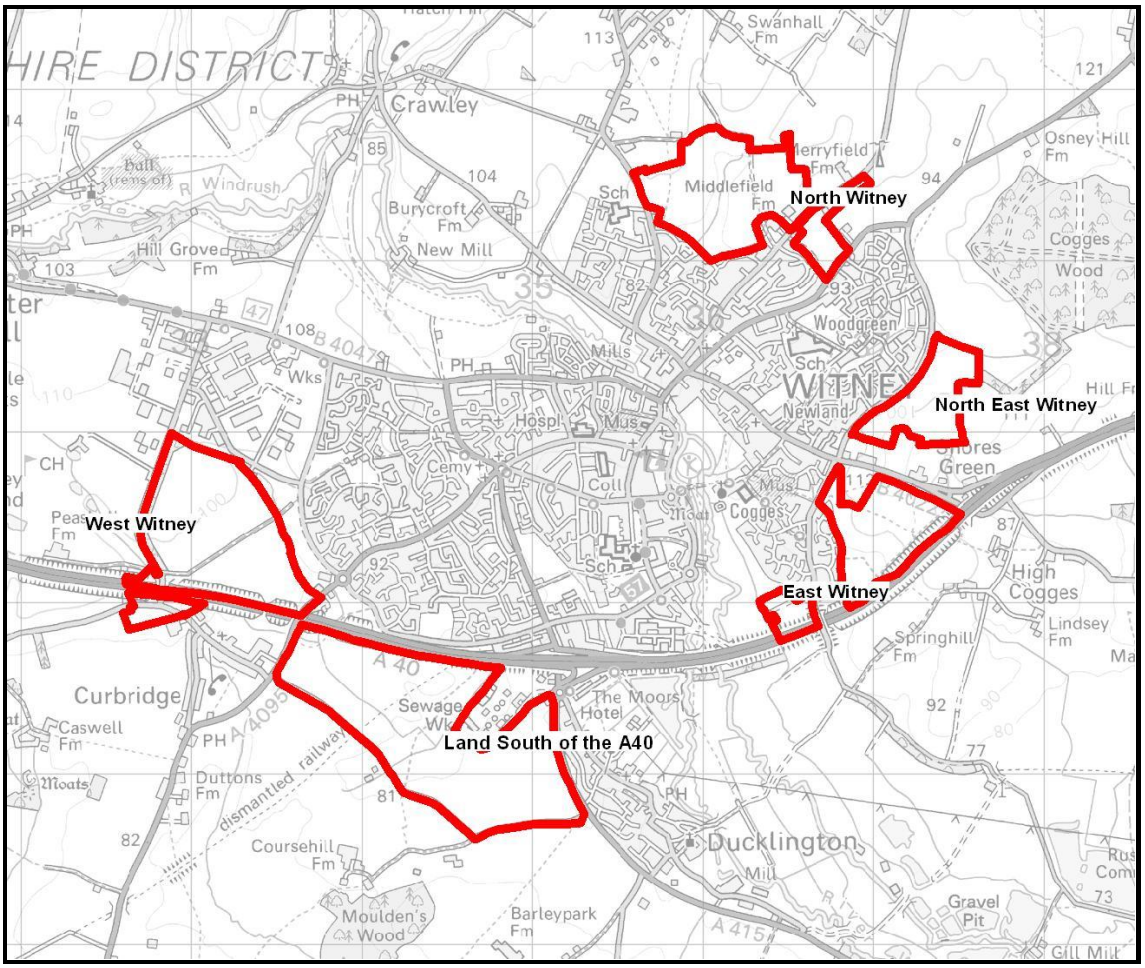

Figure 1: Witney strategic growth options

3.40 These options were all tested through a process of sustainability appraisal at the Preferred Approach stage (2010). The West Witney Option was identified as the most sustainable and deliverable option so was therefore progressed as a strategic development area by the Council.

3.41 Land to the north of Witney was identified as having the potential to deliver additional housing in the longer term after the life of the Plan. It could accommodate a mix of uses including community facilities and is relatively accessible to the town centre.

3.42 The East and North East Witney options were rejected as they were closely associated with the implementation of the Cogges Link Road, constrained by their topography and there was also the potential for a significant adverse visual impact. Land to the south beyond the A40 was rejected as development would result in unsustainable urban sprawl, would be dependent on car travel and would create a poor level of residential amenity.

3.43 Following the decision of the Secretary of State in 2012 not to allow the compulsory purchase order (CPO) needed for the Cogges Link Road (CLR) scheme at Witney to go ahead, the Council considered it necessary to re-appraise three of the strategic development area options at Witney through the SA process.

3.44 Land to the North East and South (of the A40) of Witney was not re-appraised through SA process because the Council considered that the Cogges Link decision did not significantly

affect the findings of the previous appraisal work, presented in the Draft Core Strategy SA Report (2011).

SA Objective	North 1,500 homes West End Link	East 500 homes Shores Green A40 Junction improvement	West 1,000 dwellings 10ha employment Downs Rd A40 Junction
Improve health and well being and reduce inequalities. Promote thriving and inclusive communities	+	++	+
Improve education and training	+	+	++
Improve accessibility to all services and facilities	+	++	+
Reduce air pollution and improve air quality	-	+	+/-
Protect and improve soil and water resources	+/-	+/-	+
Reduce the risk from all sources of flooding	+/-	+/-	+
Conserve and enhance biodiversity and geodiversity	-	-	+/-
Conserve and enhance landscape character and the historic environment	-	-	+/-
Maintain high and stable levels of employment Promote sustainable economic growth and competitiveness	+/-	+/-	++

Table 13: SA Summary of Witney strategic growth options (2012)

3.45 The Council re-appraised the North, West and East Witney options against the SA Framework with the findings presented in the Draft Local Plan SA Report (October 2012) which accompanied the Draft Local Plan on public consultation from 7th November to 19th December 2012. The findings of the SA are presented in Table 13 and helped to inform the selection and rejection of options in plan-making.

3.46 A Strategic Housing Market Assessment (SHMA) was published in April 2014, which identified the overall need for housing in Oxfordshire to 2031. The findings indicated that a higher level of housing growth is required to meet the needs of West Oxfordshire District than was previously proposed in the Draft Local Plan (2012).

3.47 The need for a higher level of housing growth made it necessary to reconsider the strategic development options at Witney. It was determined that four of the five previous options for strategic development should be re-appraised and based on updated evidence where available. This included the following strategic development options:

- Land south of the A40
- East Witney
- North Witney

- North East Witney

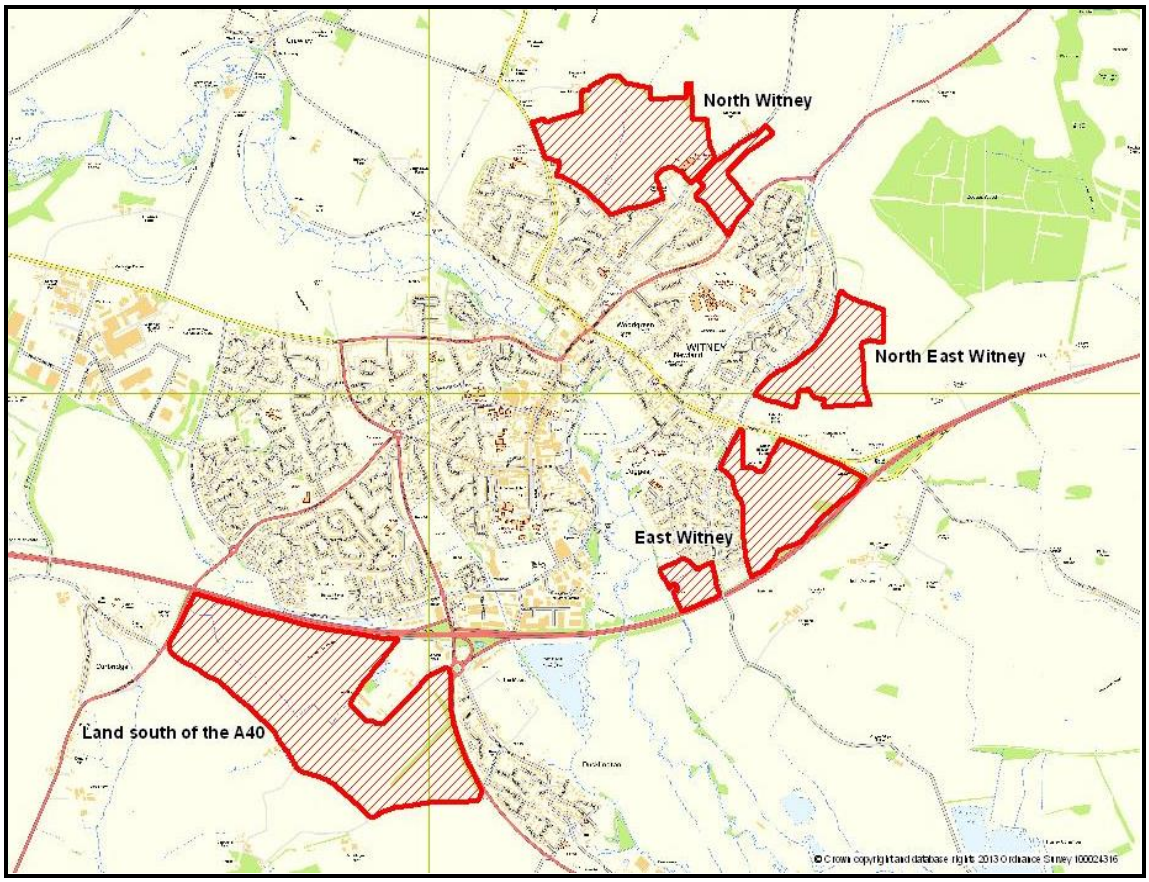

Figure 2: Witney strategic growth options

3.48 Some of the consultation responses to the Draft Local Plan SA Report (2012) questioned why a multi-site option was not being considered through the Local Plan and SA. It was therefore decided to undertake an appraisal of a multi-site option, which would comprise a combination of the four options identified above with the minimum level of development on any one site being 300 dwellings.

3.49 An appraisal of the following five strategic development options for Witney was undertaken against the full SA Framework using updated evidence where available:

- Land south of the A40
- East Witney
- North Witney
- North East Witney
- Multi-site

SA Objective	Options				
	South of the A40	East Witney	North Witney	North East Witney	Multi-site

SA Objective	Options									
	South of the A40		East Witney		North Witney		North East Witney		Multi-site	
1. Ensure everyone has the opportunity to live in a decent, sustainably constructed affordable home	++		++		++		++		++	
2. Improve health and well-being and reduce inequalities	+ ?		+ ?		+ ?		+ ?		+ ?	
3. Promote thriving and inclusive communities	+	-	+	?	+	+?	+	?	+	?
4. Improve education and training	+ ?		+ ?		+ ?		+ ?		+ ?	
5. Maintain a low level of crime and fear of crime	0		0		0		0		0	
6. Improve accessibility to all services and facilities	-	+	+ ?	+	+ ?	+?	-	+	-	?
7. Improve the efficiency of land use	-		-		-		-		-	
8. Reduce waste generation and disposal	0		0		0		0		0	
9. Reduce air pollution and improve air quality	- ?		+ ?		+ ?		- ?		- ?	
10. Address the causes of climate change by reducing greenhouse gas emissions and be prepared for its impacts	- ?	+	?	+	?	+	- ?	+	- ?	+
11. Protect and improve soil and water resources	0	--	0	-- ?	- ?	--	0	-- ?	- ?	-- ?
12. Reduce the risk from all sources of flooding	0		0 ?		0 ?		0		0 ?	
13. Conserve and enhance biodiversity and geodiversity	0 ?		0 ?		0 ?		0 ?		0 ?	
14. Conserve and enhance landscape character and the historic environment	--	--	--	--	--	--	--	--	- ?	-?
15. Maintain high and stable levels of employment	?		+ ?		+ ?		+ ?		+ ?	

