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A Appendix - Historical flooding information

A.1 South Oxfordshire District Council

SODC provided the following sources of historic flooding data:

A.1.1 Requests for sandbags / flood records

SODC records all requests for sandbags. This data was provided as two MS Word format documents;

- Master Flooding List 2000-2007 – this list identifies individual “incidents” by date, and is entitled “Potential Flooding.” Properties can appear more than once if they have multiple incidents.
- Flooding calls July 2007 – this list identifies all flooding related calls received in the July 2007 incident. The vast majority of calls requested sandbags, but it is not identified whether or not flooding occurred or if water levels reached the property.

Full addresses or postcodes were not available for the majority of these records, so it has not been possible to geo-reference them. The data should be considered indicative only of a flooding problem, for the following reasons:

1. Only includes incidents where the District Council were notified, normally to request sandbags. Very short flash floods will, in some cases, result in property flooding before a contact can be made to the local authority. In other cases, residents or businesses make their own arrangements for protecting properties.
2. No reason for flooding is recorded.
3. Incidents only indicate when flooding was thought likely to occur – in some cases water levels may not have actually got high enough to cause flooding to properties.

The records from these 2 sources were cleaned and combined into a single spreadsheet, which has been used to summarise numbers of incidents and contacts by settlement. This summary is presented in below. It is also presented in Map 8a.

Table A-1 South Oxfordshire sandbag records by settlement and year

Settlement	2000	2001	2002	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	Grand Total
Aston Tirrold	1			4										5
Benson	4	14				1	6			1				26
Berinsfield	1			2			2							5
Berrick Salome	3			1										4
Binfield Heath	1													1
Brightwell Baldwin	1			1			1							3
Brightwell Upperton	1	1												2
Brightwell-Cum-Sotwell	1					1	2					1		5
Britwell Salome							1							1
Burcot				2			2							4
Cane End						1								1
Caversham							1							1
Chalgrove	8			4			4	1						17
Checkendon							3							3
Chinnor	2						2							4
Chislehampton				2										2
Cholsey	2		1		1	1	1		1					7
Clare						1								1
Clifton Hampden	1			5			10	3						19
Crowmarsh Gifford	1			2			4					1		8
Cuddesdon							2	1	1					4
Culham	2		1	1			7							11
Cuxham	1	1												2
Denton				1	1									2

Settlement	2000	2001	2002	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	Grand Total
Didcot	14		1	1	1	5	44	11	1					78
Dorchester	4		1	3		1	7	3				2		21
Drayton St Leonard	2		1	8				3						14
Dunsden Green	1													1
East Hagbourne	1			2			2	4						9
Ewelme		4					1						1	6
Forest Hill			1											1
Garsington		1				10						2		13
Goring							20		1			3		24
Goring On Thames	6	1	3	3										13
Great Haseley		1		1										2
Great Milton				1										1
Henley-on-Thames	24	22		7	2		39	3			1	1		99
Holton		1												1
Horspath			1						1	1		1		4
Kingston Stert				1										1
Little Milton				6			2							8
Little Stoke							2							2
Little Wittenham						1								1
Long Wittenham	1			3										4
Lower Assendon		8												8
Lower Shiplake							3							3
Marsh Baldon				2										2
Middle Assendon		3												3
Moreton		1												1
Moulsford	1			2			1							4
Nettlebed			1											1
Newington	2			1			2							5

Settlement	2000	2001	2002	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	Grand Total
North Moreton	6			1										7
North Stoke	1			4			1					1		7
Nuneham Courtenay	1	2	2	3	1	6	4	2						21
Overy							1							1
Playhatch	1			1			1							3
Preston Crowmarsh	3			3	1		3							10
Rokemarsh	1						1					1		3
Sandford							20					4		24
Sandford-On-Thames	6		1	3		2								12
Shillingford	2	1		6			11	1				1		22
Shiplake							20					2		22
Shiplake/Lower Shiplake	26			15				4			1			46
Sonning Common	2													2
Sonning Eye	18			24		1	18					2		63
South Moreton								3	1					4
South Stoke	1			2			3							6
Stadhampton	3		1	4			2							10
Stanton St John	1													1
Stoke Row							1							1
Stonor		2				1								3
Sydenham	6	1	6	5			1	1						20
Tetsworth			1	1		1								3
Thame	3			6	2	1	4	1						17
Tiddington	1	1	1	1		1	1	1		1				8
Towersey	1			1			3							5
Unknown							16	1						17

Settlement	2000	2001	2002	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	Grand Total
Wallingford	5		3	10	3	1	29	1	4			4		60
Warborough	2	4					1	1						8
Waterperry			1	1										2
Watlington	1	1		1	1	1		1					1	7
West Hagbourne							1	2						3
Wheatley	2	3	2	1	2	3	4		7			3		27
Whitchurch							30					1		31
Whitchurch-On-Thames	5			8			1							14
Winterbrook	2						2							4
Woodcote				2		1	5							8
Woodeaton						1		1						2
Total	186	73	29	169	15	42	355	49	17	3	2	30	2	972

A.1.2 Flood investigations

In recent years the Councils have kept records of all flooding investigations for reporting to the LLFA. SODC provided a list of drainage/flooding investigations linked directly to property flooding since 2009. If a settlement does not appear in the table, then no investigations have been carried out.

Table A-2 Drainage/flooding investigations in SODC since 2009

Settlement	2009	2010	2011	2012	2013	Total
Benson		1	1			2
Brightwell-Cum-Sotwell			1			1
Chalgrove	2	2				4
Cuddesdon	1					1
Denton				1		1
Didcot		1		1		2
Dorchester				1		1
Ewelme		1		1		2
Forest Hill						0
Garsington				3		3
Henley-on-Thames	1		5	1		7
Horspath			1	1		2
Moreton		1				1
Nuneham Courtenay	1					1
Rokemarsh	1	1				2
Sandford				1		1
Shillingford				1		1
Shiplake			1	2		3
Shiplake/Lower Shiplake			1			1
Sonning Eye	1					1
Wallingford			1			1
Watlington					1	1
West Hagbourne		1				1
Wheatley	3			17		20
Whitchurch	1					1
Woodcote			1			1
Total	11	8	12	30	1	62

Monson have also produced several reports into flooding events or known flooding problems on behalf of SODC. The main ones are summarised below:

Flooding in the South Oxfordshire District Council Area on 3 June 2008¹

Report into flooding in Berrick Salome/Roke, Chalgrove, Kidlington, Thame, Tiddington and Wheatley on 3 June 2008. This was a severe but localised event. The source of flooding was rapid runoff from land, minor watercourses, and roads. The speed of the onset of the flooding during the day reflected the size and steepness of the local catchment in each area.

Blewbury Rd East Hagbourne, report on flooding of 20th July 2007²

Report into flooding from the Hakkas Brook at East Hagbourne. 60mm of rainfall over 9 hours on 20/07/2007 led to widespread flooding in the SODC area. 7 properties (more than half of the total flooded in the SODC area) were flooded in East Hagbourne upstream of Blewbury

¹ Monson (2008) Preliminary Report into Flooding in the South Oxfordshire District Council Area on 3 June 2008, and update report.

² Monson (2007) Blewbury Road, East Hagbourne. Flooding 20th July 2007. Preliminary Report.
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Rd. The report highlights the heavily vegetated and silted condition of the watercourse both upstream and downstream of the Blewbury Rd culvert.

Ladygrove, Didcot - Flooding - 20th July 2007³

Report into flooding from the Ladygrove Brook in Didcot to two properties, roads and gardens in the Ladygrove estate. The flooding is attributed to surcharging and backing up of the culverted Ladygrove Brook and various sewer outfalls, exacerbated by poor maintenance and blockage by silt. The report states that high floor levels protected properties from internal flooding in this instance but that only a 'slight rise' in water levels could have flooded around 200 properties.

Nuneham Courtenay Flood Alleviation Scheme⁴

A detailed report into the history and causes of frequent flooding in the village of Nuneham Courtenay over recent years. Flooding occurred in January 2003, August 2004 and, most severely, twice in October 2006, these latter events affecting 20 properties. The primary cause of flooding is identified as overland flow entering the village, bypassing the pond to the west of the village due to siltation and blockage of open and culverted drains entering the pond. The report recommends a number of immediate actions to be undertaken by riparian owners and Oxfordshire County Council, as well as additional options to improve access to the culvert in the village, increase storage at the pond and divert flows along an alternative drainage route to the south of the village. A follow up report⁵ written in February 2007 describes improvements carried out, including clearance works by Oxfordshire County Council, CCTV survey of culverts in the village and investigations into the feasibility of diverting flood flows.

A.2 Vale of White Horse

A.2.3 Flood Management Database

VOWH maintain a database of flooding incidents in the District. The MS Access Database records incidents of flooding from all sources, where the District Council have been contacted, normally to provide sandbags. Photographs are also recorded for many incidents, providing a valuable visual record of the location and extent of flooding. Records date back to 1999, so include several significant Thames catchment scale flood events in 2000 and 2003, as well as smaller scale events.

The database table of 628 incidents ("Flood Data 2") was extracted into Excel for analysis. In addition it has been Geo-referenced for display in ArcGIS. The reason for flooding field ("FloodReason") was cleaned to amalgamate similar descriptions such as "Land Drainage" and "Land Drain". The data should be considered as indicative only of a flooding problem, for the following reasons:

1. Only includes incidents where the district council were notified, normally to request sandbags. Very short flash floods will, in some cases, result in property flooding before a contact can be made to the local authority. In other cases, residents or businesses make their own arrangements for protecting properties.
2. Reason for flooding based on inspection of incident only – not verified by subsequent investigations.
3. Incidents only indicate when flooding was thought likely to occur – in some cases water levels may not have actually got high enough to cause flooding to properties.

An analysis of results is presented in Table A-3 and Table A-4:

Table A-3 Vale of White Horse flooding incidents database by reason for flooding (1999- March 2007)

Reason for Flooding	Number of reported incidents
Blocked Gully	20
Blocked Highway Drain	1
Blocked Sewer	37

³ Monson (2006) Ladygrove Didcot - Flooding - 20th July 2007.

⁴ Monson (2006) Nuneham Courtney Flood Alleviation Scheme.

⁵ Monson (2007) Nuneham Courtney Surface Water Drainage

Flash Flood	2
Groundwater	2
Heavy Rain	1
Highway Culvert	2
Highway Drainage	7
Land Drainage	112
Main River	112
Many Sources	14
Ordinary Watercourse	58
Other	64
Other Ditch	146
Pump Station Failure	1
Roadside Ditch	26
Unknown	23

Table A-4 Vale of White Horse number of incidents per property (1999- March 2007)

Number of incidents reported	Number of properties
1	322
2	83
3	26
4	3
5	4
6	5
Total	443

It is apparent that a small number of properties have persistent incidents of flooding or “near-misses.”

A summary of the contents of the database by settlement is presented below. Because OS address point does not always use the commonly recognised settlement name, some records may be miscoded against the wrong settlement. This has been noted for Botley, where the majority of address points are identified under Oxford.

Table A-5 Vale of White Horse flooding records by settlement and year.