SA Objective	Options				
	South of the A40	East Witney	North Witney	North East Witney	Multi-site
16. Promote sustainable economic growth and competitiveness	?	+ ?	+ ?	+ ?	+ ?

Table 14 - Summary of SA Findings for Strategic Development Area (SDA) Options in Witney (June 2014 and updated February 2015)

3.50 Table 15 provides an outline of the reasons for selection/rejection of alternatives for strategic development options in Witney where relevant. It should be noted that whilst the SA findings are considered by the Council in its selection of options and form part of the evidence supporting the Local Plan, the SA findings are not the sole basis for a decision; other factors, including planning and deliverability, play a key role in the decision-making process.

Strategic Options Considered and Appraised	Reasons for Progressing or Rejecting the Option in Plan Making
Land South of the A40	Land to the south of Witney is severed from the town by the A40, which forms a hard southern edge to the town and marks the boundary between the urban built up area of Witney and the rural, open countryside to south in the Lower Windrush and Thames Valleys. The A40 in particular would present a barrier to integration for new development in this location which is likely to form a separate entity and a distinct identity to other existing developments and established communities in Witney. There are likely to be significant amenity impacts arising from existing development in close proximity to the site such as the abattoir and sewage treatment works. Any development in this location should be compatible with the existing land uses so as not to inhibit any future expansion or modernisation that might be necessary for important local infrastructure. Recent landscape evidence (2015) suggests that the scale of development in this location would need to be reduced to around 500 homes in order to address the landscape sensitivities of the site. The development would also not provide any strategic highway improvements for Witney.
East Witney	Although development to the East of Witney would occupy a sensitive landscape area on rising land above the town, it is considered that the local topography will present a natural limit to the unchecked sprawl of new development in this location. The primary benefit of allocating land to the East of the town is to

Strategic Options Considered and Appraised	Reasons for Progressing or Rejecting the Option in Plan Making
	facilitate the development of the Shores Green slip roads which will deliver wider sustainability benefits to Witney as a whole. Development in this location would form a logical extension to existing residential development to the east of the town with good access to existing community services and facilities nearby. There are also good opportunities to link to and enhance pedestrian and cycle routes and to provide additional links over the River Windrush, to provide sustainable access to the town centre and local employment areas and to enhance the Green Infrastructure in this area.
North Witney	Land at North Witney has been considered on several occasions through previous Local Plan inquiries. In the most recent Inspector's report (June 2005) the Inspector concluded that taken in the round and subject to the provision of the West End Link (see below) the proposal (800 homes at that time) would represent a sustainable urban extension to Witney and would be acceptable in landscape terms The site is relatively proximate to the town's main services and facilities although not as close as other options to the main employment areas located in the south of the town. There are no known heritage assets that would be directly affected by development in this location although the route of the West End Link (see below) lies within and adjacent to the Witney Conservation Area. One of the primary benefits of allocating land to the north of Witney would be of the delivery of the West End link road, which has been safeguarded in successive local plans as a key piece of highway infrastructure needed to help alleviate congestion in and around the central core of Witney. In combination with other proposed strategic transport measures including the Down's Road A40 junction, Shores Green and Ducklington Lane improvements, the West End Link provides the opportunity to deliver significant wider benefits for Witney. Development to the north of the town could be phased to come forward later in the plan period, so as to allow other options including land at west and east Witney to come forward first. This would ensure the local market is not saturated with too much housing at one time and would allow time for delivery of the West End Link to be secured. Overall it is considered that north Witney represents a suitable and

Strategic Options Considered and Appraised	Reasons for Progressing or Rejecting the Option in Plan Making
	sustainable option for growth in the longer term, subject to sufficient landscape impact and flood risk mitigation being provided and delivery of supporting highway infrastructure including the West End Link and any supporting measures.
North East Witney	Development of land to the North East of Witney would result in detrimental landscape impact as it forms part a ridge circling the north east part of the town. Development to the east of Jubilee Way is undesirable as the road currently forms a distinct edge to the built up area beyond which the land makes a valuable contribution to the rural setting of the town. Development in this location would be disjointed from the existing residential development to the east of the town due to the boundary effect presented by Jubilee Way. Development in this location would also begin to encroach on Cogges Wood and would set an undesirable precedent for further eastern expansion of the town, onto land which has few obvious landscape features to contain the outward expansion of the town.
Multi-site	Development spread across multiple sites at a scale of around 300 dwellings in each area is unlikely to deliver the necessary community and highways infrastructure required, to address the sustainability issues identified in the town, including congestion, air quality and primary school capacity. Although this option would reduce the potential impacts on landscape and historic character in each of the edge of town locations, the limited potential to deliver wider sustainability benefits to the town as a whole reduces the suitability of this option. It is considered that consolidating the growth on fewer sites along with on-site community infrastructure and complementary highways infrastructure would better address the needs of Witney.

Table 15 - Summary of Approach to Alternatives Assessment and Selection for Strategic Development Area (SDA) Options in Witney

Directions of Growth at Carterton

3.51 A number of options for strategic development in Carterton have been considered through the development of the Local Plan. The relative lack of available previously developed (brownfield) land within the built up area to accommodate the projected level of growth meant that a series of greenfield sites beyond the urban edge were identified as potential strategic development locations. At the Preferred Approach stage (2010) four options were put forward:

- Option 1 – No major new expansion
- Option 2 – Northern extension
- Option 3 – Eastern extension
- Option 4 – Western extension

3.52 Given the proximity of RAF Brize Norton to the south of Carterton, these four options were considered to be the only reasonable alternatives. Figure 3 below shows the location of the strategic development options in relation to the existing built up area of Carterton (note: the northern extension was split into two main parcels of land).

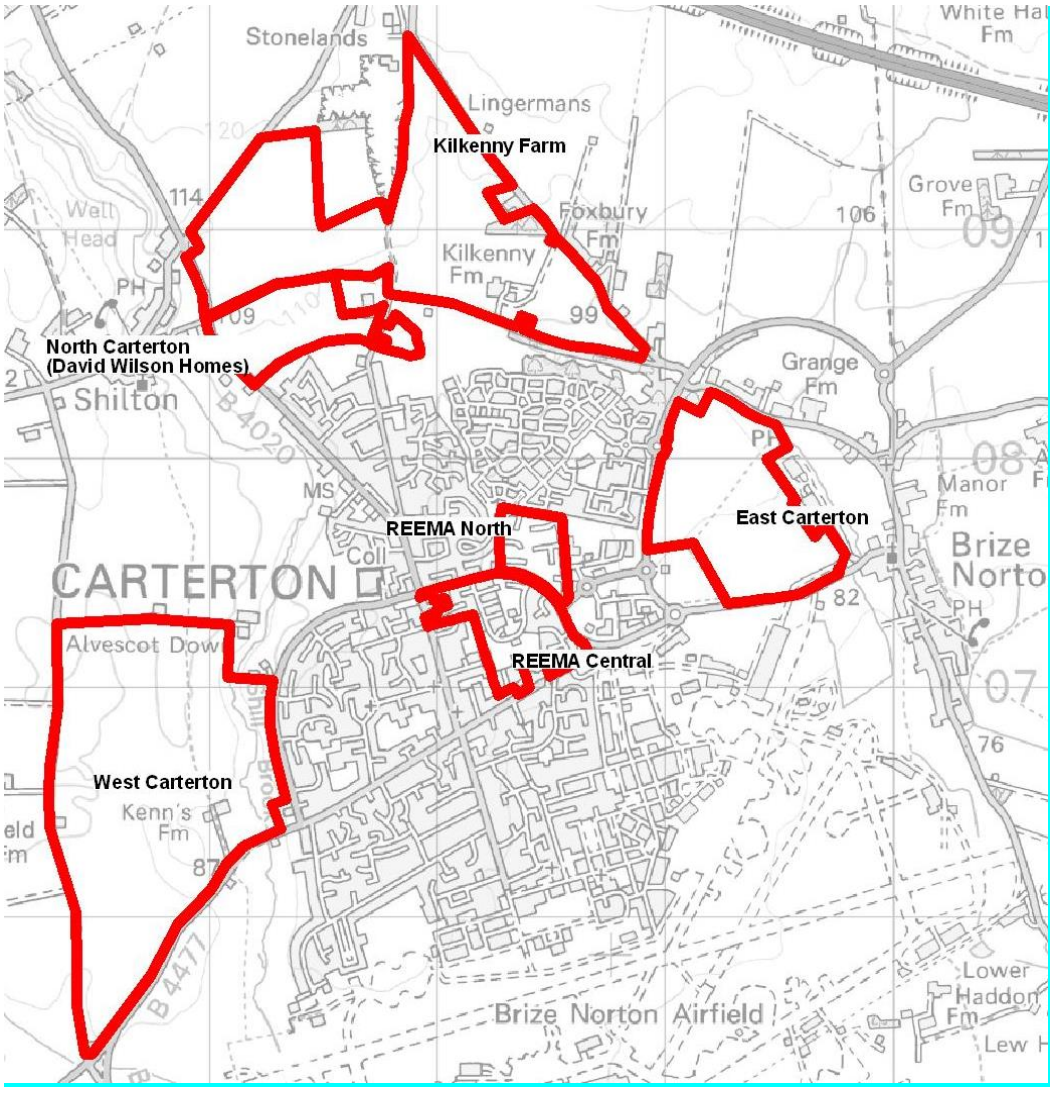

Figure 3: Carterton strategic growth options

3.53 In summary, the SA demonstrated that of the four options, the eastern option was the most accessible and provides the best potential for integration with the town. It did however raise potential negative impacts in relation to potential impact on the historic character of neighbouring Brize Norton village which would need to be taken into account through any development.

3.54 Although the site to the west of the town would provide a large, readily developable area of land, it was considered that development here would represent a significant incursion into the open countryside and would result in significant landscape impact. Development in this location would not be well integrated with the physical fabric of the town being separated by the Shill Brook valley which clearly marks the edge of the existing town.

3.55 Land to the north of the town has potential for a large development area but it the most constrained of the options due to the distance from existing services and facilities and the potential negative impact on the rural road network. The Northern Extension was therefore rejected. While the 'no major new expansion' option has the potential for a reduced environmental impact, it limits the ability to deliver new infrastructure and housing in the town, particularly affordable housing. Importantly, even with the DIO land in the centre of town being potentially made available to the open market, some development on the edge of Carterton will still be necessary in order to meet the overall housing requirement. The no major new expansion option was therefore rejected.

3.56 The preferred approach (2010) was therefore presented as being to develop either land to the west or east of Carterton with land to the north being considered a less sustainable option due to the constraints presented by the rural road network, accessibility to services and proximity to a working quarry.

3.57 Following the consultation on the Draft Core Strategy and SA Report in 2011 the Council received further information on the strategic development options for Carterton, which was submitted by land agents and other key stakeholders. In light of this further information the Council considered it necessary to re-appraise some of the options previously considered through the SA. The option for no major expansion was not re-appraised as it was tested effectively through the earlier stages of the SA process. The option limits the ability to deliver new infrastructure and housing in the town, particularly affordable housing. Importantly, even with the DIO land in the centre of town being potentially made available to the open market, some development on the edge of Carterton will still be necessary.

Sustainability Objectives	East (700)	West (1,000)	Kilkenny Farm (1,000)	North (David Wilson Homes) (300)
Decent, sustainably constructed and affordable homes	++	++	++	+
Promote thriving and inclusive communities	+	+/-	-	+/-
Improve education and training	+	+	+	+/-
Improve accessibility to all services and facilities	+	+/-	-	+/-
Improve efficiency of land use Protect and improve soil and water resources	+/-	+/-	-	+/-
Reduce the risk from all sources of flooding	+	+/-	+	+
Conserve and enhance biodiversity and	+	+/-	+	-

geodiversity				
Conserve and enhance landscape character and the historic environment	+/-	--	-	-
Maintain high and stable levels of employment Promote sustainable economic growth and competitiveness	+	+	+/-	+/-

Table 16: SA Summary of Carterton strategic growth options (2012)

3.58 The results of the SA indicated that the eastern option of 700 dwellings was the most sustainable option. The site has excellent accessibility which will encourage walking, cycling and use of bus services and the site can integrate well into the existing settlement, through incorporating a landscape buffer to Brize Norton village and extension to the Kilkenny Lane Country Park, landscape impact is limited. Land to the west would result in significant adverse landscape impact being a major incursion into open countryside. The accessibility of the site is reasonably good but is dependent on provisions of additional crossings of the Shill Brook. Although the development offers potential for ecological benefits, the development would require built development within an ecologically sensitive area and floodplain. The site is sequentially less preferable on flood risk grounds.

3.59 Kilkenny Farm has a poor relationship to existing services and public transport and would be poorly integrated with the town. The proposed development would have adverse landscape impacts. Land to the north (David Wilson Homes) is reasonably well related to existing services but access to public transport is not as strong as other site options. Development as proposed would have an adverse landscape impact, intruding into the setting of Shilton village and there are potential adverse biodiversity impacts. The size of the site limits the ability to deliver additional affordable housing.

3.60 In 2013 the Council announced that publication of the pre-submission draft Local Plan would be deferred until further work had been carried out to consider housing needs across Oxfordshire. A Strategic Housing Market Assessment (SHMA) was published in April 2014, which identified the overall need for housing in Oxfordshire to 2031. The findings indicated that a higher level of housing growth is required to meet the needs of West Oxfordshire District than was previously proposed in the Draft Local Plan (2012).

3.61 The need for a higher level of housing growth made it necessary to reconsider the strategic development options in Carterton.

3.62 It was determined that four of the five previous options for strategic development should be re-appraised and based on updated evidence where available. This includes the following strategic development options:

- East Carterton
- REEMA North & Central (previously 'no major new extension' option)
- Northern Extension (Kilkenny Farm site)
- West Carterton

3.63 It was decided not to re-appraise the north (David Wilson Homes) option through the SA process. The site promoter progressed a reduced scheme through a planning application and

stated that they had no intention of pursuing the larger, strategic site option through the Local Plan. The site will therefore no longer be considered through the Local Plan or the SA as a strategic development option.

3.64 Consultation responses to the Draft Local Plan SA Report (2012) questioned why a multi-site option had not being considered through the Local Plan and SA. It was therefore decided that an appraisal of a multi-site option would be undertaken, which would comprise a combination of the four options identified above with the minimum level of development on any one site being 300 dwellings.

3.65 An appraisal of the following five strategic development options was undertaken for Carterton against the full SA Framework using update evidence where available:

- East Carterton
- REEMA North & Central (previously 'no major new extension' option)
- Northern Extension (Kilkenny Farm site)
- West Carterton
- Multi-site

SA Objective	Options				
	East Carterton	REEMA North & Central	North (Kilkenny Farm)	West Carterton	Multi-site
1. Ensure everyone has the opportunity to live in a decent, sustainably constructed affordable home	++	++	++	++	++
2. Improve health and well-being and reduce inequalities	+ ?	+ ?	+ ?	+ ?	+ ?
3. Promote thriving and inclusive communities	+ +	+ ++	+ -	+ ?	+ ?
4. Improve education and training	+ ?	+ ?	+ ?	+ ?	+ ?
5. Maintain a low level of crime and fear of crime	0	0	0	0	0
6. Improve accessibility to all services and facilities	0 ? +	0 ? +	0 ? ?	0 ? ?	0 ? ?
7. Improve the efficiency of land use	-	++	-	-	-
8. Reduce waste generation and disposal	0	0	0	0	0

SA Objective	Options									
	East Carterton		REEMA North & Central		North (Kilkenny Farm)		West Carterton		Multi-site	
9. Reduce air pollution and improve air quality	0 ?		0 ?		0 ?		0 ?		0 ?	
10. Address the causes of climate change by reducing greenhouse gas emissions and be prepared for its impacts	0 ?	+	0 ?	+	0 ?	+	0 ?	+	0 ?	+
11. Protect and improve soil and water resources	- ?	-- ?	- ?	0	- ?	-- ?	- ?	-- ?	- ?	-- ?
12. Reduce the risk from all sources of flooding	+ ?		0		0		+ ?		0 ?	
13. Conserve and enhance biodiversity and geodiversity	0 ?		0 ?		0 ?		0 ?		0 ?	
14. Conserve and enhance landscape character and the historic environment	- ?	?	+	+ ?	- ?	?	- ?	?	- ?	?
15. Maintain high and stable levels of employment	+ ?		+ ?		+ ?		+ ?		+ ?	
16. Promote sustainable economic growth and competitiveness	+ ?		+ ?		+ ?		+ ?		+ ?	

Table 17 - Summary of SA Findings for Strategic Development Area (SDA) Options in Carterton (June 2014 and updated February 2015)

3.66 Table 18 provides an outline of the reasons for selection/rejection of alternatives for strategic development options in Carterton where relevant. It should be noted that whilst the SA findings are considered by the Council in its selection of options and form part of the evidence supporting the Local Plan, the SA findings are not the sole basis for a decision; other factors, including planning and deliverability, play a key role in the decision-making process.

Strategic Options Considered and Appraised	Reasons for Progressing or Rejecting the Option in Plan Making
East Carterton	Development to the East of Carterton is the preferred development option for Carterton. The land to the east provides sufficient space to deliver a mix of uses on site to balance the residential development with the necessary community infrastructure to support a development of the scale required to meet local housing needs. The development provides an opportunity to extend the country park and provide a buffer to Brize Norton village. Although the site is comprised of agricultural land separating Carterton from Brize Norton village and provides an agricultural setting for the neighbouring settlement, it is considered that the urban influences present in the location including the air base and the local road network reduce the landscape sensitivity of this site compared to other strategic options. The site is located in very close proximity to existing employment opportunities with sustainable access to local services and facilities in Carterton in particular, excellent public transport links to other centres such as Witney. Development in this location is clearly deliverable with the land owners and site promoters at an advanced stage in planning development on the site. It is considered that the concerns raised by local residents in relation to noise, air and light pollution can all be adequately mitigated. It should be noted that in October 2014, the District Council resolved to grant outline planning permission for 700 new homes on this site. The site is therefore identified as a commitment in the pre-submission draft Local Plan.
REEMA North & Central	Redevelopment of the former MOD housing land in the centre of the town presents the best opportunity to regenerate the town of Carterton, providing much needed housing along with improvements to the public realm and the character of the settlement. The development capacity of these sites is however constrained by the volume of land available and the presence of other uses surrounding the sites. Viability is also likely to be a consideration given the relatively high existing use value of the properties on REEMA Central rendering wholesale redevelopment of the site unlikely, with new housing more likely to come forward through a combination of 'infill' and partial redevelopment. It is therefore necessary to identify further strategic development areas on the edge of Carterton to accommodate the necessary housing growth. It should be noted that the REEMA North site has already been cleared and will shortly provide 200 new homes for service personnel. The site is therefore identified as a commitment in the pre-submission draft Local Plan.
Northern Extension	The northern extension option at Kilkenny Farm is relatively isolated from the town due to the severance created by the country park to the north,

Strategic Options Considered and Appraised	Reasons for Progressing or Rejecting the Option in Plan Making
(Kilkenny Farm site)	which provides a transition between the urban environment of Carterton and the open countryside. Development in this location is also more constrained by the rural road network which would require significant improvements to accommodate any significant growth in this location. Those improvements could in turn make these routes more attractive thereby increasing the number of cars using the rural road network. A primary concern with development in this location is that it would represent a significant incursion into the open countryside and sensitive landscape area and would form a relatively isolated and disjointed estate development beyond the urban fringe. Development of the whole site would result in significant harm to the landscape, particularly on the rising ground to the north. Whilst a reduced scale of development could potentially address the landscape concerns associated with this site, it would not address the other limitations including the relative isolation from key services and facilities. As such and on balance it is not considered that the site should be allocated at the current time in order to meet the proposed Local Plan housing target. If however the proposed Local Plan housing requirement is increased or if further sites need to be identified in order to accommodate an element of unmet housing need from another local authority (e.g. Oxford City) this option may need to be re-considered along with other potential alternatives.
West Carterton	Development to the west of Carterton would represent a significant incursion into open countryside. Unlike land to the east which is already influenced by urban elements, development to the west would intrude into what is currently a completely unspoilt area. With regard to landscape impact, the site is highly sensitive and the Council's most recent landscape assessment concludes that development to the west of the town would rank 4th out of the 4 site options considered. Although the site is relatively proximate to the Town Centre and other local services and facilities, the physical separation created by the Shill Brook, which acts as a natural barrier/edge to the town, means that the site does not integrate well with the settlement. The site boundary also includes an area of flood risk (the Shill Brook) although it is acknowledged that access can be achieved by effectively building 'over' the area at risk. There is also the potential for betterment in terms of flood risk downstream but this is not unique to this site option. As such and on balance it is not considered that the site should be allocated at the current time in order to meet the proposed Local Plan housing target. If however the proposed Local Plan housing requirement is

Strategic Options Considered and Appraised	Reasons for Progressing or Rejecting the Option in Plan Making
	increased or if further sites need to be identified in order to accommodate an element of unmet housing need from another local authority (e.g. Oxford City) this option may need to be re-considered along with other potential alternatives. It should be noted that the District Council refused outline planning permission for a scheme of 1,000 homes on this site in October 2014.
Multi-site	Reducing the scale of growth across each of the development options will be beneficial in terms of reducing the landscape impact of development, as well as reducing the threat of coalescence with neighbouring rural settlements. The scale of infrastructure required to provide reasonable access to sites, particularly to the north and west could however render development in these locations unviable at a reduced scale of growth. It is considered that there will be a trade-off between a reduced scale of growth and the delivery of infrastructure and affordable housing on each of the sites. A more sustainable approach would be to focus resources on one or two main sites to ensure that community benefits are maximised. The preferred approach at this stage is to target the bulk of residential development within one location, where infrastructure requirements are relatively modest, and where the biodiversity and landscape impact will be relatively benign, rather than distributing development in smaller groups across all development options. Whilst a multi-site option could provide the opportunity to introduce other uses on the strategic sites (e.g. employment) it is not considered that the potential benefits of this approach would outweigh the disadvantages of a multi-site option including the inability to deliver key infrastructure and affordable housing.