Settlement	1998	1999	2000	2001	2002	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	Unknown	Grand Total
Abingdon	4	3	19	24	8	48		14	370	78		2		9			579
Appleton									54	19	1						74
Ardington									1	2							3
Ashbury									1								1
Baulking									3								3
Bayworth									1								1
Blewbury									5								5
Boars Hill									9	6	1			5			21
Botley									10								10
Buckland									7	1							8
Buscot									33								33
Buscot Wick									5	1							6
Charney Bassett			1						7	1	2						11
Childrey									8								8
Compton Beauchamp									1								1
Cumnor			1		1	3			3	2							10
Denchworth			1						3								4
Didcot			1												3		4
Drayton		2	1		1	4		1	4					1			14
Dry Sandford				1		2			1								4
East Challow		4	6				2		4	1	1						18
East Hanney					1	2			28	7							38
East Hendred				2					1								3

Settlement	1998	1999	2000	2001	2002	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	Unknown	Grand Total
Eaton									1								1
Eaton Hastings			2						1								3
Eynsham				1	5	2											8
Faringdon	1		2	7		1	1		14	3						1	30
Farmoor		3				4			3	1							11
Fernham			1	1					1	3							6
Filchampstead			2														2
Frilford				1													1
Frilford Heath									2								2
Fyfield							1		1								2
Fyfield Wick									1								1
Garford									1								1
Goosey				1					8	2							11
Great Coxwell	1		3	3	1	1			7								16
Grove			4			1			86	10							101
Harwell		1				1											2
Hatford									1								1
Hinton Waldrist	2	2		1	5	1			5	1						1	18
Kennington			27	1	3	21			1	2	4			1		1	61
Kingston Lisle									2	1							3
Letcombe Bassett									1								1
Letcombe Regis			4	1		1	4		12			1					23
Littleworth				1					3								4
Longcot			7	8	3	1			13	1							33
Longworth				1	1	2			4								8
Lower Radley			1			4				1							6

Settlement	1998	1999	2000	2001	2002	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	Unknown	Grand Total
Lyford			1	1		4			4	5							15
Marcham			1			3			13	4	1				1		23
Milton		1				3		3	4		1						12
Netherton				1													1
Newbridge		1	3							1							5
Oxford	8	1	11	9	5	15	2	8	1	5							64
Radley				1				1									2
Shippon				2	1	2				1							6
Shrivenham						1			3	7							11
South Hinksey			20	4		37			15	2				5			83
Southmoor			1						7								8
Sparsholt			1						7								8
Stanford In The Vale			2	5					4								11
Steventon		4	4			3			64	12							87
Sunningwell			1	8	1	2			4	1				2			19
Sutton Courtenay			10	2		12		1	2	5							32
Swinford				1		1											2
Uffington	1	7	20	1	1				10	2							42
Unknown			2	4		4		1	1								12
Upton		4							2								6
Wantage		3	6	14	1	5	2		36	3							70
Watchfield		1															1
West Challow									2	9							11
West Hanney									2	1							3
West Hendred			5						2								7
Woolstone									7								7



Settlement	1998	1999	2000	2001	2002	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	Unknown	Grand Total
Wootton		1	3	5	8				12					2			31
Wytham			1														1
Total	17	38	175	112	46	191	12	29	928	201	11	3	0	25	4	3	1795

A.2.4 Flood investigations

In recent years the Councils have kept records of all flooding investigations for reporting to the LLFA. VOWH provided a list of drainage/flooding investigations linked directly to property flooding since 2012. If a settlement does not appear in the table, then no investigations have been carried out.

Table A-6 Vale of White Horse flood investigations by settlement for 2012-2013

Settlement	2012	2013	Total
Abingdon	3		3
Appleton		1	1
Botley	2		2
Drayton	1		1
Faringdon	1		1
Farmoor			0
Fernham	1		1
Grove	1		1
Harwell	1		1
Longworth		1	1
Marcham		2	2
Oxford	1		1
Sunningwell	2		2
Sutton Courtenay		1	1
Uffington	1		1
Upton	1		1
Wantage	4	1	5
Wootton	6		6
West Challow		1	1
Total	25	7	32

A.2.5 July 2007 flood

A spreadsheet (VWHDC - July FloodedProps_Validated.xls) of properties confirmed as having flooded in July 2007 was provided. The source of flooding is not identified, but the properties are geo-referenced. Those incidents shown in Map 8a and Appendix B are only those properties where a flood grant was claimed from the Vale of White Horse, following the July 2007 flooding. This sub-set of incidents have been confirmed as having flooded, and therefore suitable for detailed mapping in the public domain, and have been added to Map 8a.

In addition, VOWH has published a report into the July 2007 flooding⁶, which analyses its response to the flooding, in particular with regards to its duties under the Civil Contingencies Act 2004, under which the Council is designated a Category 1 Responder.

A.2.6 Abingdon Land Drainage / Flood Alleviation Study (1986)

This study⁷ and accompanying flow survey⁸ covers the catchment of the Stert and its tributary the Penn Stream. The Stert rises to the north of Abingdon, but approximately 50% of the catchment is urban, alternating between open channel and culvert. It is now Main River from the A34 crossing. Several incidents of flooding are discussed, as summarised in Table A-7.

Table A-7 Historic flooding from River Stert

Date	Rainfall	Description of flooding
1913	43mm in 2 hours. Rainfall return period (from 1986 report) = 1 in 65 years.	Summer thunderstorm. 3 feet deep in Stert Street due to culvert surcharging.

⁶ Vale of White Horse District Council (2007) Official Internal Review: The Flooding Emergency 20 July – 27 July 2007

⁷ Frank Graham & Partners (1986). Land Drainage / Flood Study – Abingdon.

⁸ WRc (1986) Sewer Flow Survey Report no C93 – Abingdon (River Stert).

July 1968	Wet antecedent conditions. 60-75mm in 18 hours. Rainfall return period (from 1986 report) = 1 in >50 years.	50-60 properties flooded along open channel section (Hillview Rd to Lammas Court) Approx 24 properties flooded internally to depth of 18". Subsequent improvements made to channel.
1969	Not analysed	50-60 properties affected, but flood levels lower than 1968.
May 1983	Not analysed	Minor flooding to gardens, Northcourt Rd.
Dec 1985	Wet antecedent conditions. Rainfall return period 1 in 1 year.	Channel through Long Furlong development acted as a balancing pond. No flooding downstream.

The study recommended that a flood storage pond be constructed upstream of the urban area adjacent to the Long Furlong Farm development, which was being planned at that time. In addition, various options were identified for the culvert between Withington Court and the Thames. Options were outlined to prevent flooding in a 1 in 10 year return period event.

As an addendum to the study, Peter Dela⁹ of VOWH confirmed that the storage pond was constructed, but that in 2007 there was flooding downstream of the pond. Possible causes are increased runoff due to urban "creep" downstream of the pond, and/or exceedance of the pond design.

A.2.7 Parish Council survey

To ensure a comprehensive collection of flooding data, in particular regarding the July 2007 event, Vale of White Horse District Council requested a survey of Parish Councils containing Key Settlements. Maps showing fluvial and other sources of flooding, and a questionnaire were supplied to the Parish Councils of East Hanney, Kingston Bagpuize, Longcot, Shrivenham, Stanford-in-the-Vale and Watchfield. Table A-8 summarises the responses received in the questionnaire and in email and telephone communications.

Table A-8 Summary of flooding questionnaire results received from Parish Councils.

Source	Location of Flooding	Date of flooding	Impacts of flooding	Source(s) of flooding	Any remedial actions taken (and by whom)	Any other information
Shrivenham PC	Corner of Vicarage Rd and Longcot Rd	20/07/2007	Ground floor of house on corner was flooded internally. Road impassable.	Not known. Possible blocked road gully or incapacity in SW system.	Water company investigated 375mm SW drain through the property and found no serious blockage. No remedial action.	Flooding occurred during torrential rain. Downstream SW drainage appeared to cope satisfactorily.
Shrivenham PC	Corner of Vicarage Rd and Longcot Rd	03/06/2008	Ground floor of house on corner was flooded again internally. Road impassable.	As above	As above.	As above.
Kingston Bagpuize PC	General	20/07/2007				The large scale map agrees with the information available to the Parish Council on flooding of properties within the main part of the village - i.e. properties close to the junction of Blandy Ave and Larch Close who claimed grants from VWHDC.

⁹ Peter Dela – Discussion at project meeting, 02/10/2007.
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Source	Location of Flooding	Date of flooding	Impacts of flooding	Source(s) of flooding	Any remedial actions taken (and by whom)	Any other information
Kingston Bagpuize PC	A415/A420 junction	20/07/2007				Water levels on the roundabout at the junction of A415/A420 were much higher than indicated by this map with at least a foot of water at all entrances.
Kingston Bagpuize PC	Maybush PH, south bank of Thames, Newbridge	20/07/2007 (second flooding event in 2007).	Business out of action for several months			Site is within Flood Zone 3a.
East Hanney PC	Letcombe Brook	20/07/2007 (other incidents also reported)		Fluvial and poor maintenance of roadside ditches.		East Hanney PC has installed a flow/level monitor. Data was offered for analysis.
East Hanney PC	Letcombe Brook	Future concerns	<p>Concerns regarding increased flood risk due to</p> <ol style="list-style-type: none"> 1. The effect of surface water runoff from possible developments in Grove and Wantage. 2. the effect on the flow in Letcombe Brook from increased output in Letcombe Brook from the Thames Water Sewerage Treatment Works. (Thames Water have admitted that they have no holding facilities at their treatment works and that ' what comes in must go out'). 3. The possible effect on local drainage were a reservoir to be constructed to the north and east of East Hanney. 			
Stanford-in-the-Vale PC	General	20/07/2007 (other incidents also reported)	All roads into village were impassable.			
Stanford-in-the-Vale PC	Frogmore Brook at Bow.	20/07/2007 (other incidents also reported)	Estimated >2m deep in July 2007. Residents report regular deep flooding for past 70 years.	Fluvial	Parish council undertook clearance and dredging. Dredgings were used to create a raised bank approximately 30cm high which prevented flooding on 23/03/2007.	
Stanford-in-the-Vale PC	Property off A417	20/07/2007	Surface water flooding.	Surface water flooding.		Flooding is reported to have occurred since construction of 123 houses in c.2000. (However, VOWH report that surface water attenuation is included in the drainage system serving this development). Work on sluices on Ock have improved situation but still flooded in

Source	Location of Flooding	Date of flooding	Impacts of flooding	Source(s) of flooding	Any remedial actions taken (and by whom)	Any other information
						July 2007. Within Flood Zone 3.

Notes:

1. Locations marked in yellow have had an approximate flood outline digitised and displayed on Map 8a.
2. Views expressed are those of the Parish Councils and do not necessarily represent the views of the Vale of White Horse District Council or the Environment Agency.

A.3 Chronology of British Hydrological Events

The table below is extracted from the Chronology of British Hydrological Events (<http://www.dundee.ac.uk/geography/cbhe/>) filtered to contain events within the study area since 1800.

Table A-9 Chronology of Hydrological Events in Study Area, 1800 to Present

Year	Month	Quotation	River basin	Entry date
18 ¹⁰ 09	1	1809 January 27 According to this observer (who lived at Long Wittenham, between Abingdon and Wallingford) ".....the highest [flood] on record, caused by the sudden melting of snow, by which bridges were swept away, and much damage sustained at Maidenhead and other places"	039 - Thames	10/29/98
1821	12	1821 December 21 "nearly as high as that of 1809" according to this observer (who lived at Long Wittenham, between Abingdon and Wallingford).	039 - Thames	10/29/98
1838		1838 Thames below Oxford: "Half a mile below [Iffley Lock] comes the railway-bridge, over which the Thame and Wycombe Branch of the GWR passes, just above being the pumping station of the Oxford Sewage Works; the sewage ... is forced up by engine to the further side of the village of Littlemore, and there distributed on the farm. Passing along a broad bit of stream--the scene in 1838, in 1855, and again in 1871, of sheep being roasted on the ice-covered river - we reach Rose or Kennington Island"	039 - Thames	5/16/2000
1842	1	1842 January First notable flood since 21/12/1821 according to this observer (who lived at Long Wittenham, between Abingdon and Wallingford). Due to "a sudden thaw".	039 - Thames	10/29/98
1852	11	1852 November 16 First notable flood since January 1842 according to this observer (who lived at Long Wittenham, between Abingdon and Wallingford)". "...caused by long-continued rainfall, amounting to 5.50 inches on twenty-six previous days, after an unusually wet autumn".....[p 351 noted "After the great flood of 1852, a committee was formed, of which the late Mr Pusey was the Chairman. A report was published, stating the amount of injury inflicted by the floods, but no action was taken upon it."	039 - Thames	10/29/98
1852	11	1852 November 25 [page 198] "THE FLOODS AND INUNDATIONS. The heavy rains which have continued for more than two months have produced wide-spread destruction and loss of life. The land-waters meeting the high tides of the Thames, have flooded those parts of the metropolis which lie upon its banks. The streets on the Surrey side have been laid under water. Lambeth, Bermondsey, and Rotherhithe have been some feet under water, and the inhabitants have been driven to the upper floors, or have left their houses in waggons and boats. Great exertion was required, in many cases, to prevent the tide from rushing into the furnaces of gas-works, iron-foundaries, and breweries. The Temple Gardens were repeatedly covered. Maidenhead, Reading and Oxford have	039 - Thames	08/12/1999