Table 18 - Summary of Approach to Alternatives Assessment and Selection for Strategic Development Area (SDA) Options in Carterton

Growth at Chipping Norton

3.67 Opportunities for significant expansion in Chipping Norton are relatively limited due to the landscape constraints of the Cotswolds AONB. Development at Chipping Norton is also constrained to an extent by the allocation of an air quality management zone in the town centre. The town sits astride the A44 and the A361, a heavily used lorry route passing through the town centre.

3.68 At the Preferred Approach stage (2010) land on the eastern fringe of the town was subjected to sustainability appraisal. This area lies outside the Cotswolds AONB, although the capacity for new development is constrained by the landscape character of the area.

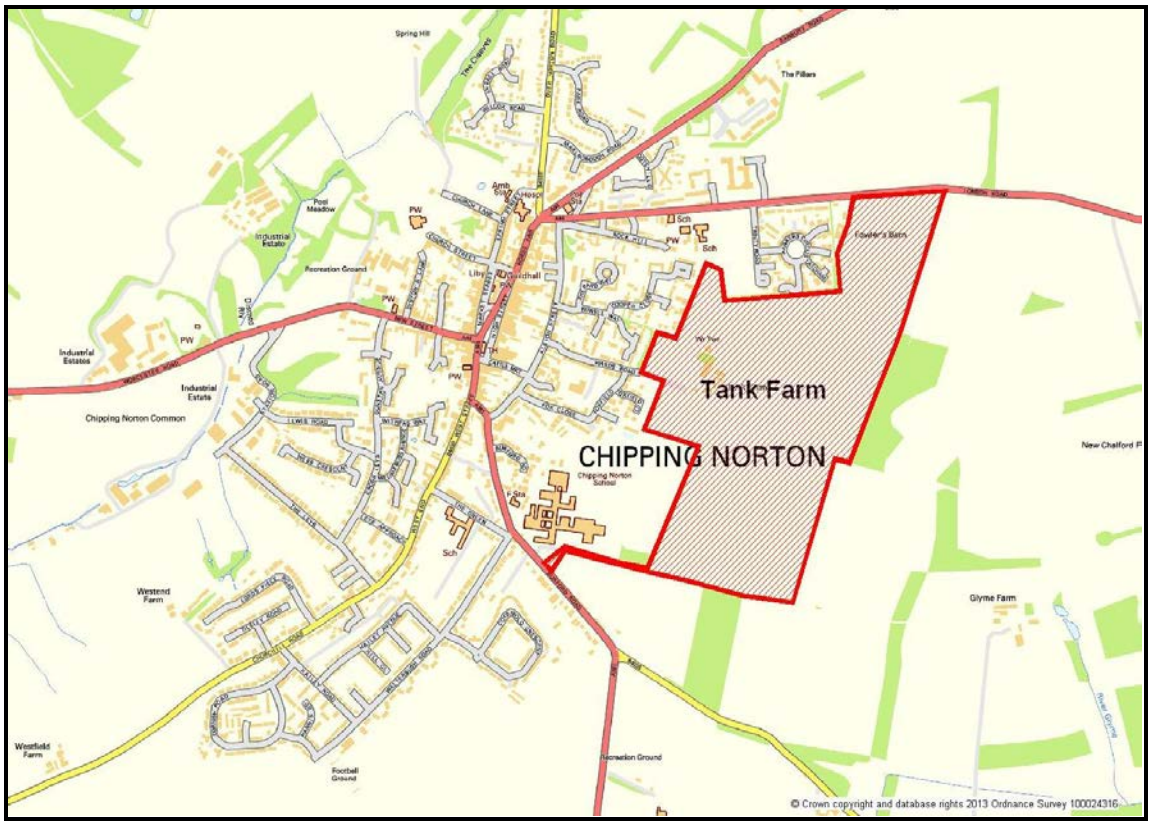

Figure 4 – East Chipping Norton Strategic Development Option

3.69 Following the publication of the Draft Core Strategy in January 2011, work had begun on a new Neighbourhood Plan for Chipping Norton. In light of this, the Draft Local Plan (October 2012) did not allocate a strategic site at Chipping Norton, rather it identified an overall number of new homes to be provided (600 in the Chipping Norton sub-area) and allowed for these to be delivered through the Neighbourhood Plan. However, since then the Town Council has clarified that it does not wish to address the issue of housing site allocations through the Neighbourhood Plan and the Local Plan must therefore provide a clear steer on future locations for growth.

3.70 In 2013 the Council announced that publication of the pre-submission draft Local Plan would be deferred until further work had been carried out to consider housing needs across Oxfordshire. A Strategic Housing Market Assessment (SHMA) was published in April 2014, which identified the overall need for housing in Oxfordshire to 2031. The findings indicated

that a higher level of housing growth is required to meet the needs of West Oxfordshire District than was previously proposed in the Draft Local Plan (2012).

3.71 The need for a higher level of housing growth and the Town Council's position in relation to site allocations through the Neighbourhood Plan made it necessary to reconsider the strategic development option in Chipping Norton. Given existing constraints, it is still considered that development to the east is the only reasonable option for strategic growth in Chipping Norton.

SA Objective	Option
	East Site (Tank Farm)
1. Ensure everyone has the opportunity to live in a decent, sustainably constructed affordable home	++
2. Improve health and well-being and reduce inequalities	+ ?
3. Promote thriving and inclusive communities	+ +
4. Improve education and training	+ ?
5. Maintain a low level of crime and fear of crime	0
6. Improve accessibility to all services and facilities	0 ? + ?
7. Improve the efficiency of land use	-
8. Reduce waste generation and disposal	0
9. Reduce air pollution and improve air quality	0 ?
10. Address the causes of climate change by reducing greenhouse gas emissions and be prepared for its impacts	0 ? +
11. Protect and improve soil and water resources	- ? -- ?
12. Reduce the risk from all sources of flooding	0
13. Conserve and enhance biodiversity and geodiversity	0 ?

SA Objective	Option	
	East Site (Tank Farm)	
14. Conserve and enhance landscape character and the historic environment	- ?	- ?
15. Maintain high and stable levels of employment	+ ?	
16. Promote sustainable economic growth and competitiveness	+ ?	

Table 19 - Summary of SA Findings for the Strategic Development Area (SDA) Option in Chipping Norton (June 2014 and updated February 2015)

3.72 Table 20 provides an outline of the reasons for selection of the east option for strategic development in Chipping Norton.

Strategic Options Considered and Appraised	Reasons for Progressing or Rejecting the Option in Plan Making
East Site (Tank Farm)	Land to the east of Chipping Norton lies outside the AONB and represents the most suitable opportunity for large-scale development on the edge of Chipping Norton. The site is available and has no significant constraints to development. The landscape impact of development can be mitigated subject to the scale of development being limited. The site is extremely accessible in relation to the town centre and other employment opportunities as well as public transport and other key services and facilities. Development of this scale also provides the opportunity to bring forward a new primary school for the town as well as potential new business space.

Table 20 - : Summary of Approach to Alternatives Assessment and Selection for Strategic Development Area (SDA) Options in Chipping Norton

Appraisal of planning policies

3.73 The development strategy and policies presented in the Draft Local Plan (October 2012) were developed and refined through previous rounds of consultation and sustainability appraisal. In order to ensure that each of these policies conform with the SA framework and that they will cumulatively deliver positive impacts throughout the district, in conformity with one another, a full sustainability appraisal of each of the policies was undertaken at the draft Local Plan stage in 2012. A summary is provided in Table 21 below.

Table 21: SA summary of impacts of Draft Local Plan policies

SA Objectives	Policies that combine to deliver cumulative/ synergistic/ indirect effects		Effects
1. Ensure everyone has the opportunity to live in a decent, sustainably constructed and affordable home	**Overall Strategy:** **Providing New Homes:** **Sustainable Economic Growth** **Environmental & Heritage Assets** **Strategy at the Local Level**	++ ++ +/- + ++	The majority of the Local Plan policies will deliver significant positive outcomes in relation to this sustainability objective, particularly the overall strategy, housing policies and the strategy at the local level. All of these policies are geared towards increasing the supply of housing and directing residential development to the most sustainable locations. The economy and town centre policies will deliver a neutral impact overall.
2. Improve health and well-being and reduce inequalities	**All Policy Areas**	++	Policies will deliver positive impacts against SA Objective 2 and cumulatively, will have significant positive implications for improving the health and well being and reducing inequalities in the district. The delivery of good quality affordable housing, the protection and enhancement of the environment and ensuring that people have accessible jobs and services are all important elements in meeting this objective.
3. Promote thriving and inclusive communities	**All Policy Areas**	++	Policies in the Local Plan will have significant positive implications for promoting thriving and inclusive communities both individually and cumulatively. The sub objectives for this element of the SA relate to tackling social exclusion, increasing the vitality of communities and improving opportunities for leisure and recreational activity and each section of the overall strategy will contribute in some way to meeting at least part of the headline objective.
4. Improve education and training	**Overall Strategy:** **Providing New Homes:** **Sustainable Economic Growth:** **Environmental and Heritage Assets:** **Transport & Movement:** **Strategy at the Local Level:**	++ + ++ + + ++	A number of policies did not relate to this sustainability objective and were scoped out of the SA process. Those policies that are relevant scored positively against the objective, particularly those that focus on strategic development areas and those relating to sustainable economic growth. These policies will cumulatively deliver significant positive results for improving education and training by delivering new educational establishments alongside residential development, by ensuring that residential development is located in close proximity to existing services and by delivering new employment with potential training opportunities.
5. Maintain low level of crime and fear of crime	**Overall Strategy:** **Providing New Homes:** **Sustainable Economic Growth:** **Strategy at the Local Level:**	++ + + +/-	More than half of the policies were scoped out of the appraisal against this objective as they were not relevant. Policy CP4 scored best against the objective as this spells out the requirements for reducing crime and fear of crime in the design of all development. The local level strategy scored neutrally against this objective as although no reference was made to community safety, it was assumed that the overarching design policy (CP3) would apply to all development in these areas.

SA Objectives	Policies that combine to deliver cumulative/ synergistic/ indirect effects		Effects
6. Improve accessibility to all services and facilities	**Overall Strategy:** **Providing New Homes:** **Sustainable Economic Growth:** **Environmental and Heritage Assets:** **Transport & Movement:** **Strategy at the Local Level:**	++ **+** **+** **++** **++** ++	The environmental and heritage assets policies have little relevance to this objective and the majority of these were scoped out of the appraisal. Enhanced Green Infrastructure provision however has the potential to improve linkages with services and facilities by sustainable means. All of the relevant policies will cumulatively deliver significant positive outcomes against this objective by improving linkages with services and facilities via a range of modes of transport and in the case of the local strategies, deliver improved services and facilities to support new development. CP 15 will help to ensure the provision and protection of local services and community facilities.
7. Improve the efficiency of land use	**Overall Strategy:** **Providing New Homes:** **Sustainable Economic Growth:** **Environmental and Heritage Assets:** **Strategy at the Local Level:**	+/- **+/-** **++** + +/-	Policies exhibit mixed scores against sustainability objective 7. Policies relating to sustainable economic growth scored well as they primarily focus on concentrating development within defined locations and the re-use of existing units. As there is a shortage of suitable previously developed land for new development in the district however, the cumulative impact of policies to deliver new housing will be that more and more greenfield land will be required to accommodate it. These policies will have a cumulative negative impact as a result.
8. Reduce waste generation and disposal	**Overall Strategy:** **Providing New Homes:** **Sustainable Economic Growth:** **Environmental and Heritage Assets:** **Strategy at the Local Level:**	++ **+** **+/-** **+** **+/-**	The cumulative impact of the Local Plan policies against this sustainability objective are likely to be neutral, with the incorporation of sustainable design and construction methods into new development (to reduce waste and encourage recycling) likely to be balanced by the overall increase in the quantum of development.
9. Reduce air pollution and improve air quality	**Overall Strategy:** **Providing New Homes:** **Sustainable Economic Growth:** **Environmental and Heritage Assets:** **Transport & Movement:** **Strategy at the Local Level:**	++ **+/-** +/- **++** ++ **+/-**	The environmental and heritage assets policies will deliver the most significant cumulative benefits against this sustainability objective as they ensure the protection of natural habitats and provide enhanced opportunities for walking and cycling, reducing greenhouse gas emissions and improving the ability of the environment to clean the air through natural processes. The policies that guide housing and economic development in the district, although neutral in most cases, have potential to cumulatively cause negative impacts against this objective, as they continue to focus the bulk of development in the main settlements where traffic congestion and air quality is already an issue. Sufficient mitigation measures are built in to ensure that existing problems aren't exacerbated where possible. Policies, such as CP24, encourage the use of sustainable transport and seek to deliver highway improvements to improve the flow of traffic.

SA Objectives	Policies that combine to deliver cumulative/ synergistic/ indirect effects		Effects
10. Address the causes of climate change by reducing greenhouse gas emissions and be prepared for its impacts	**Overall Strategy:** **Providing New Homes:** **Sustainable Economic Growth:** **Environmental and Heritage Assets:** **Transport & Movement:** **Strategy at the Local Level:**	++ **+/-** **+/-** **++** **+** **+/-**	The overall strategy and policies relating to environmental and heritage assets will deliver the most significant positive benefits against SA objective 10. The overall strategy ensures that all development is designed sustainably and that it is located appropriately so as to reduce dependency on private transport. The protection of environmental assets will maintain the ability of the natural environment to absorb greenhouse gas emission with an improved green infrastructure network better enabling species to adapt to climate change. Increasing vegetation coverage will help keep the district cool with rising global temperatures and will enable the local environment to respond to increased levels of flood risk. The neutral impacts in relation to the creation of new homes, employment development and the local area strategies are a result of the overall increase in the quantum of development and associated population increase.
11. Protect and improve soil and water resources	**Overall Strategy:** **Providing New Homes:** **Sustainable Economic Growth:** **Environmental and Heritage Assets:** **Strategy at the Local Level:**	+/- **-** **+** **++** **+/-**	The Local Plan will deliver an overall neutral impact against this sustainability objective, largely as a result of the volume of greenfield land required to accommodate new development in the district. The housing policies in particular score negatively due to the shortage of available brownfield land to accommodate such development. Such negative impacts are mitigated however by the positive scoring environmental and heritage assets policies which will ensure that development is steered away from the best and most versatile agricultural land and other natural environment assets.
12. Reduce the risk from all sources of flooding	**Overall Strategy:** **Providing New Homes:** **Sustainable Economic Growth:** **Environmental and Heritage Assets:** **Strategy at the Local Level:**	**+** **+** **+/-** **++** **+/-**	There are a number of policies within the Local Plan that have potential to increase the risk of flooding, particularly those that seek to increase the overall quantum of development in areas that have experienced past flood risk. This potential risk is balanced however by the flood risk policy and overall strategy which apply to all development in the district and ensure that all new development includes flood risk mitigation measures.
13. Conserve and enhance biodiversity and geodiversity	**Overall Strategy:** **Providing New Homes:** **Sustainable Economic Growth:** **Environmental and Heritage Assets:** **Transport & Movement:** **Strategy at the Local Level:**	+ **+/-** **+** **++** **+** **+**	The Local Plan policies score well in relation to protection and enhancement of biodiversity, largely due to the crossing cutting nature of this objective and ongoing references to biodiversity protection and enhancement through many of the policies. The housing policies score less well in relation to biodiversity due to the large volume of greenfield land required to accommodate residential development and the potential impact on habitats that this may result in.

SA Objectives	Policies that combine to deliver cumulative/ synergistic/ indirect effects		Effects
14. Conserve and enhance landscape character and the historic environment	**Overall Strategy:** **Providing New Homes:** **Sustainable Economic Growth:** **Environmental and Heritage Assets:** **Transport & Movement:** **Strategy at the Local Level:**	+ **+/-** **+** **++** **+** **+**	The landscape and historic character of West Oxfordshire are two of the key drivers for change in the District attracting people to live and work in the area and attracting visitors and investment to the District. As a result, the protection and enhancement of these assets is a key aim of the strategy and is addressed through all policy areas, to score positively against this objective. The provision of new homes scores neutrally as the majority of residential development will take place on the edge of settlements, affecting the character of both settlements and the countryside although any potential negative impacts will be mitigated through good quality design.
15. Maintain high and stable levels of employment	**Overall Strategy:** **Providing New Homes:** **Sustainable Economic Growth:** **Environmental and Heritage Assets:** **Transport & Movement:** **Strategy at the Local Level:**	++ **+** **++** **+** **+** **++**	All policy areas score positively against the objective to maintain high and stable levels of employment in the district, particularly the policies on Sustainable Economic Growth which promote further development of land for employment and support for the rural economy, tourism and town centres.
16. Promote sustainable economic growth and competitiveness	**Overall Strategy:** **Providing New Homes:** **Sustainable Economic Growth:** **Environmental and Heritage Assets:** **Transport & Movement:** **Strategy at the Local Level:**	++ **+** **++** **+** **+** **++**	All policy areas score well against the objective to promote sustainable economic growth and competitiveness in the district. The overall level of housing, including the provision of affordable housing will enable the retention of a skilled workforce and the development of modern employment spaces in sustainable locations will enable businesses to expand and provides potential to attract new businesses to the area.

3.74 As part of the iterative and on-going SA process it is important to ensure that any modifications to the Local Plan are screened for their significance with regard to the SA. Each of the proposed changes made to the Plan since the Draft Local Plan was published in November 2012 have been considered using a screening matrix presented in Appendix VI of the SA report. The screening considers if the proposed changes significantly affect the findings of the previous SA work presented in the Draft Local Plan SA Report published in November 2012. This Section sets out the summary findings of the screening work and if the proposed changes are of significance with regard to the SA.

Screening of Changes

Overall Strategy (Policies OS1 - OS5)

3.75 The changes made to these policies are not considered significant with regard to the SA as they provide further clarification or ensure consistency with changes made to other policies. The screening concluded that they do not significantly affect the findings of the Draft Local Plan SA Report (Oct 2012).

Providing New Homes (Policies H1 - H7)

3.76 One of the key changes to the Local Plan is the overall increased housing requirement set out in Policy H1, which has now increased from 5,500 to 10,500 new homes during the life of the Plan. This change reflects the updated evidence base in particular the findings of the Oxfordshire SHMA and the Council's own evidence prepared since the SHMA was published. To take account of updated evidence a fresh SA of reasonable growth options was carried out with the findings presented in the Focused Consultation SA Report (July 2014). The findings of this work are also presented in Section 4 of the full SA Report with the detailed appraisal available in Appendix IV.

3.77 The significant increase in the level of proposed housing growth has the potential to enhance the positive effects identified against SA Objectives 1 and 3 within Appendix 2 of the Draft Local Plan SA Report (Oct 2012). It is likely to increase the significance of the minor positive effect against SA Objective 2, as there will be a greater number of affordable homes delivered with the increased housing target. There is also the potential for enhanced positive effects against those SA Objectives relating to the economy as well as those relating to accessibility, equalities and health and well-being.

3.78 The increased housing requirement also has the potential to increase the likelihood and significance of potential negative effects identified against SA Objectives relating to air quality, climate change, soil and water resources, biodiversity, landscape and heritage. Mitigation provided through Local Plan policies and available at the project level should ensure that these negative effects are not significant; however, there is still an element of uncertainty until the precise location of development is known. It is important that the high quality landscape character and historic environment of West Oxfordshire is protected and that development is located in the most appropriate locations.

3.79 While the Local Plan seeks to maximise the use of previously developed land it is inevitable that the increased housing requirement will result in a greater loss of greenfield and agricultural land. This has the potential for permanent negative effects against SA Objectives 7 and 11; however, the significance of the effect is ultimately dependent on the final location of development.

3.80 An additional Policy has now been included to provide further detail to explain how the overall housing target set out in Policy H1 will be met. Policy H2 takes elements from previous Draft Local Plan Core Policies 2 and 6. Given that the policy sets out criteria for determining future proposals, including where they will be permitted, it is considered unlikely that there will be any significant positive or negative effects against SA Objectives. There is the potential for minor positive effects on SA Objectives relating to housing and the economy. The policy also has the potential for both positive and negative effects on SA Objectives relating to the natural environment.

3.81 Another new policy requires all housing developments of 100 or more dwellings to include 5% of the residential plots for custom and self-build housing. Given the nature of Policy H5 it is considered unlikely that it will have any significant positive or negative effects against SA Objectives. There is the potential for minor long-term positive effects against SA Objectives 1, 3, 15 & 16 by allowing the development of custom and self-build homes; however, there are likely to be no effects against the remaining SA Objectives. The screening concluded that the new policies do not significantly affect the findings of the Draft Local Plan SA Report (Oct 2012).

3.82 There have also been a number of changes made to Policies H3, H4, H6 and H7; however, these mainly provide further clarification or ensure consistency with national policy so are not considered significant with regard to the SA.

Sustainable Economic Growth (Policies E1 - E6)

3.83 The changes made to economic policies generally provide further clarification and are therefore not considered significant with regard to the SA. Policy E2 now includes a requirement for all development to have access to superfast broadband. This will help to reduce inequalities, improve access to education and training and have benefits for the economy. Potential to enhance the positive effects against SA Objectives 3, 4 & 16. It also provides the opportunity for more people to work from home which could have associated sustainability benefits by reducing the need to travel.

Transport and Movement (Policies T1 – T4)

3.84 The transport policy contained in the Draft Local Plan (2012) has now been split into four separate policies to provided further clarity with regard to the requirements of development and proposed highway improvement schemes. The overall transport policy (Policy T1 - Sustainable Transport) is considered still likely to predominantly have positive effects against the majority of SA Objectives, as it continues to focus development in areas with good access to services/facilities and where the need to travel by private car can be minimised. It also still seeks new development to maximise opportunities for walking, cycling and the use of public transport and minimise the impacts of vehicles. The requirement for a Transport Assessment to accompany any proposals that are likely to have significant transport implications also still remains.

3.85 Policy T2 seeks transport assessments to accompany any proposals that are likely to significantly increase traffic as well as contributions towards highway infrastructure improvements. This will help to minimise the impacts of proposed development on traffic with long-term positive effects against SA Objective 6. The policy also proposes a number of strategic highway infrastructure schemes and seeks to safeguard them. These

improvements, particularly the ones proposed in Witney, will help to address existing issues relating to congestion with the potential for long-term positive effects.