¹⁰ Accessed January 2008, <http://www.dundee.ac.uk/geography/cbhe/>
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Year	Month	Quotation	River basin	Entry date
		been inundated; in the later city the gownsamen amused themselves by rowing over the meadows. At Kingston, Egham, Windsor, and Staines, the waters extended over an immense surface. The traffic on the Great Western Railway, and its branches was interrupted in many places. At Windsor, two farmers shooting from a boat, were carried away and drowned; a boy and a farm labourer were drowned. At Walton four persons were drowned by the upsetting of a beer-cooler, which they were using to ferry over to dry ground."		
1852	12	1852 December "Brooks or Bourns are known to burst forth in certain localities from the chalk stratum, which flow from time to time, and then are not seen for several years. Such are the bourns of Lambourn, in Berkshire, Assendon (near Henly) in Oxfordshire, Bourn End (near Boxmoor) in Hertfordshire ... At Assenden, the stream is as from one source; so at Lambourn; at Bourn End it rises in numerous depressions on the line of the brook ... The brooks commenced running ... on the first week of December 1852."	039 - Thames	8/19/99
1853		Quoting paper by Mr Clare Sewell Read, Farming in Oxfordshire, in Journal of the Royal Agriculture Society, vol XV (1854): "Some springs at the foot of the hills burst out in wet seasons and flow with great rapidity for months and are not seen again for years. The spring at Assenden [Assendon, near Henley on Thames], after having been dry since 1842, sent forth a very considerable stream during the chief part of last year" (1853).	039 - Thames	07/07/1999
1855		1855 Thames below Oxford: "Half a mile below [Iffley Lock] comes the railway-bridge. ... Passing along a broad bit of stream - the scene in 1838, in 1855, and again in 1871, of sheep being roasted on the ice-covered river - we reach Rose or Kennington Island"	039 - Thames	5/16/2000
1861	7	1861 July 26 Oxford: "Prior to this [7/9/1951] event on only four occasions had a fall of more than two inches in twenty-four hours been recorded at the Radcliffe Meteorological Station [including] 26 July 1861, when 2.05 in. fell without thunder being reported ..."	039 - Thames	02/07/2000
1862	3	1862 March 29 First notable flood since 16/11/1852 according to this observer (who lived at Long Wittenham, between Abingdon and Wallingford). It peaked at 4.30 p.m. on March 28th at Islip on the Cherwell, and at 4 p.m. on 29th march at Long Wittenham; "It there occupied a sectional area of 2,546 square feet, of which 1,796 square feet may be accounted flowing water, with a central surface velocity of 240 feet per minute, and a mean depth of eleven feet."	039 - Thames	10/29/98
1862	4	1862 April 11 "The flood in the Thame stream attained a greater height than during the previous period [i.e. second April peak above that of March 29, 1862], and in the main stream [of the Thames] it was about 7 inches lower where measured" according to this observer (who lived at Long Wittenham, between Abingdon and Wallingford).	039 - Thames	10/29/98
1862	5	1862 May 10 "The flood in the Cherwell, and in the extreme west, rose higher than in the former periods" [i.e. than in March or April when other spate peaks passed down the Cherwell] according to this observer (who lived at Long Wittenham, between Abingdon and Wallingford).	039 - Thames	10/29/98
1869	1	1869 January "Heavy rains in the first week of January produced considerable floods at Reading and Caversham. At Sonning and Twyford the flood swere reported as higher than for many years. A Flood at Staines was 2 feet below 1852." [Thames]	039 - Thames	06/08/1999
1871	10	1871 October 2 Rainfall observer at Wantage noted (p104) The rainfall in 10 consecutive days, between the 23rd of September and 2nd of October somewhat exceed 5.00 in ... probably without parallel for many years." [Letcombe Brook]	039 - Thames	12/11/1998
1871		1871 Thames below Oxford: "Half a mile below [Iffley Lock] comes the railway-bridge ... Passing along a broad bit of stream - the scene in 1838, in 1855, and again in 1871, of sheep being roasted on the ice-covered river - we reach Rose or Kennington Island"	039 - Thames	5/16/2000
1875	7	1875 July 23 rainfall observer at Oxford noted "Floods in the Thames and Cherwell valleys".	039 - Thames	10/26/98
1875	10	1875 October 22 Rainfall observer at Oxford noted "Floods at	039 -	10/26/98

Year	Month	Quotation	River basin	Entry date
		the highest."	Thames	
1875	10	1875 October 23/24 Rainfall observer at Reading noted "The greatest flood since 1852"	039 - Thames	10/26/98
1875	11	1875 November 15 Rainfall observer at Oxford noted "G.W. trains cannot reach here on account of the floods" [R. Thames]	039 - Thames	10/26/98
1875	7	1875 July 15-23 The diagrammatic list of flood heights for 1872 to 1894, as reached on River Cherwell at Magdalen Bridge, Oxford, shows this event to be the highest of 11 flood events in that period, reaching 185.76 feet above Liverpool Ordnance Datum. [Cherwell]	039 - Thames	11/12/1998
1875	7	1875 July Observer at Oxford (Magdalen College) noted, p99, "... Floods out from July 23rd to middle of August; depth that of an average winter flood..." [lower Cherwell]	039 - Thames	04/08/1999
1875	1	1875 January Long Wittenham, Oxfordshire: "...The January rainfall of this year here, 4.10 in, of which nearly 2.00 in fell between the 20th and 26th of that month, raised the well on which I rely 2 ft 6 in, making a total with the autumn rise of 5 ft 6 in - a fair average stock of water to be given out during the remainder of the year, with the addition of a small rise in February..."	039 - Thames	06/08/2000
1875	7	1875 July Long Wittenham, Oxfordshire: "...It might be expected that the heavy July fall here, 4.45 in, of which 3.21 in fell between the 15th and 22nd, inclusive, would have raised the subterranean stock of water considerably, whereas the water in the well only rose 1½ inches, confirming the assertion of my letter, October 31st, 1874: That it is rather the conditions under which the rain falls than the quantity falling which rules the subterranean supply. The large amount of July rain did little more than replace the evaporation and that absorbed by vegetation. The surface wells, gravel on clay, were raised about 6 inches, as might be expected."	039 - Thames	06/08/2000
1875	7	1875 July 20 "Oxford - 20th. - The floods are now over the towing path in many places, and Port Meadow is nearly covered." [ha 039, R. Thames]	039 - Thames	6/14/2000
1875	10	1875 October 9 "Long Wittenham, Abingdon: Rain fell between noon and midnight, heaviest between 2 and 3 p.m. Heavy and sudden flood in the Upper Thames" [ha 039]	039 - Thames	6/14/2000
1877	1	1877 January The diagrammatic list of flood heights for 1872 to 1894, as reached on River Cherwell at Magdalen Bridge, Oxford, shows this event to be the sixth highest of 11 flood events in that period. [Cherwell]	039 - Thames	11/12/1998
1880	2	1880 February The diagrammatic list of flood heights for 1872 to 1894, as reached on River Cherwell at Magdalen Bridge, Oxford, shows this event to be the ninth highest of 11 flood events in that period. [Cherwell]	039 - Thames	11/12/1998
1880	10	1880 October The diagrammatic list of flood heights for 1872 to 1894, as reached on River Cherwell at Magdalen Bridge, Oxford, shows this event to be the tenth highest of 11 flood events in that period. [Cherwell]	039 - Thames	11/12/1998
1880	7	1880 July 15 Oxford: "Prior to this [7/9/1951] event on only four occasions had a fall of more than two inches in twenty-four hours been recorded at the Radcliffe Meteorological Station [including] 15 July 1880, when 2.19 in. fell during a thundery period affecting the whole of southern England ..."	039 - Thames	02/07/2000
1880	7	1880 July 16 Rainfall observer at Assenton, Oxfordshire, noted p[15]: "Great thunderstorm; rainfall, 2.26 in.; water knee deep in the road." [ha 039]	039 - Thames	5/16/2000
1880	7	1880 July 16 Rainfall observer at Stonor Park, near Henley, noted p[15]: "A tremendous storm of rain (total fall, 2.35 in.), thunder and lightning between 9 and 11 pm., rivalling in intensity that of August, 1879; 35 yards of wall, 10 ft. high, knocked down, and the front of a greenhouse carried away." [ha 039]	039 - Thames	5/16/2000
1881	12	1881 December The diagrammatic list of flood heights for 1872 to 1894, as reached on River Cherwell at Magdalen Bridge, Oxford, shows this event to be the eleventh highest of 11 flood events in that period, reaching just over 184 ft above Liverpool Ordnance Datum. [Cherwell]	039 - Thames	11/12/1998
1881		1881 winter "The river below Wallingford Bridge has been dredged at an enormous cost by the Thames Conservators, and the flams and shallows cleared away. Wallingford [Chalmore] Lock no longer exists. It was in an extremely	039 - Thames	5/16/2000

Year	Month	Quotation	River basin	Entry date
		dilapidated condition for some years; in the winter of 1881, the floating ice swept away the greater part of the weir, and at last the old lock, with the little island which formed its river side, was entirely removed."		
1882	11	1882 November The diagrammatic list of flood heights for 1872 to 1894, as reached on River Cherwell at Magdalen Bridge, Oxford, shows this event to be the eighth highest of 11 flood events in that period. [Cherwell]	039 - Thames	11/12/1998
1883	2	1883 February The diagrammatic list of flood heights for 1872 to 1894, as reached on River Cherwell at Magdalen Bridge, Oxford, shows this event to be the third highest of 11 flood events in that period, reaching almost 185 feet above Liverpool Ordnance Datum. [Cherwell]	039 - Thames	11/12/1998
1883	10	1882 October The diagrammatic list of flood heights for 1872 to 1894, as reached on River Cherwell at Magdalen Bridge, Oxford, shows this event to be the fourth highest of 11 flood events in that period, just below the level reached in February 1882. [Cherwell]	039 - Thames	11/12/1998
1883	6	1883 June 20 Rainfall observer at Toot Baldon (Vicarage), South Oxfordshire, noted (p[16]) "Shortly before 1 p.m., rain and hail came down with great violence; the road between the school and Yew Cottage was impassable for the water, which stood to a great depth, and overflowed the bank of the hedge into the neighbouring orchard; the total fall for the day was 1.70 in., and .71 in. fell the following day."	039 - Thames	12/22/98
1883	1	1883 January Rainfall observer at Henley-on-Thames (Stonor Park) noted (p[34]) "A miserable, wet month; very little wheat sown, some thousands of acres flooded."	039 - Thames	12/22/98
1883	2	1883 February Rainfall observer at Henley-on-Thames (Stonor Park) noted (p[38]) "A very wet, wretched month, floods out very much...."	039 - Thames	12/22/98
1884		1884 Observer at Long Wittenham [near Wallingford] noted (p[88]) "....a well 40ft. deep, in the greensand, which has been regularly measured since 1868, was 4 ft. 6 in. lower than last year, and lower than it had been previously since 1871."	039 - Thames	11/03/1998
1884	12	1884 December Observer at Thame (Aston Rowant) noted p[89]: "During September most of the field ponds and many wells were dry, and even at the close of the year springs were giving less water than for ten years past." [R. Thame]	039 - Thames	01/05/2000
1887	1	1887 January The diagrammatic list of flood heights for 1872 to 1894, as reached on River Cherwell at Magdalen Bridge, Oxford, shows this event to be the seventh highest of 11 flood events in that period. [Cherwell]	039 - Thames	11/12/1998
1889	3	1889 March 9 Rainfall observer at Oxford (St. Giles) noted (p[7]) "High floods"	039 - Thames	11/17/98
1890	12	1890 December Observer at Assenton [near Henley] noted "Rain much below the average, and .46 in. below that of 1887; this had a marked effect on the spring water which at the close was lower than it had been for 26 years, being 72 ft. lower than at flood time in 1881."	039 - Thames	04/07/1999
1890	12	1890 December Observer at Watlington (Pyrton) noted, p[75], "... springs were very low at the end of the year, and the well had less water in it than at the end of the dry year 1887." [R. Thame headwater]	039 - Thames	8/24/99
1892	6	1892 June p[78]: Rainfall observer at Long Wittenham (Manor House) [upstream of Wallingford] noted "During the 42 years record so small a quantity of rain during the first six months of the year (6.31 in.) has never before been registered."	039 - Thames	12/10/1999
1894	11	1894 November The diagrammatic list of flood heights for 1872 to 1894, as reached on River Cherwell at Magdalen Bridge, Oxford, shows this event to be the fifth highest of 11 flood events in that period. [Cherwell]	039 - Thames	11/12/1998
1894		Wallingford Herald 17/11/1994 1894 November Wallingford Herald, quoting a century later from its coverage at that time, "Abingdon was on Thursday visited with one of the highest floods that the oldest inhabitants can ever remember. Not only were country roads flooded to a depth of three feet in place, but several urban parts of Abingdon were inundated: Stert-street, Broad-street and Ock-street being converted into a semblance of Venice. The damage to household and other property has been considerable. All the ground floor premises and offices of Messrs. Belcher and Habgood's Brewery were	039 - Thames	12/15/98

Year	Month	Quotation	River basin	Entry date
		flooded, and the Tower Brewery premises suffered a similar fate. In the lower part of Ock-street, the postman went on his rounds in a trap, and handed the people their letters in a forked stick... Early on Thursday morning the inmates of the Long Alley almshouses were alarmed to find water rushing into their homes with great force. As the level rose an alarm was raised, and in the grey light of dawn the fourteen aged people quartered in these houses, the eldest a lady of 93 years, were carried pick-a-back across to their more fortunate neighbours on higher ground in Brick Alley. By mid-day the water had started to recede, and has now nearly disappeared from the roads and pavements." [Thames]		
1894	11	<p>1894 November 20 Letter from the artist owner-occupier of "Riverside", a substantial house on Thames Street, Wallingford, with its garden forming the right bank of the Thames about 300 metres downstream of Wallingford Bridge, with an open floodplain opposite. "No doubt you must have thought of us when in your morning paper you read accounts of the great flood that has been going on in the Thames Valley for the last fortnight. It had been the highest but one of any flood during this century, the water having risen to within nine inches of a recording mark on a stone at Shillingford, put up in 1809, which was the date of the great flood that carried away the centre arches of Wallingford Bridge. I have often looked at this recording stone, in hot summer weather, with extreme incredulity, but there is no doubt, I feel sure now, as to its truthfulness. The water did not.... come into our house anywhere, except in the cellar, beneath the kitchen, where a barrel of beer was lifted off its stand and carried away to some remote corner from whence it has not yet been recovered. The width of the gravel path was all that was between the rising waters and the doors of our house, on the evening of the 15th, when the flood was at its highest; but there was a rise of another foot and a half above the path before the level of our floors could be reached, so I felt tolerably comfortable in my mind, such a further rise being almost impossible to imagine. My studio, in the cottage next door, was in greater danger, as the floor there was only six inches above the water level, and I was hard at work all Thursday morning putting such things away as might get injured upon chairs and tables; the next day I could not get to my studio at all without wading knee-deep, as the boat could not enter the narrow passage that led to the door. The flood here reached its extreme height on Thursday the 15th at 10.30 pm, at which hour it distinctly ceased to rise. No perceptible fall took place, however, until Saturday the 17th. A flood is not a noisy and terrific demonstration of the forces of nature, like a thunder-storm or a hurricane, but is has an appalling character of its own, in a quiet, stealthy, irresistible way with which the waters rise. I could not help wondering of how much use were now the new ugly iron flood-gates that have taken the place of the picturesque wooden weirs; and of what happened to the new sewage works at the various riparian towns; ours were flooded, the man holes burst open, and the sewage escaped into the river as of yore; at Maidenhead, I believe, the whole sewage outlet was entirely submerged.....As far as I have been concerned with the flood I have rather enjoyed it than otherwise, the weather, ever since the 15th, having been warm and lovely, with bright sun and moonshine, the sunrises and sunsets across the vast expanse of waters being extremely beautiful; each night the moon shone brightly, so that I could go out over my garden in the little rowing punt and enjoy the extreme beauty and novelty of the effect. The boathouse was, of course, a mere island, the water covering the floor of the little tea-room to the depth of six inches; all the things in it had to be raised on tables and ledges. The tennis-court was covered by four feet of water, and formed a lovely calm pool to boat on. I took the opportunity in my boat of clipping the top of a hedge which was rather too high to reach under ordinary circumstances..... My two eldest boys came down from town on Saturday and we rowed out across the river for quite half a mile from our house, which looked at that distance more as if it was on the banks of Southampton Water than on the Thames. It is neither difficult nor dangerous to navigate a small boat in a flood to any one</p>	039 - Thames	12/18/98

Year	Month	Quotation	River basin	Entry date
		who is a tolerable waterman, and who knows the ground well; punting is, however, out of the question, it being impossible to cross the deep stream with a pole. The best boat to use is a small fishing punt fitted with oars, as it draws little water, is easily turned, and will go anywhere. I rowed up the bridge and even through it; the view from it was very fine, the river being one vast lake right away to Streatley Hill. Yesterday, the 19th, the water had fallen rather more than four feet.....Very little damage was done by the flood in this place. The bridge had to be reached by boats from either end, as the roads to it were under water. There were some cottages near the river badly flooded; one man caught a large perch in his sitting room. I am happy to say that he was such a true sportsman that he gave the fish its liberty. But, with the exception of these cottages and parts of some road being flooded, and the overflow of the sewage into the river, Wallingford escaped wonderfully well as compared with Reading, Windsor, and Maidenhead, in which towns the damage was very great."		
1894	11	"THE FLOODS AT HENLEY - The floods in the Henley district [River Thames] are considerably higher than has been the case for more than 40 years. The "Little White Hart" Inn and the other houses by the waterside are inundated to the depth of several inches, ... The water on Thursday [15th November] was still rising, but fortunately the rain had ceased. - HENLEY, FRIDAY MORNING [16th November] The floods are still rising and the Rectory is now invaded, water entering by the front door."	039 - Thames	10/19/99
1894	11	"WALLINGFORD - THE FLOODS - The heavy and continuous rains have again increased the flooded state of the Thames in this district. The water during Monday night [12th November 1894] rose 16 inches.- The river continued to rise on Thursday, the flood being the highest within living memory, and the scene from the bridge has been witnessed daily by hundreds of spectators. At the Crowmarsh end the water flows in a stream down the village street, the pathway being three inches deep in water. At the town end the water covers the road from the "Town Arms" to the Oxford Canal Wharf, the wharf premises being a sheet of water, and a punt having to be used, the stream coming in at the front door. At Mr Cornesby's landing stage at the lower wharf, the water has entered the house, and several of the houses in St Leonards-lane adjoining are flooded. In Winterbrook the water is in the road up to the axle-trees of vehicles, and one or two boat houses in this direction have been washed away. The water mark on Thursday [15th November] at mid-day was four inches higher than the great flood of 1875."	039 - Thames	10/19/99
1894	11	"FARINGDON. - HEAVY RAINS AND FLOODS - The heavy and incessant rains of Sunday night, and Monday and Tuesday nights and Wednesday [11-14 November], have caused severe floods in the Thames Valley, and have blocked the roads in several places interfering in some instances with the passage of the mail carts. At Buckland, the main road to Bampton has been rendered impassable by the bursting of a culvert carrying a river cutting under the road. In some places in the town the water has made inroads into the houses, especially at the extreme end of Southampton-street." [The road from Buckland to Bampton crosses the Thames at Tadpole Bridge, but there are also a number of channels running parallel with the Thames and it appears to be one of these that burst a culvert]	039 - Thames	12/05/1999
1894	11	"THE FLOODS AT WANTAGE - For the first time for many years Wantage on Wednesday [November 14th] was flooded in various parts, owing to the heavy rains of the last fortnight and particularly those of Tuesday night and Wednesday morning. The brook which rises at Letcombe and passes through the town was early on Wednesday quite full, and as the rain continued to fall it soon began to overflow its banks on its way through the town. By ten o'clock the water had risen to a depth of several feet by the side of the stream, and soon began to find its way into Mill-street, which in a very short time became flooded to a depth of three or four feet for a distance of 200 yards. The houses on either side were flooded with water, and most of the inhabitant sought shelter in the upper	039 - Thames	12/05/1999

Year	Month	Quotation	River basin	Entry date
		rooms. In Messrs. Clark and Sons' mill there was a depth of three feet of water, and the lower floor being packed with corn the damage done was very great. The pavement just outside the mill, where the water came rushing down a narrow passage with great force, were [sic] entirely washed away, and deep holes were made in the ground. In Mr. Collins' bakehouse the water was several feet deep. Stables became filled with water, and a good number of cattle had to be removed. In Lock's-lane some of the houses had a depth of nearly four feet of water, and the inhabitants had to take shelter with their more fortunate neighbours. In Wallingford-street, also Stirling's house, several homes suffered from the effects of the floods, and near the Ham and at the bottom of Grove street, floods were also to be seen. Towards evening on Wednesday the water began to decrease and the road which had all day been like a river, became passable. ... Large sheets of water lay on the tramway line and near Oxford-lane [in Grove], so strong was the current rushing across the horse road and over the metals that it was deemed advisable not to cross with the engine and cars, horses and traps being therefore used to convey passengers over. The villages around Wantage, particularly those in the low-lying districts, appear to have suffered considerably. A large quantity of land is now under water."		
1894	11	"THE RECENT FLOODS AT CAVERSHAM - ... A correspondent who ... drove through the flooded district of Lower Caversham on Saturday afternoon [17 November 1894], ... sends us an amusing description of his experiences ... On starting, as soon as we were under the railway bridge in Caversham-road, we were in the thick of it, and we could not tell for the life of us whether we were afloat or ashore. ... Then came the bridge (Caversham Bridge), and our horse shook the water from his hoofs. As far as one could see the river seemed to have swept everything away that it had not covered up. Houseboats, slipped from their moorings, were resting in tree-tops. The heads of pollard willows appeared to be floating at anchor on the water. A launch in the rear of Bona's Hotel lawn had been carried 40 yards behind the tow-path. The rails along the towing-path, four feet high though they are, were a line of black dots that sometimes peeped above the water and sometimes became invisible. ... The new house built by Mr. Freebody below the bridge stood in three feet of water. It was a new experience for us to climb up the hill and be on terra firma once more. As we drove along the high road it seemed as though all the earth had been submerged except the hill near Queen Anne's School (formerly Amersham Hall) on which we were. Between Play Hatch and the Great Western railway at Reading lay an endless sheet of water, broken only here and there by protruding trees and the roofs of ruined sheds. Every meadow was a water-meadow. The water meadows themselves were water. Down below us lay Caversham. the streets between its red-brick cottages each a streak of monotonous brown. The crowded district that comprises Gosbrook-road, Piggott's-road, Coldicutt-street, King's-road, Queen's-road, and Gosbrook-street, &c., was flooded from end to end. We drove through it a few minutes later. Our horse staggered as the swift current near the Caversham Laundry in Queen's-road and George-street almost carried him off his feet. ... Everywhere the same scenes of moist discomfort were repeated and we really felt a sense of relief at reaching Reading once more. We paused on our way to look at the to take a look at the cattle market in Great Knollys-street, three feet below sea-level on the ground floor. We found that the cattle sellers had transferred their industry to St. Mary's Butts, where Saturday's cattle market was held, and had left their market to the mercy of the waters." [Thames]	039 - Thames	4/17/2000
1894	11	"The floods at Henley last week [11-17 November 1894] were the highest of any on record since 1809 and the height was but 11 1/2 inches under the stone (set in the wall of Mr. Harvey's cottage at Riverside) whereby the record of the 1809 flood is preserved."	039 - Thames	4/17/2000
1894	11	"THE FLOODS AT GORING - At Goring [on Thames] as elsewhere, the floods have been most disastrous. On	039 - Thames	4/17/2000