3.86 Policy T3 seeks proposed development to be located and designed to maximise opportunities for walking, cycling and the use of public transport. New development will also be expected to contribute towards the provision of new and/or enhanced public transport, walking and cycling infrastructure to help encourage modal shift and promote healthier lifestyles. This has the potential for long-term positive effects against SA Objectives 2, 6 & 10 by improving access to sustainable transport modes and therefore reducing the need to travel.

3.87 Policy T4 seeks to provide, maintain and manage an appropriate amount of off-street public car parking to support town and village centres. Given the nature of the policy it is considered unlikely to result in any significant positive or negative effects. Potential for minor long-term positive effects on SA Objectives against SA Objectives 2, 6, 15 & 16. Sufficient levels of parking will help to support businesses in the town centre as well as ensure accessibility to the services/facilities on offer for all residents.

Environmental and Heritage Assets (Policies EH1 - EH7)

3.88 The majority of the changes to these policies provide further clarification and ensure consistency with national policy. The changes help to strengthen the policies and have the potential to enhance positive effects against SA Objectives relating to health and well-being, climate change, accessibility, biodiversity, landscape and heritage.

Strategy at the Local Level (Policies WIT1 – BC1)

3.89 A number of changes have been made to the sub-area policies to reflect the increased housing requirement set out in Policy H1 as well as updated evidence. The potential sustainability effects of proposed development at the Strategic Development Areas (SDAs) has already been re-appraised through the SA. A fresh SA of SDA options was produced in 2014 and presented in Appendix V of the Focused Consultation SA Report (July 2014). The findings of this work are presented in Section 4 of the main SA Report with the detail provided in Appendix V. To take account of consultation responses and more recent evidence and analysis, a number of minor revisions have been made to the appraisals of SDA options presented in Appendix V. It should be noted that these changes do not significantly affect the findings of the SA work that was presented in the Focussed Consultation SA Report (July 2014).

3.90 A number of changes have been made to the policies relating to the Town Centres but these are considered minor and do not significantly affect the findings of the previous SA work.

3.91 To reflect the changes in the overall housing requirement there has been an increase in the number of proposed homes within each of the sub-areas. The increase in the overall level of proposed housing growth within the sub-areas has the potential to enhance a number of the positive effects identified (for previous Draft Local Plan Core Policies 25, 29, 33, 34 & 35) against the SA Framework within Appendix 2 of the Draft Local Plan SA Report (Oct 2012), in particular against SA Objectives 1, 2, 3, 6, 15 & 16. The higher number of new homes being delivered will help to meet the housing need of people within each of the sub-areas

and improve access to affordable homes. This will also help to reduce house prices in the Witney Sub-Area which is currently an issue.

3.92 It will also help to increase the vitality of town and village centres and improve accessibility to services/facilities for residents within the sub-areas. There are likely to be more improvements to transport infrastructure, including sustainable transport modes such as walking and cycling. The provision of an additional 10ha of employment land in the Carterton sub-area over the plan period will enhance the positive effects identified against SA Objectives 15 & 16 with the potential for a significant long-term positive effect. It will help to address the current imbalance of homes and jobs with the number of resident workers outweighing the number of jobs in that sub-area.

3.93 While the increased housing requirement in these areas has the potential to enhance a number of positive effects it also has the potential to increase the likelihood and significance of negative effects identified against SA Objectives relating to the natural environment. There is the potential for a greater loss of greenfield as well as best and most versatile agricultural land with permanent negative effects against SA Objectives 7 and 11. However, the significance of the effect is ultimately dependent on the final location of development.

3.94 There is also a greater likelihood of negative effects on landscape and heritage (SA Objective 14). While it is considered that mitigation provided through Local Plan policies and available at the project level help to ensure that there are no significant negative effects, there is the potential for residual long-term negative effects on landscape and heritage given the increase in housing numbers. There is still an element of uncertainty as the Local Plan does allocate only strategic sites with other sites including provision for travelling communities, to be addressed through an early plan review. The likelihood of significant effects increases in those sub-areas that contain protected or important areas, such as the AONB, and are therefore more sensitive.

3.95 A higher level of growth also means that there is greater potential for a significant negative effect on traffic, particularly within Witney, which is a key issue for a number of the sub-areas. Mitigation provided through Local Plan policies should help to reduce the significance of this negative effect. Alongside the housing development there are a number of proposed transport infrastructure improvements, which includes the West End Link in Witney. These improvements will help to address existing congestion issues, particularly within Witney and could have the potential for significant long-term positive effects against SA Objective 6. There is also the potential for sustainability benefits through improvements to sustainable modes of transport, including new and improved walking and cycling routes. This could have indirect minor positive effects on air quality and climate change.

SA of Implementing the Plan

3.96 Overall, as identified in the Draft Local Plan SA Report the implementation of the Local Plan is still considered likely to have significant positive cumulative effects against a number of SA Objectives through meeting the housing and employment needs of residents and improving accessibility to services/facilities and sustainable transport modes.

3.97 The changes made to the plan, in particular the increased housing requirement, increase the likelihood and potential significance of negative effects against a number of SA Objectives. However, as found in the Draft Local Plan SA Report (2012) it is considered that suitable

mitigation is provided through Local Plan policies and available at the project level to ensure that there are no significant effects. There is the potential for residual minor long-term negative effects on landscape and heritage as a result of the proposed increased housing requirement. A key challenge for the Local Plan is trying to meet the needs of the residents while protecting the high quality landscape character and historic environment of the District.

3.98 An early review of the Local Plan will allocate further sites to ensure that the remainder of the housing requirement is met and also take account of any unmet housing need arising from Oxford City that is 'apportioned' to West Oxfordshire through cross-boundary work that is currently ongoing. It will be important to ensure that development is located in the most appropriate locations, away from sensitive areas or designated sites of particular importance. The SA process for an early review of the plan can help to inform the selection of sites by considering the potential sustainability effects of reasonable site options and propose appropriate mitigation.

Section Four: Summary of Findings and Next steps

Findings

4.1 This SA Report considers the strategic environmental and wider sustainability effects that are likely as a result of strategic options/alternatives considered through the development of the Local Plan.

4.2 The key findings from the appraisal of strategic options for the distribution of growth carried out in 2014 demonstrated that the reasons for progression of the 'Three Towns' option are still valid. It will help to meet the housing and employment needs for the whole of the District while focussing development in the areas where it is needed most. There is the potential for negative effects on traffic, landscape and the historic environment but it is considered that there are suitable mitigation measures available to ensure that these are not significant.

4.3 The appraisal of options for the overall level of growth carried out in 2014 found that as the level of growth increases so does the likelihood and potential significance of positive effects of the Options against SA Objectives relating to the provision of housing, communities and economy and employment. Conversely it also found that as the level of growth increases so does the likelihood and potential significance of negative effects against SA Objectives relating to human health, the efficient use of land, traffic, air quality, biodiversity and heritage. An appropriate balance therefore needs to be struck between the need for more housing and the delivery of these conflicting SA Objectives. It was concluded that appropriate mitigation will be provided through Local Plan policies and available at the project level to address potential significant negative effects for the majority of SA Objectives. However, this becomes less certain as the level of growth increases, particularly for the landscape as the District has high landscape value with over a third of its area designated as an AONB.

4.4 The SA found that against the majority of the SA Objectives there is often little to differentiate between the options for strategic development in the main service centres. Development at any of the sites could provide housing, employment and community facilities along with the timely provision of necessary infrastructure with potential positive effects. As

the sites are situated on the edge of or within the main service centres they all have reasonable access to facilities/ services although some better than others. Some sites have potential barriers to movement which includes existing major roads and/ or existing natural barriers such as brooks that will need to be taken into consideration. For the majority of sites the key sustainability issues identified relate to landscape, the historic environment and the loss of best and most versatile agricultural land. A reduction in the proposed scale of development could help to reduce the significance of negative effects identified for a number of sites and this will need to be considered further through the iterative SA process as well as plan-making.

4.5 The screening of changes made to the Local Plan since 2012 found that the majority of changes provide further clarification and are therefore minor, which do not significantly affect the findings of the Draft Local Plan SA Report published in 2012. They key change to the plan relates to the increased housing requirement from 5,500 to 10,500 new homes. Overall, as found in the Draft Local Plan SA Report (2012) the implementation of the Local Plan is still considered likely to have significant positive cumulative effects against a number of SA Objectives through meeting the housing and employment needs of residents and improving accessibility to services/facilities and sustainable transport modes.

4.6 Conversely the screening of changes found that the increased housing requirement has the potential to increase the likelihood and potential significance of negative effects against SA Objectives relating to the natural environment. As concluded in the Draft Local Plan SA Report (2012), it is still considered that suitable mitigation is provided through Local Plan policies and available at the project level to ensure that negative effects are not significant; however, there is still an element of uncertainty until the precise location of development is known. Given the sensitivity of the landscape and historic environment within the District it is considered that the increased housing requirement has the potential for residual minor long-term effects against SA Objective 14 (landscape and heritage). While the Local Plan seeks to maximise the use of previously developed land it is inevitable that the increased housing requirement will result in a greater loss of greenfield and agricultural land. This has the potential for permanent negative effects against SA Objectives 7 and 11; however, the significance of the effect is ultimately dependent on the final location of development.

Next Steps

4.7 This SA Report, consultation responses received and the wider evidence base, will be used to inform the preparation of the Submission Local Plan. Any significant changes to the Local Plan as a result of updated evidence or consultation responses will be subject to further appraisal. An SA Report will accompany the Local Plan on Submission to the Government.

4.8 This SA Report is available for comments alongside the Pre-Submission Draft Local Plan for a six week period commencing in March 2015. All responses should be sent to:

Address: Planning Policy Team, West Oxfordshire District Council, Elmfield, New Yatt Road, OX28 1PB

Email: planning.policy@westoxon.gov.uk

Appendix F WODC Flood Assets

Asset_ID	Asset_Type	Asset_Sub_	Location
136576	defence	embankment	Thorney Leys, Witney.
139686	defence	embankment	Madley Park FSA.
139687	defence	embankment	Madely Park, us end FSA.
166643	defence	embankment	Field boundary to the west of the swale n
181053	defence	embankment	Ascott-Under-Wychwood, near Gypsy Lane.
181402	defence	embankment	Ascott-under-Wychwood
181933	defence	embankment	Rack End, Standlake
182102	defence	embankment	Bruern Grange.
183853	defence	embankment	Chilmore Bridge, Station Road, Eynsham,
188653	structure	screen	Rear of Cassington church. Rear of St. Pe
190993	structure	outfall	North of Shipton Under-Wychwood
191276	structure	control_gate	Eynsham Mill
191521	structure	control_gate	North of Eynsham Mill. d/s of fish farm
192041	structure	control_gate	Eynsham Mill
192044	structure	outfall	Nr Sewage Works. N of Woodstock
192045	structure	weir	280m ds. from Stratford Bridge, Stratford
192064	structure	outfall	South of Station. Charlbury
192066	structure	outfall	Nr Railway. sewerage works. Charlbury
192584	structure	weir	Cassington mill
192585	structure	weir	U/S of Cassington Mill
192586	structure	weir	U/S of Cassington Mill
192590	structure	control_gate	U/S of waterfall. NW of Bladon
192591	structure	control_gate	Pool Head. NW of Bladon
192593	structure	control_gate	150m u/s of Lince bridge. West of Bladon
192612	structure	weir	400m U/S of Ashford Mill
192851	structure	weir	Woodstock Town Watermeadow, Meadow no.5,
192852	structure	outfall	Next to Mill. Manor Rd. Woodstock
192868	structure	weir	U/S of Ashford Mill
192869	structure	weir	20m ds.of Asford Mill.
193129	structure	weir	Eynsham Mill. Eynsham
193130	structure	weir	Eynsham Mill.
193377	structure	control_gate	U/S of Eynsham Mill
193378	structure	control_gate	U/S of Eynsham Mill
193379	structure	weir	U/S of Eynsham Mill
193401	structure	weir	450m u/s of Bruern mill
193405	structure	weir	250m d/s of Bruern Abbey
193410	structure	outfall	U/S Bruern Abbey
193918	structure	weir	East of Mill House Hotel. South Kingham
194198	structure	weir	West of Church Road. Wychwood
194216	structure	weir	West of Shipton Road. Ascott Earl
194217	structure	weir	100m U/S of Langley Mill. Ascot-U-Wychwd
194218	structure	weir	250m U/S of Langley Mill. Ascot-U-Wychwd
194249	structure	weir	W of Nether Worton
194744	structure	weir	Water Lane. Charlbury
194745	structure	control_gate	Mill Field. Charlbury
194765	structure	control_gate	50m u/s of Bruern Mill
194766	structure	control_gate	450m u/s of Bruern Mill
195390	structure	weir	EYNSHAM
195785	structure	weir	D/S of Lince bridge. West of Bladon