Year	Month	Quotation	River basin	Entry date
		Thursday night in last week [15th November 1894], when the water in the Thames reached its highest rise, it was 11 feet above the ordinary summer level. It remained at this height until 2 o'clock on Friday morning, the 16th inst., when it began gradually to subside. Yesterday (Friday [23rd November]) morning the river was about level with the towing-path below Goring bridge, but above the Lock the land is still all submerged. ... The floods rose so high on Saturday and Sunday [17th & 18th November], that Goring Church and the churchyard were inundated ; and at one time there were nearly nine inches of water in the basement of the church tower and the vestry."		
1894	11	1894 November p130: "The New Inn, Shillingford, [South Oxfordshire] circa 1912. The inn was located on the main Oxford Road. In 1894 flood-water reached a depth of 3 inches in the bar..." [ha 039]	039 - Thames	07/11/2000
1896	7	1896 July 7/8 p[11] "Serious flooding occurred through thunderstorm rains, notably at Faringdon, Leicester, Grantham, Rhyl..."	039 - Thames	04/12/1999
1899	8	1899 August 15 Rainfall observer at Wallingford (Castle) recorded 3.10 in. rain, the highest total in the country this day [Thames]	039 - Thames	11/03/1998
1899		1899 Observer at Henley (Henley Park), reviewing the year, noted p[91]: "A year of serious drought. Water had to be hauled for cattle for the last five months"	039 - Thames	12/17/99
1900	2	1900 February Rainfall observer at Oxford (St Giles) noted (p[43]) "The floods were the heaviest since 1894."	039 - Thames	11/26/98
1901	7	1901 July 24/25 Rainfall observer at Oxford (St Giles) noted, p[17], "Rain 1.65 in. and 1.55in. respectively with thunderstorms. Rain began before 6 a.m. on 23rd, and by 1 p.m. on 25th two inches had fallen... On both days basements were flooded all about the town."	039 - Thames	06/10/1999
1902	12	1902 December Rainfall observer at Abingdon (Culham) noted in February 1903 "The springs were never known to be so low as they were the end of 1902. Of the past five winter months the rainfall of three was below the average, and of two above. It always requires 10 inches from October to February under such conditions to affect the deeper wells, and just ten inches fell in that period."	039 - Thames	10/14/98
1903	6	1903 June Rainfall observer at Abingdon (Culham) noted "Very high floods in the middle, unprecedented for the summer, and only about 2ft. 2 in. below the great flood of November 1894."	039 - Thames	10/14/98
1903	6	1903 June 15 Oxford: "Prior to this [7/9/1951] event on only four occasions had a fall of more than two inches in twenty-four hours been recorded at the Radcliffe Meteorological Station [including] 15 June 1903 when 2.01 in. fell during a three day spell of rain associated with a depression ..."	039 - Thames	02/07/2000
1904	2	1904 February 18 Rainfall observer at Wantage (Ardington) noted (p[29]) "Excessively damp till 18th, the ground, even on high levels, being so saturated with water that springs rose in all directions, breaking through the macadam on the roads..." [Letcombe Brook]	039 - Thames	12/09/1998
1904	2	1904 February 3 Rainfall observer at Oxford noted (p[5]) "The meadows completely flooded, the Thames and Cherwell forming a vast lake for miles above and below the city." [Cherwell]	039 - Thames	12/10/1998
1904		1904 p78 caption on photograph from Wallingford Bridge: "The 1904 flood before it reached its peak, photographed by A.J.Latter. Note there are no steps from the bridge roadway to the riverbank; these weren't built until 1909." [ha 039]	039 - Thames	07/11/2000
1907	6	1907 June 1 Rainfall observer at Oxford (Banbury Road) noted, p[13], "Severe thunderstorm commencing at about 4 p.m. The lightning was incessant and vivid, and the rain and hail were appalling. In 20 minutes 1.10 in. fell, and the St Giles and Banbury Road had water over the footway and up to the tram-lines most of the way. At one time the water stood level with a bank about 9 inches high on the lawn. Half an hour after the rain had ceased hail stones were still lying on the grass."	039 - Thames	04/07/1999
1908	4	1908 April 27 "...a recollection exists of an unseasonable blizzard on 27 April 1908, which filled some parts of the roads hedge-high. In the sudden melting of the snow and the resultant outrush of water down Hollandtide Bottom, a flood	039 - Thames	12/10/1998

Year	Month	Quotation	River basin	Entry date
		came pouring right through the Chequers [inn, Berrick Prior, Oxfordshire] [Thames trib.]		
1909	10	1909 October 31 Rainfall observer at Goring noted p[50]: "The month in its wet dreariness surpassed anything the living have experienced here. Including the last 8 days of September rain fell on 36 out of 39 days." [ha 039]	039 - Thames	6/22/2000
1910	6	1910 June 9 Rainfall observer at Kidmore End School [Chilterns, between Wallingford and Reading] noted (p[17]) "Thunderstorm accompanied by tropical rain, 4.90 in. of rain falling in an hour between 12.30 and 1.30p.m. The roads were flooded in an incredibly short time, roots were washed out of the ground, and in two fields on a slope the soil was washed into the valleys. The water made a track several yards wide through a cornfield where no water had ever been known to flow before." The editor of British Rainfall noted (p[118]) about this event "The storm which fell upon the Reading area about noon on the 9th yielded just over 3 inches in Caversham, ... so that while several of the streets were converted into rivers in the northern and western parts of the town, there was comparatively little rain in the east and the south. At Kidmore End School the rain gauge .. measured 5.51 in.; but the pattern of the gauge was so defective, consisting .. simply of a 'funnel in a bottle', that it is impossible to accept it as accurate..."	039 - Thames	11/20/98
1912	8	1912 August 30 Observer at Faringdon noted, p[21], "River Isis below Faringdon in flood" [upper Thames]	039 - Thames	8/23/99
1913	4	1913 April 12 Rainfall observer at Abingdon (Donnington) noted (p[12]) "Exceedingly heavy rain during a thunderstorm; 1.78 in. of rain fell in a little over an hour. It caused a flood in the town to a greater extent than had occurred before during the memory of any living inhabitant. Great damage was done to agriculturalists and gardeners." Observer at Abingdon (Caldecott) noted "2.12 in. fell in five hours."	039 - Thames	1/19/99
1922	8	1922 August 6 Oxford: "Prior to this [7/9/1951] event on only four occasions had a fall of more than two inches in twenty-four hours been recorded at the Radcliffe Meteorological Station [including] 6 August 1922, during an exceptionally wet month, when 2.79 in. fell ..."	039 - Thames	02/07/2000

A.4 Internet search

An internet search was carried out for references to flooding in the Districts beyond those already listed above, or identified on EA historic and Flood Zone Maps. The web sites queried were:

www.heraldseries.net

www.henleystandard.co.uk

www.thametoday.co.uk

www.thameswater.co.uk

<http://news.bbc.co.uk/1/hi/england/oxfordshire/default.stm>

www.oxfordshire.gov.uk

A summary of the flood events about which information has been gathered from the internet is given in **Error! Reference source not found.** This should not be considered a comprehensive list and there may well have been more events, particularly pre 20th century. Historic flooding information is summarised on Map 8a.

Table A-10 Summary of flood events from internet search

Location	Type	Date	LA	Source	Comments
West Way	Foul Sewer	Various	VOWH	http://www.thameswater.co.uk/UK/region/en_gb/content/news/news_000814.jsp	
Stockham Way, Wantage	Urban drainage	14/09/2006	VOWH	http://www.heraldseries.net/search/display.var.922501.0.flash_flooding_hits_county.php	Fire-fighters called. "blocked drains overflowing"

Location	Type	Date	LA	Source	Comments
Sutton Courtenay	Not identified	14/09/2006	VOWH	http://www.heraldseries.net/search/display.var.922501.0.flooding_hits_county.php	Oxford Times received report of flooding
Main Street, West Hanney	Not identified	20/07/2007	VOWH	http://www.heraldseries.net/search/display.var.1564487.0.hanney_flooding.php	
Church Street, Radley	Not identified	20/07/2007	VOWH	http://www.heraldseries.net/search/display.var.1558571.0.flooding_thousands_suffer_flood_misery.php	Flooding affected road access.
All roads around Uffington	Not identified	20/07/2007	VOWH	http://www.heraldseries.net/search/display.var.1558571.0.flooding_thousands_suffer_flood_misery.php	Flooding affected road access.
Station Road, Shiplake	Urban drainage	2005	SODC	http://www.henleystandard.co.uk/archives/2005/200505/news/story16.htm	Highway drainage issue
High Street, Thame	Urban drainage	06/08/2004	SODC	http://www.thametoday.co.uk/news/Storm-chaos.835233.jp	Flooding to Woolworth's, Falcon Pub, Martins, Boots and other properties.
Assendon Stream, Henley	Groundwater flooding	2000/2001	SODC	http://bixandassendon.org.uk/placesofinterest7.htm	Property and road flooding along Fair Mile for extended periods.

Rows highlighted in yellow are mapped on Map 2. Other locations did not contain sufficient information to be mapped with sufficient accuracy.

A.5 Other sources of flooding data

A few other events were identified in project meetings. These are summarised in Table A-11.

Table A-11 Summary of other flooding history

Location	Type	Date	LA	Source	Comments
Botley Road	Fluvial (Main River)	Jan-03	VOWH	Project meeting, 02/10/2007	
Kingstone Winslow	Surface Water	To be confirmed	VOWH	Project meeting, 02/10/2007	
Longcot	Surface water/sewer	Various	VOWH	Flood report by Parish Council	
Larkhill Stream, Abingdon	Fluvial flooding	20/07/2007	VOWH	Lt. Col. Andrew Douglas, Bursar, School of St Helen & St Katherine.	

Rows highlighted in yellow are mapped on Map 2. Other locations did not contain sufficient information to be mapped with sufficient accuracy.

A.6 Didcot

Didcot was the subject of a separate SFRA, carried out in 2007 by HR Wallingford. This study gathered evidence from local historian Brian Lingham, local residents and councillors, newspaper reports, sandbag records and FRA reports. All of the information (apart from the FRA reports) has been summarised on Map 8b. Figure A-1 shows a newspaper photograph of flooding of the Moor Ditch.

Railtrack was also contacted, regarding any incidences of flooding associated with the railway embankment that runs from east to west through Didcot. The only record they had was associated with runoff from the embankment near the Steventon level crossing, which required some drainage maintenance. This was borne out by comments from Harwell PC and associated landowners, who had no records of flooding associated with the A4130 link road

through the main part of the study area, although it was noted that this depended on keeping the two main tributaries clear through the road and rail embankments.

Map 8b shows the approximate areas mentioned by Brian Lingham in his historical review. In order to retain clarity, the large area of marsh to the north of the town, associated with the flatter land of the Thames floodplain has not been shown. The other areas are associated with specific topographical features, such as the runoff from the slopes to the east (Hagbourne Marsh), which is also associated with the flooding under the old Marsh Bridge which features in many of the newspaper reports. Marsh Bridge is a major low spot in the terrain and it is believed that this is because it lies on an old course of the River Thames.

In addition to the historical flood areas, the media reports have been summarised as a series of histograms which gives a qualitative view on how the incidence of flooding has changed in the major 'hot spots' within the study area. The distribution of the media reports is across most areas of Didcot, although pre-1970 flooding is almost entirely associated with the area north of The Broadway and around the top of the Ladygrove Brook. Apart from Marsh Bridge, the areas that flooded before 1970 do not suffer in the more recent decades, possibly indicating that the causes were removed.

It is the period from 1970 to 1990 when most parts of Didcot suffer some flooding. The only areas, that do not appear to suffer in this period, are around the railway station (area 10 in Map 8b), West Hagbourne and the area around the Moor Ditch to the east of the Power Station (area 8). This general incidence of flooding is probably related, at least in part, to the growth of the town. After 1990, the key areas that have been recorded to flood are the industrial areas to the east of the Power Station and the A4130, and in West Hagbourne. The first area (area 8) is associated with the floodplain of the Moor Ditch, and is probably related to the newer development both in this area and at Milton Park upstream, which may have produced higher runoff from impervious areas. One of the FRA reports indicates that flooding may also be due to blockage of culverts by debris, since hydraulic modelling does not indicate a flooding risk. It is not clear why West Hagbourne (areas 3 and 4) should experience greater flooding over the past 15 years, since this is very much a rural area situated in the headwaters of the Hakkas Brook. Changing farming practices could have resulted in increased runoff from the surrounding land, or possibly a reduction in groundwater abstraction could have raised the water table, and with it a faster response to heavy rainfall. The view of John Townsend and another local resident is that the farming practice has changed, with the farmer not ploughing as deep. As a result, the land has become more compacted and water tends to accumulate on the surface rather than infiltrating into the ground.

There are some records of sandbags being handed out, with data only available since 2000. These confirm the vulnerable area in East Hagbourne, and isolated areas to the north of The Broadway. Sandbag data is more comprehensive from VOWH, which shows many occurrences in Steventon, around the Ginge Brook, and at locations in Milton and near the top of the Moor Ditch, where it is known that there is marshy ground in the field adjacent to the A34.

It has to be remembered that newspaper reports are almost certainly going to be concerned with flooding that affects housing or infrastructure, such as roads. Therefore flooding may well take place along the tributary of the Moor Ditch to the west of Didcot, but due to the absence of dwellings and roads, this would not feature in any media reports. For these areas, the presence or absence of a flood risk can only be obtained from the hydraulic modelling, or from first-hand experience of the landowner.

In terms of the source of the current or past flood risk, that associated with West and East Hagbourne appears to be totally related to Hakkas Brook and therefore of a fluvial nature. Flooding in Lake Road (area 5) is due to blockage of a culvert under the disused railway embankment, which causes water from south Didcot to flow over the ground surface through the embankment opening. This is a known flooding 'hot spot'. Fluvial causes also apply to the recent flooding of the industrial area around the Moor Ditch to the east of the Power Station.

Incidences of flooding in Steventon are almost certainly of fluvial nature, due to the larger catchment area upstream of the village. There is no information in the records collected to date which indicates that any of the flooding is due to high groundwater levels.

For the other areas in Didcot it is difficult to determine if this is due to pluvial flooding (excessive rainfall falling on low-lying, impermeable ground), or linked to surcharging of the

surface and/or foul drainage system. Whilst some of the records do indicate a link to the sewer systems, improvements over the past 20 years or so may well have removed many of the problems. Flooding in area 1 was due to poor sewerage that was installed in the 1960s, some of which was known to have collapsed. This is also associated with an historic watercourse, and so water may also accumulate along the lower ground. Area 2 is also associated with an old drainage path where water accumulates. Ponding does occur along the fields on the road to Harwell, partly because there is limited connection with the drainage ditches that run along the field boundaries.

Flooding at St. Birinus School (area 7) was due to poor drainage, but this has now been rectified. Area 9 is linked with Lydalls Close, which has not been adopted, and so has limited surface drainage, and has suffered in the past. Flooding on the east side of the Ladygrove estate (area 6) results from runoff from the steep slopes of Hadden Hill, and an incomplete drainage system which doesn't appear to link in effectively with the Ladygrove Brook. Flooding in the west of the estate, to the east of the railway line is linked to poor drainage of the ditch along the railway embankment, which also gets backed up from the Moor Ditch when this is in flood.



Figure A-1 Newspaper photograph illustrating flooding of the Moor Ditch floodplain

B Potential development area flood risk summary sheets

B.1 Introduction

The following sections include summaries for each strategic site and key settlement in Vale of White Horse and South Oxfordshire Districts.

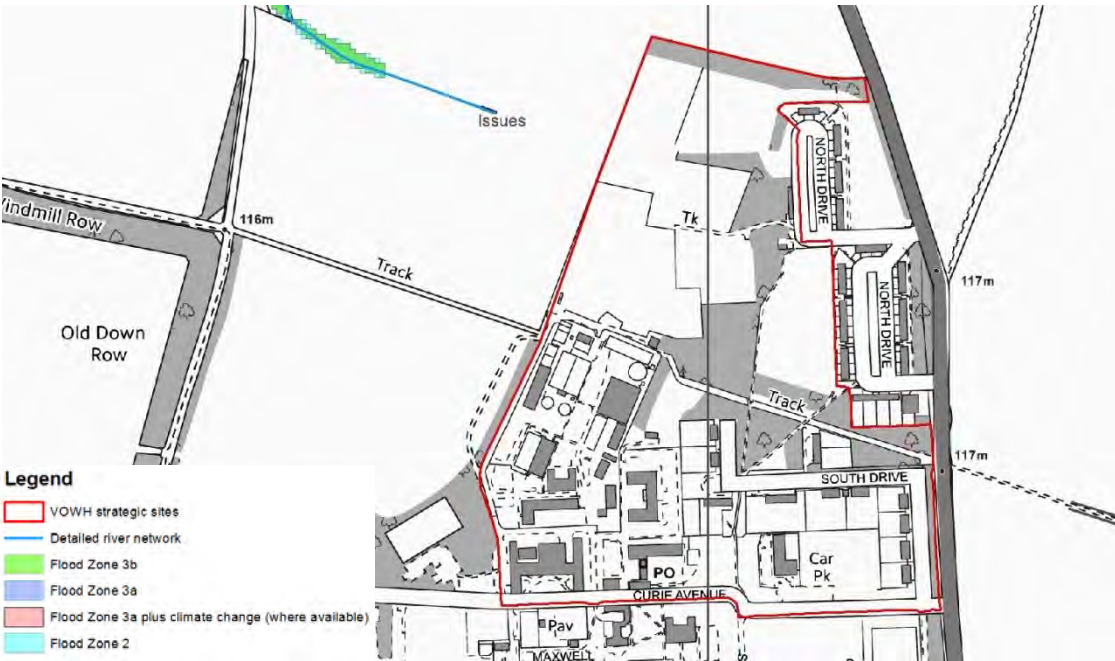
The information given is based on national and detailed mapping provided by the Environment Agency, and local evidence provided by the Councils.

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

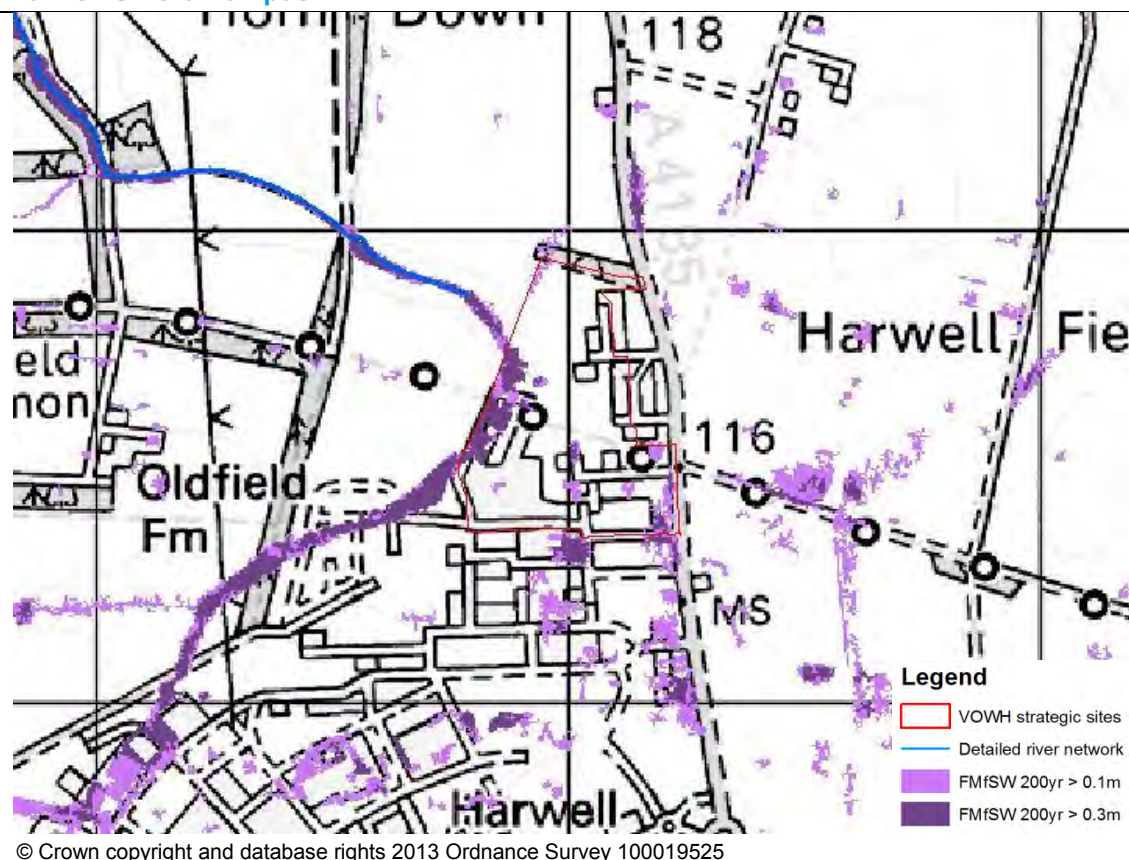
- Flood Zone 3a and Flood Zone 2 are based on the national mapping provided by the Environment Agency.
- Flood Zone 3b is based on the 20 year flood extent where there is detailed model information. Where no detailed information is available, Flood Zone 3a is used as a precautionary approach.
- Flood Zone 3a with climate change is based on the 100 year plus climate change flood extent where there is detailed model information. Where no detailed information is available, Flood Zone 2 is used as a precautionary approach.
- The Flood Map for Surface Water (FMfSW) is shown on a 1:50,000 map background at a 1:10,000 scale (or smaller), as stipulated by the guidance notes provided by the Environment Agency. For clarity, only the more severe 1 in 200 year event has been shown.
- The Areas Susceptible to Groundwater Flooding (AStGWF) map is very broad-scale and has not been shown for individual sites. It can be viewed in Map 6.

B.2 Vale of White Horse - Strategic sites

B.2.1 Harwell Oxford Campus, Harwell

Harwell Oxford Campus			
Area: 17.8ha	Brownfield/greenfield: Both	Proposed use: Residential - up to 400 houses	Flood risk vulnerability classification: More vulnerable/less vulnerable
Summary of flood risk to site			
<p>Fluvial There is no known risk from fluvial flooding. There are no flood defences.</p> <p>Flood Zone map</p>  <p>© Crown copyright and database rights 2013 Ordnance Survey 100019525</p>			
<p>Surface water The FMfSW shows a potential flow path shown to west edge of site, and other small areas of ponding. No local evidence to support this.</p> <p>Flood Map for Surface Water (200 year)</p>			

Harwell Oxford Campus



Groundwater

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

Sewer

No known sewer flooding problems.

Effects of climate change

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

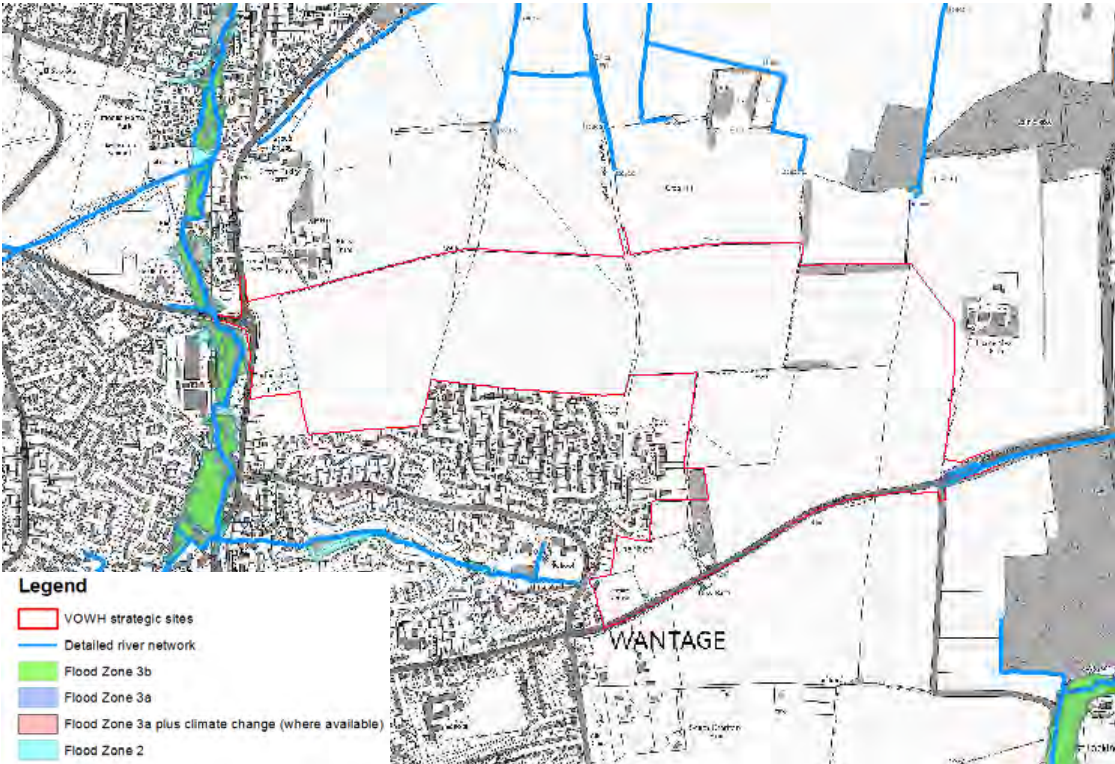
Available survey/detailed modelling

No detailed models available.