195786	structure	weir	200m u/s of Bladon Bridge
196005	structure	control_gate	NORTHMOOR
196006	structure	weir	SHIFFORD
196009	structure	control_gate	SHIFFORD LOCK
196010	structure	weir	SHIFFORD
196795	structure	outfall	THE TANNERY BURFORD
196796	structure	outfall	US OF CHILMORE BRIDGE
197056	structure	control_gate	Rushey lock
197060	structure	outfall	North East of Grafton Lock
197064	structure	weir	Grafton complex, u/s of lock
197755	structure	control_gate	Grafton Lock, Grafton. SU 27146 99233
199178	structure	weir	SP 43970 07030
200686	structure	outfall	3m D/S of bROOK HOUSE, BRIDGE ST , BAMPT
200687	structure	outfall	D/S of Mill Bridge. Bampton
200689	structure	weir	U/S OF MILL BRIDGE BAMPTON
200694	structure	outfall	d/s of Sewage Works. Witney
200725	structure	control_gate	BROADWELL MILL.
200726	structure	weir	130m us.of Broadwall Mill.
200727	structure	weir	25m ds. of Friar's Court. South of Clanfi
200956	structure	screen	Culvert /weir by A40(T). Witney. Other si
200964	structure	outfall	Swinbrook
200966	structure	weir	GILL MILL
200968	structure	weir	D/S OF LOWER FIELD FARM
200997	structure	outfall	Witan Way, Witney. correctly located on
200998	structure	outfall	North of Langel Comm. Witney
201004	structure	outfall	LINEAR FISHERIES
201006	structure	weir	GAUNT MILL
201039	structure	outfall	CHILMORE BRIDGE, STATION ROAD, EYNSHAM.
201042	structure	outfall	B4449 South Eynsham
201251	structure	outfall	A40 WITNEY
201252	structure	outfall	A40 WITNEY
201253	structure	outfall	SOUTH OF STATION LANE - INDUSTRIAL ESTAT
201254	structure	outfall	STATION LANE BRIDGE
201256	structure	outfall	PLAYING FIELDS NORTH OF STATION ROAD
201258	structure	outfall	u/s of station lane
201260	structure	outfall	CHURCH LANE - NEWLAND
201262	structure	weir	50m u/s of Christchurch Mill
201507	structure	weir	NE OF RUSHEY LOCK
201508	structure	weir	NE OF RUSHEY LOCK
201520	structure	control_gate	Worsham source works. Worsham
201522	structure	weir	D/S OF SWINBROCK
201542	structure	weir	NW OF LITTLE CLANFIELD.
201551	structure	weir	S OF LITTLE CLANFIELD MILL.
201552	structure	weir	NEW BRIDGE MILL
201555	structure	control_gate	Woodford Mill. Burford Rd. Witney
201557	structure	control_gate	New Mill. Newmill Lane. Witney
201559	structure	weir	New Mill. Newmill Lane. Crawley
201598	structure	weir	D/S of Taynton Mill. Taynton
201791	structure	weir	Worsham Mill
201792	structure	weir	150m above Worsham Mill

201813	structure	control_gate	U/S OF LITTLE FARINGDON MILL
201826	structure	control_gate	Church Mill 50m u/s of Mill
201827	structure	weir	Church Mill, 100m u/s of Mill.
201828	structure	weir	RACK END
201832	structure	outfall	A40 WITNEY
201833	structure	outfall	PLAYING FIELDS NORTH OF STATION ROAD
201835	structure	weir	North of New Mill. Witney. - Audley, Tail
202088	structure	outfall	CARTERTON
202089	structure	outfall	Alvescot Downs Fm. Carterton
202091	structure	outfall	A40 WITNEY. U/S of Curbridge Road
202093	structure	outfall	SOUTH OF A40 WITNEY
202096	structure	outfall	Near Weavers Close. Witney
202097	structure	outfall	West end of Saxon Way. Witney
202099	structure	outfall	NEW BRIDGE MILL, opposit bank r/bank.
202126	structure	outfall	S OF LITTLE CLANFIELD MILL.
202127	structure	weir	Little Clanfield Mill
202135	structure	weir	MILL FARM BLACK BOURTON.
202136	structure	outfall	SEWAGE WORKS N OF BLACK BOURTON
202362	structure	weir	BLACK BOURTON.
202392	structure	weir	FRIARS COURT. S OF CLANFIELD KNOWN AS ROO
202398	structure	weir	NW OF LITTLE CLANFIELD MILL.
202433	structure	weir	50m u/s of Widford Mill. Widford
202434	structure	weir	D/S OF CARPARK, BURFORD
202435	structure	weir	20M D/S OF CAR PARK AT THE END OF CHURCH
202672	structure	weir	NEW BRIDGE MILL
202673	structure	control_gate	GAUNT MILL
202675	structure	weir	Gaunt Mill.
202678	structure	weir	150m u/s of Gaunt Mill. Standlake
202680	structure	weir	Gaunt Mill. Standlake
202707	structure	outfall	U/S OF THE TANNERY BURFORD
202720	structure	weir	West of Park Farm
202942	structure	weir	UNDER MILL HOUSE. N OF ALVESCOT
202943	structure	weir	MILL HOUSE. N OF ALVESCOT
202944	structure	screen	MILL HOUSE. N OF ALVESCOT
202947	structure	outfall	W CARTERTON WILLOW MEADOWS
202948	structure	screen	RAF BRIZE NORTON
202949	structure	weir	RAF BRIZE NORTON. end of aircraft runway,
203249	structure	weir	D/S LITTLE FARINGDON MILL
203262	structure	weir	Farm Mill. RB 110m u/s of Mill
203267	structure	weir	900m north of Newbridge Mill. Northmoor
203294	structure	weir	250m above mill
203296	structure	weir	150m U/S of Swinbrook Mill.
203299	structure	outfall	U/S OF WIDFORD
203301	structure	weir	U/S OF WIDFORD
203309	structure	outfall	SEWAGE WORKS, LYMBROOK CLOSE, SOUTH LEIGH
203539	structure	weir	Underdown Farm. Downs Rd. Standlake
203540	structure	weir	200m u/s of Hardwick Mill. Hardwick
203541	structure	weir	50m U/S of Hardwick Mill. Hardwick
203567	structure	weir	Brook Farm. West of Northmoor.
203568	structure	weir	Brook Farm. West of Northmoor.

203894	structure	outfall	West of Homan's Farm. South Leigh
203896	structure	outfall	SOUTH LEIGH
203897	structure	screen	BROOKHOUSE
204125	structure	control_gate	Church Mill. Downs Rd. Standlake
204127	structure	weir	Underdown Farm. 150m above Mill
204170	structure	outfall	North of Stanton Harcourt
204646	structure	outfall	ENTRANCE TO `THE GRANGE'. NW CLANFIELD.
204649	structure	outfall	ON B4020 N CLANFIELD.Black Bourton Road
204655	structure	outfall	SEWAGE WORKS. SE OF BAMPTON
204656	structure	weir	Crawley Mill. Crawley
204657	structure	outfall	East Witney
204658	structure	weir	D/S of B4047 bridge. Witney
204660	structure	weir	LANGEL COMMON
204691	structure	outfall	FILKINS MILL.
204692	structure	outfall	N OF FILKINS MILL.
204693	structure	weir	FILKINS MILL.
204735	structure	weir	NW Taynton Mill
204736	structure	weir	TAYNTON MILL
204928	structure	weir	Woodford Mills. 150m above mill
204929	structure	outfall	NW of Witney Mills. 550m u/s of mill
204931	structure	outfall	RIVERSIDE COTTAGES
204934	structure	weir	ASTHALL FARM
204975	structure	control_gate	BEARD MILL
204976	structure	weir	450m North of Beard Mill
204993	structure	weir	THE OLD MILL CONFERENCE CENTRE
205854	structure	outfall	NORTH OF SWINFORD TOLL BRIDGE
205855	structure	outfall	NORTH OF SWINFORD TOLL BRIDGE
205856	structure	outfall	NORTH OF SWINFORD TOLL BRIDGE
205857	structure	outfall	Near Works. SE of Eynsham
205858	structure	weir	NORTH EAST OF EYNSHAM LOCK
205859	structure	weir	N of The Rectory. Glympton
208192	structure	outfall	Bruern Crossing. 20M US. FROMROAD BRIDGE.
209350	structure	outfall	Pool Head. NW of Bladon
210137	structure	outfall	NE of Bruern Abbey
211283	structure	weir	SE of Manor Farm Wooton
239289	structure	spillway	Station Rd. Brize Norton.
243169	structure	control_gate	D/S OF LITTLE CLANFIELD MILL.
243171	structure	weir	LITTLE CLANFIELD MILL.
243174	structure	outfall	BROADWELL MILL.
243176	structure	outfall	ON B4020. N OF CLANFIELD.
243182	structure	outfall	SE OF GRAFTON
243183	structure	outfall	W OF GRAFTON LOCK.
243184	structure	outfall	SE OF GRAFTON.
243185	structure	outfall	SE OF GRAFTON.
243189	structure	outfall	PLAYING FIELDS NORTH OF STATION ROAD
243190	structure	outfall	PLAYING FIELDS NORTH OF STATION ROAD
243532	structure	outfall	S OF BRIGHTHAMPTON.
243878	structure	weir	MINSTER LOVELL HALL..
243880	structure	weir	U/S OF THE MILL SWINBROOK
243882	structure	weir	U/S OF THE MILL SWINBROOK