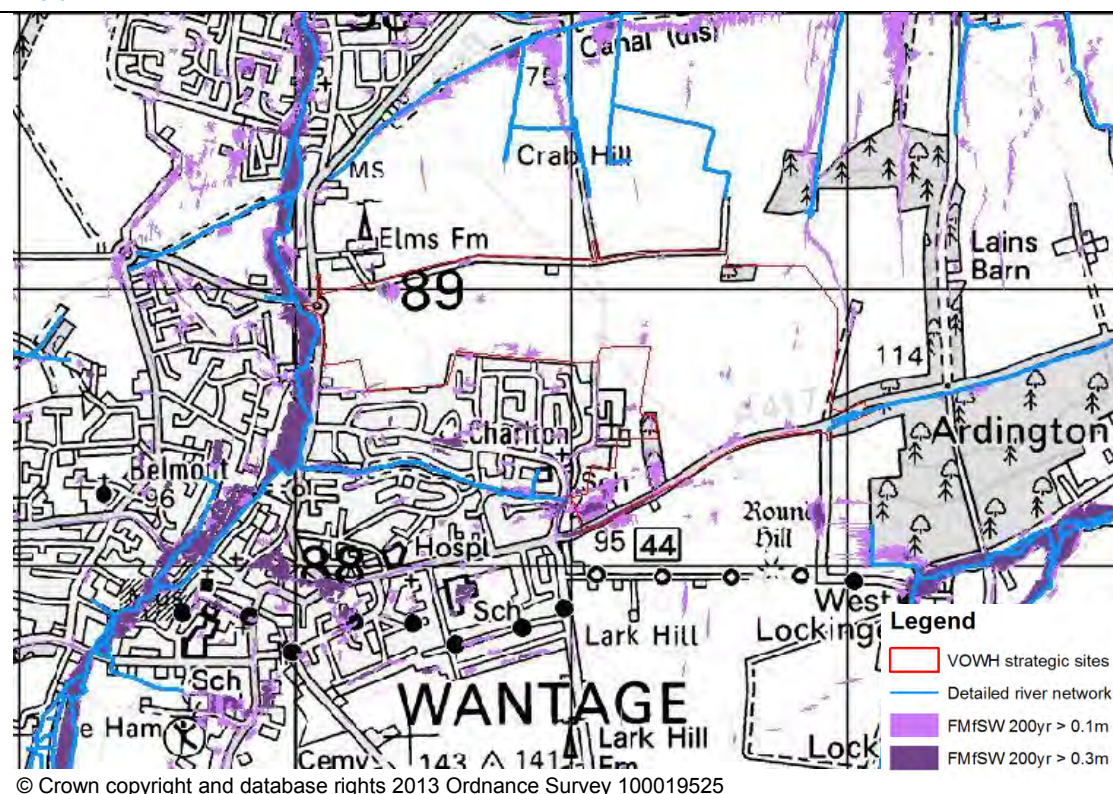
Implications for development

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

B.2.2 Crab Hill, Wantage

Crab Hill			
Area: 96 ha	Brownfield/greenfield: Greenfield	Proposed use: Residential/mixed use - up to 1500 homes with services and facilities	Flood risk vulnerability More vulnerable/less vulnerable
Summary of flood risk to site			
<p>Fluvial</p> <p>There is no known risk from fluvial flooding, although the west of the site is adjacent to the edge of the Flood Zones on Letcombe Brook.</p> <p>There are no flood defences.</p> <p>Flood Zone map</p>  <p>Legend</p> <ul style="list-style-type: none"> VOWH strategic sites Detailed river network Flood Zone 3b Flood Zone 3a Flood Zone 3a plus climate change (where available) Flood Zone 2 <p>© Crown copyright and database rights 2013 Ordnance Survey 100019525</p>			
<p>Surface water</p> <p>The FMfSW shows some discrete areas of potential ponding. A larger area (cricket ground) may be at risk at upstream end of Humber Ditch to south of site. The VOWH Flood Database and 2007 flood grant claimants list show several incidents relating to the Humber Ditch including some immediately downstream of the site.</p> <p>Flood Map for Surface Water (200 year)</p>			

Crab Hill



Groundwater

The AStGWF map suggests the area is at low risk of groundwater flood emergence. No historical record of groundwater flooding.

Sewer

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

Effects of climate change

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

Available survey/detailed modelling


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

- Letcombe Brook (Environment Agency, 2009)

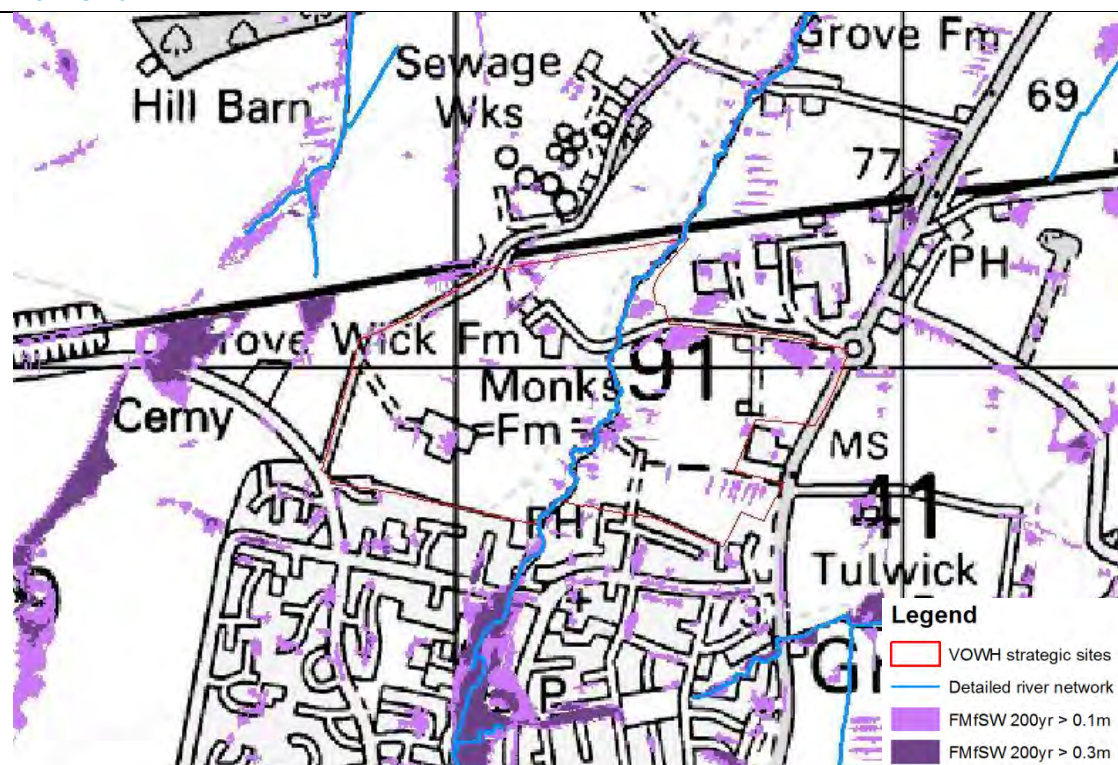
Implications for development

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

B.2.3 Monks Farm, Grove (increased scope assessment)

Monks Farm			
Area: 49 ha	Brownfield/greenfield: Greenfield	Proposed use: Residential/mixed use - up to 750 homes and employment, including the Grove Northern Link Road route	Flood risk vulnerability More vulnerable/less vulnerable
Summary of flood risk to site			
<p>Fluvial</p> <p>Letcombe Brook flows from south to north through the centre of the site. Flood Zone 2 is significantly more extensive than Flood Zone 3, with a width of up to 250m, mostly on the right bank side of the Brook.</p> <p>Depths on the floodplain are likely to reach 0.2m for a 100 year event, 0.3m for a 100 year plus climate change event, and 0.4m for a 1000 year event.</p> <p>There are no flood defences.</p> <p>A number of properties were flooded in July 2007 by Letcombe Brook downstream of the site in East Hanney.</p> <p>Flood Zone map</p> <p>Legend</p> <ul style="list-style-type: none"> VOWH strategic sites Detailed river network Flood Zone 3b Flood Zone 3a Flood Zone 3a plus climate change (where available) Flood Zone 2  <p>© Crown copyright and database rights 2013 Ordnance Survey 100019525</p> <p>Surface water</p> <p>The FMfSW shows some small areas of potential ponding, the largest near the A338 roundabout. The VOWH Flood Database and records of 2007 flood grant claimants show multiple incidents of property flooding in the North Drive area.</p> <p>Flood Map for Surface Water (200 year)</p>			

Monks Farm



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Groundwater

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

Sewer

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

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

Effects of climate change

Increased river flows will cause more frequent and more severe fluvial flooding from Letcombe Brook. The 100 year with climate change modelled outline is significantly larger in area than Flood Zone 3a.

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

Available survey/detailed modelling

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

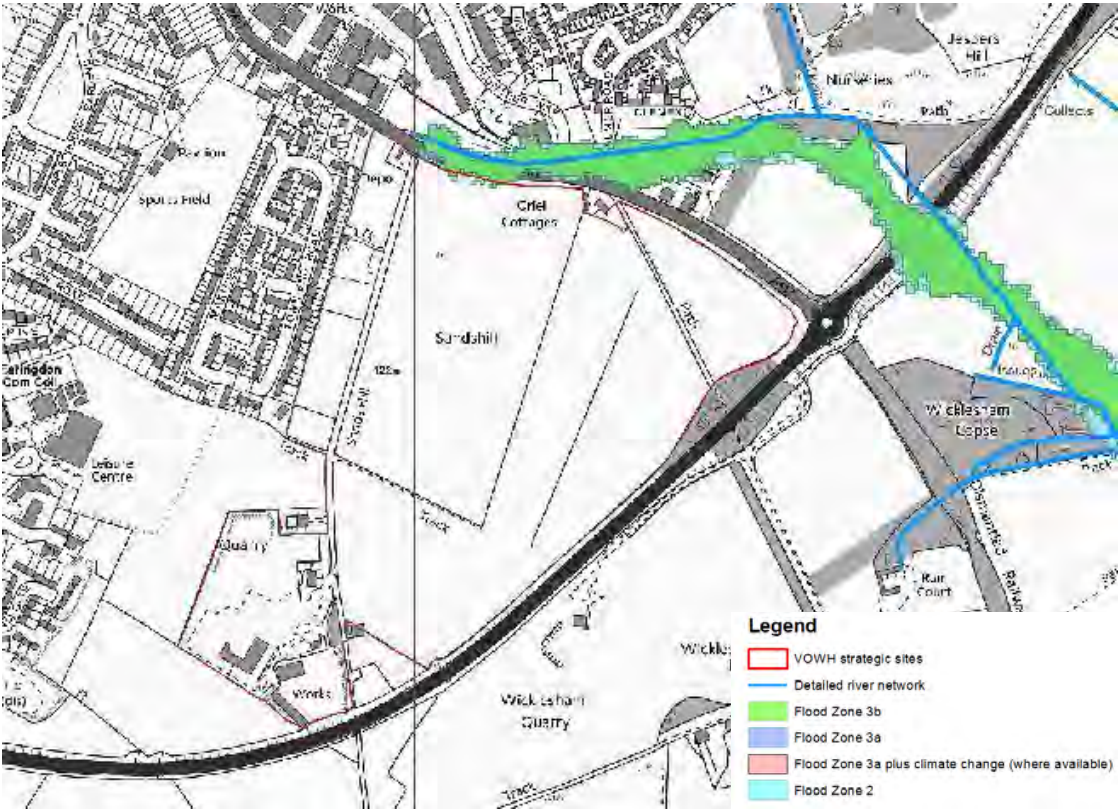
- Letcombe Brook (Environment Agency, 2009)