243886	structure	weir	CRAWLEY MILL, us. mill channel, left bank
243888	structure	weir	WORSHAM SOURSE WATER WORKS
243893	structure	weir	TAYNTON MILL
243913	structure	weir	U/S OF LITTLE FARINGDON MILLowner mr fent
243914	structure	weir	U/S OF LITTLE FARINGDON MILL
243915	structure	weir	D/S OF LITTLE FARINGDON MILL
243916	structure	outfall	D/S OF LITTLE FARINGDON MILL
243917	structure	weir	D/S OF LITTLE FARINGDON MILL
243919	structure	weir	SE LITTLE FARINGDON MILL
243926	structure	outfall	BLACK BOURTON
244254	structure	outfall	LITTLE FARINGDON MILL
244255	structure	weir	LITTLE FARINGDON MILL
244256	structure	weir	D/S OF LITTLE FARINGDON MILL
244268	structure	outfall	N OF ASTON
244269	structure	outfall	YELFORD
244270	structure	outfall	W OF BARLEYPARK WOOD
244271	structure	outfall	W OF MOULDEN'S WOOD
244273	structure	outfall	SW OF MOULDEN'S WOOD
244275	structure	outfall	W OF MOULDEN'S WOOD
244284	structure	weir	U/S OF A381 BURFORD
244285	structure	weir	BEARD MILL
244286	structure	weir	NW BEARD MILL FARM
244288	structure	outfall	OPPOSITE no3 RIVERSIDE COTTAGES
244289	structure	outfall	outside no 22 RIVERSIDE COTTAGES
244290	structure	outfall	WORSHAM MILL
244630	structure	weir	U/S OF LITTLE FARINGDON MILL
244631	structure	weir	U/S OF LITTLE FARINGDON MILL
244639	structure	outfall	E OF KELMSCOTT.
244640	structure	outfall	E OF KELMSCOTT.
244685	structure	weir	D/S OF LITTLE FARINGDON MILL
244993	structure	weir	THE MANOR ASTHALL
244995	structure	weir	THE MILL, SWINBROOK
244997	structure	control_gate	THE WHEEL HOUSE BURFORD
245000	structure	weir	THE MILL BURFORD
245002	structure	weir	THE MILL BURFORD
245027	structure	weir	S OF CURBRIDGE
245032	structure	weir	U/S OF ISLE OF WIGHT BRIDGE
245035	structure	outfall	NW OF KELMSCOTT
245038	structure	outfall	E OF LITTLE FARINGDON.
245039	structure	outfall	E OF LITTLE FARINGDON.
245159	structure	weir	NORTH WEST OF GAUNT HOUSE. Contact- mark
245400	structure	outfall	SW OF GRAFTON.
245424	structure	outfall	EAST OF KINGSFIELD CRESENT
245766	structure	weir	YEATMAN`S FARM. GRAFTON.
245769	structure	outfall	Langford Brook. W OF GRAFTON.
245771	structure	outfall	N OF KELMSCOTT
245772	structure	outfall	NW OF KELMSCOTT
245775	structure	weir	U/S OF A381 BURFORD
245776	structure	weir	U/S OF BURFORD
245816	structure	outfall	S OF BROUGHTON POGGS.

245817	structure	outfall	S OF BROUGHTON POGGS.
246144	structure	weir	W CARTERTON.
246145	structure	weir	W CARTERTON.
246152	structure	outfall	NW OF BLACK BOURTON
246153	structure	outfall	SEWAGE WORKS N OF BLACK BOURTON
246154	structure	outfall	SEWAGE WORKS N OF BAMPTON
246155	structure	outfall	W CARTERTON WILLOW MEADOWS
246157	structure	outfall	NW CARTERTON
246158	structure	outfall	BROOK COTTAGE BROADWELL ROAD, NR. LANGFOR
246159	structure	outfall	BROUGHTON POGGS.
246160	structure	outfall	D/S OF BROADSHIRE BRIDGE. BROUGHTON POGG
246167	structure	control_gate	U/S OF WORSHAM MILL. CONTACT JAMES JOHNSO
246170	structure	weir	SOUTH OF WILLOW FARM WITNEY
246171	structure	outfall	CARLA HOMES
246495	structure	weir	W CARTERTON WILLOW MEADOWS
246498	structure	weir	SW OF RAF BRIZE NORTON.
246499	structure	outfall	LITTLE CLANFIELD MILL.
246508	structure	outfall	Bull Street, Aston.
246509	structure	outfall	Bull Street, Aston.
246510	structure	outfall	Bampton Road, west of Aston.
246512	structure	weir	NEW BRIDGE MILL
246513	structure	screen	CHURCH MILL
246514	structure	weir	BEARD MILL, B4449
246515	structure	weir	BEARD MILL
246516	structure	weir	BEARD MILL
246521	structure	weir	HARDWICK
246913	structure	weir	off A4095 Clanfield
246917	structure	outfall	NE OF ASTON
246919	structure	outfall	NW OF COTE
246921	structure	outfall	CARTERTON.
246928	structure	weir	U/S OF THE OLD MILL CONFERENCE CENTRE
246930	structure	outfall	SEWAGE WORKS N.OF NEWBRIDGE MILL
247029	structure	outfall	EAST OF SOUTH LEIGH
247031	structure	outfall	SOUTH LEIGH
247257	structure	weir	E OF BLACK BOURTON
247258	structure	weir	E OF BLACK BOURTON
247259	structure	weir	MILL FARM BLACK BOURTON.
247260	structure	weir	MILL FARM BLACK BOURTON
247265	structure	outfall	NR CLANFIELD PRIMARY SCHOOL.
247266	structure	outfall	OUTSIDE `HOLLY TREE HOUSE' ON A4095 CLANF
247267	structure	weir	ON A4095 CLANFIELD. OPPOSITE `JAMES COURT
247268	structure	outfall	ON A4095 CLANFIELD. OPPOSITE POST OFFICE
247269	structure	outfall	ON A4095 CLANFIELD. OPPOSITE `FORGE COTT
247270	structure	outfall	ON A4095 CLANFIELD. OPPOSITE MANOR LANE.
247273	structure	weir	U/S OF LOWER UPTON FARM
247371	structure	outfall	CHIL BRIDGE ROAD. EYNSHAM.
247372	structure	outfall	CHIL BRIDGE ROAD, EYNSHAM.
247612	structure	outfall	S OF BRIZE NORTON.
247613	structure	weir	MILL HOUSE. N OF ALVESCOT
247614	structure	outfall	W OF SHIFFORD

247616	structure	outfall	NW OF COTE
247621	structure	weir	E BLACK BOURTON.
247622	structure	weir	E BLACK BOURTON.
248027	structure	weir	CROSSROAD IN CENTRE OF CLANFIELD.
248029	structure	outfall	S OF ALVESCOT
248143	structure	weir	NORTH OF EYNSHAM LOCK
248146	structure	outfall	NORTH OF SWINFORD TOLL BRIDGE
248150	structure	outfall	WEST OF FARMOOR RESERVIOR
248352	structure	outfall	SW OF ASTON
248354	structure	outfall	SE OF BAMPTON
248356	structure	outfall	SE OF BAMPTON
248357	structure	weir	S OF CLANFIELD CALLED TOP SEARCHLIGHT
248365	structure	outfall	BLACK BOURTON
248366	structure	outfall	ON B4020 CLANFIELD. AT END OF `BOURTON C
248367	structure	control_gate	LITTLE CLANFIELD MILL. SLUICE F
248368	structure	outfall	LITTLE CLANFIELD MILL
248369	structure	control_gate	LITTLE CLANFIELD MILL.
248370	structure	control_gate	LITTLE CLANFIELD MILL.
248385	structure	outfall	NORTH OF CHURCH STREET DUCKLINGTON
248386	structure	outfall	PLAYING FIELDS NORTH OF STATION ROAD
248736	structure	weir	D/S OF A381 BURFORD
248880	structure	outfall	SEWAGE WORKS, STANTON HARCOURT, THAMES WA
256193	structure	outfall	B4449 Eynsham.
257755	structure	control_gate	beard mill
259201	structure	outfall	D/S of Bampton RoadSP 28510 02008
259672	structure	outfall	SW OF RAF BRIZE NORTON
263331	structure	weir	Southof Knapps Farm. Bampton.
266600	structure	weir	The Moat House, Black Bourton.
267073	structure	weir	Northmoor lock, Nr Appleton.
267075	structure	weir	Northmoor Weir
273897	structure	outfall	Lymbrook Close,
274636	structure	outfall	u,/s of road bridge
275839	structure	outfall	
275840	structure	outfall	Rear of 55 court gardens,WITNEY
275841	structure	outfall	
278236	structure	weir	West of Glyme Close, Woodstock.
278368	structure	outfall	
282262	structure	outfall	Adjacent to downstream end of FSA
282263	structure	hydrobrake	US end of storage area. Thorney Leys, Wit
283415	structure	outfall	Madley Park FSA earth bank between fsa an
283416	structure	outfall	Madley Park FSA
283418	structure	outfall	Madley Park FSA
283772	structure	outfall	Madley Park FSA
285615	structure	weir	Bakery lane, Clanfield.
285616	structure	outfall	Black bourton Rd. Clanfield.
285966	structure	outfall	Black Bourton Rd. Clanfield.
285967	structure	outfall	Black Bourton Rd. Clanfield.
285968	structure	outfall	Black Bourton Rd., Clanfield.
286752	structure	weir	Grafton complex. 15m us of grafton weir.
289959	structure	control_gate	private garden

290426	structure	weir	Filkins Mill.
291864	structure	outfall	8m ds.r/bank, of Chilmore Bridge, Station
292740	structure	outfall	Manor Farm
292741	structure	outfall	Manor Farm
293443	structure	weir	Mill Farm.
294382	structure	outfall	field at rear of woodford mill developmen
296029	structure	outfall	
296030	structure	outfall	Madley Park
296031	structure	outfall	
296032	structure	outfall	Cogges farm, end of Church Lane, Witney.
296033	structure	outfall	Parkview Lane, Madley Park, Witney
299644	structure	outfall	Madley Park
299645	structure	outfall	Madley Park
299646	structure	outfall	Northfield farm
299647	structure	outfall	
300395	structure	outfall	
300761	structure	screen	Woodford Mill redevelopment
302016	structure	outfall	Chichester Place, Brize Norton.
302363	structure	screen	Eastfield Rd, Witney.
302526	structure	spillway	US. end of FSA, Thorney Leys, Witney.
302527	structure	outfall	ds. end of fsa, Thorney Leys, Witney
302528	structure	spillway	FSA, Thorney Leys, Witney
302765	structure	outfall	20 metyres u/s of sluice gate.
304194	structure	weir	60m us. from Moredon Lane.
306892	structure	outfall	Station Road, Brize Norton.
308062	structure	weir	Bruern Grange. Pond Bay.
308063	structure	outfall	Bruern Grange, Pond Bay.
309208	structure	spillway	Madley stream, Off Madley Way, Witney.
313845	structure	weir	Upstream of Station Road, Road bridge, Sh
314444	structure	weir	220m upstream of Woodford Mill, Witney.
317219	structure	weir	200m us from Crawley mill. Gain access to
319955	structure	screen	Burford.
320488	structure	outfall	Jet filling stn. A40 eYNSHAM.
320690	structure	screen	Yarnton Rd., Cassington.
321499	structure	weir	MINSTER LOVELL RECREATION GROUND, WASH ME
322140	structure	weir	Ashford Mill Farm.
323359	structure	outfall	Approx 42m from fp.
324061	structure	weir	NORTH WEST OF GAUNT HOUSE, SIDE DITCH. Co
324062	structure	outfall	Gaunt House. Contact-Mark Pascoe,grounds.
325384	structure	weir	Shifford Complex U/S of Weir
325386	structure	weir	Radcot Complex u/s of Radcot A
325633	structure	outfall	Opposite car prks off Witan Way, Witney.
325634	structure	outfall	WEST OXF SAILING CLUB

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