Implications for development

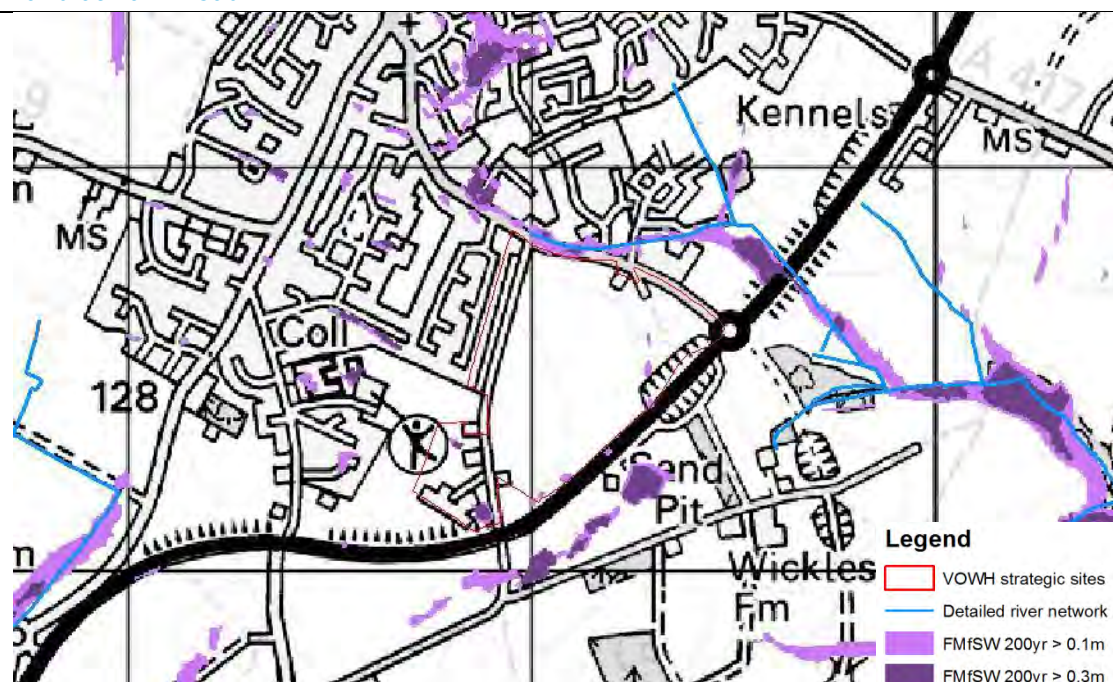
- Requires a full FRA for a site in Flood Zone 3.
- It must be demonstrated that the site will be designed sequentially ensuring all development will be outside of Flood Zone 2 with climate change.
- It must be demonstrated that safe, dry access and egress will be available during a severe flood event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

Monks Farm
<p>capacity in the wastewater system and any upgrades are carried out where necessary.</p> <ul style="list-style-type: none"> • An assessment of the impact of foul water discharge into the Letcombe Brook from Wantage STW should be completed, with mitigation if appropriate.
<p>Implications for the Grove Northern Link Road</p> <ul style="list-style-type: none"> • A bridge will be required across the Letcombe Brook as part of the Grove Northern Link Road project. • The available modelling suggests that flows through the bridge will be around 14.1 m³/s in a 100 year with climate change event, and 22.6 m³/s in a 1000 year event. The natural floodplain is relatively wide here, and there are ecological considerations for this natural chalk stream. The road is therefore likely to require a wide span bridge having least possible impact on the natural floodplain.

B.2.4 Land at Park Road, Faringdon

Land at Park Road			
Area: 28 ha	Brownfield/greenfield Greenfield	Proposed use: Residential/mixed use - around 350 homes	Flood risk vulnerability classification: More vulnerable/less vulnerable
Summary of flood risk to site			
<p>Fluvial</p> <p>Flood Zone 3 and 2 are immediately adjacent to site to the north. A small watercourse on the opposite side of Park Road enters a culvert just downstream.</p> <p>There are no flood defences.</p> <p>Flood Zone map</p>  <p>© Crown copyright and database rights 2013 Ordnance Survey 100019525</p>			
<p>Surface water</p> <p>The FMfSW shows some small areas of potential ponding. No local evidence was found to support this.</p> <p>Flood Map for Surface Water (200 year)</p>			

Land at Park Road



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Groundwater

The AStGWF map suggests the area is at low risk of groundwater flood emergence. No historical record of groundwater flooding.

Sewer

No known problems (site is greenfield).

Effects of climate change

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

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

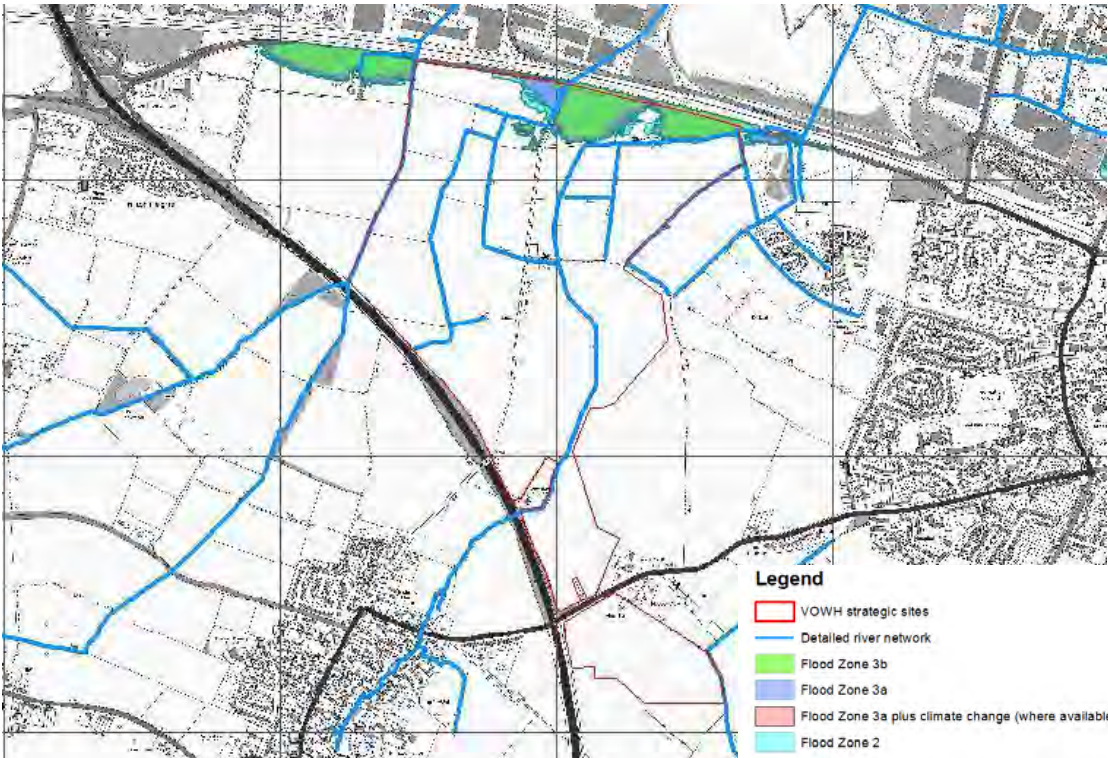
Available survey/detailed modelling

No detailed model available.

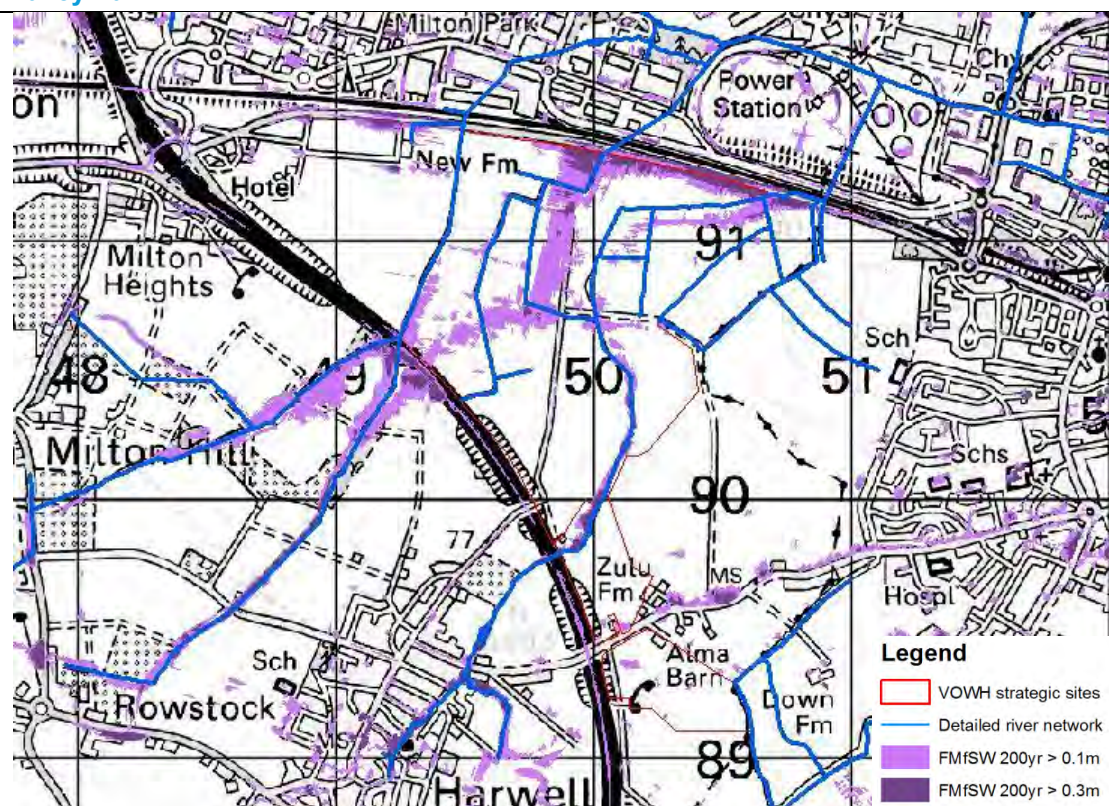
Implications for development

- Requires a full FRA for a site >1ha in Flood Zone 1.
- The FRA should demonstrate that the development will not be at risk from the small watercourse to the north of the site, taking into account the effects of potential blockage of the culvert, though detailed modelling if necessary.
- Drainage strategy should be submitted at an early stage to cover mitigation of any surface water risk and reduce impact downstream through site design and SUDS methods.
- Thames Water should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.

B.2.5 Valley Park, west of Didcot, Harwell Parish

Valley Park			
Area: 126 ha	Brownfield/greenfield Greenfield	Proposed use: Residential	Flood risk vulnerability classification: More vulnerable/less vulnerable
Summary of flood risk to site			
<p>Fluvial</p> <p>Small area to the north of the site is at risk from fluvial flooding from tributaries of Moor Ditch (Flood Zone 3b, 3a and 2). Depths in this area may reach around 0.8m in a 1 in 100 year event, but velocities are likely to be low. There are a number of minor watercourses crossing the site from south to north and entering Moor Ditch, that are not included in the Flood Zones. There are no flood defences. The watercourses enter three long culverts under Milton Road, the railway and the industrial area around Didcot Power Station.</p> <p>Flood Zone map</p>  <p>© Crown copyright and database rights 2013 Ordnance Survey 100019525</p>			
<p>Surface water</p> <p>The FMfSW shows significant potential flow paths across site. No local historical evidence was found but presence of small watercourses supports this assessment.</p> <p>Flood Map for Surface Water (200 year)</p>			

Valley Park



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Groundwater

The AStGWF map suggests the area is at medium to high risk of groundwater flood emergence, with risk increasing towards the northern part of the site. No historical record of groundwater flooding.

Sewer

No known problems (site is greenfield).

Effects of climate change

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

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

Wetter winters may increase groundwater flood risk.

Available survey/detailed modelling

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

- Moor Ditch (HR Wallingford, 2007)

Implications for development

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

Valley Park

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

B.3 Vale of White Horse - main towns

B.3.6 Abingdon

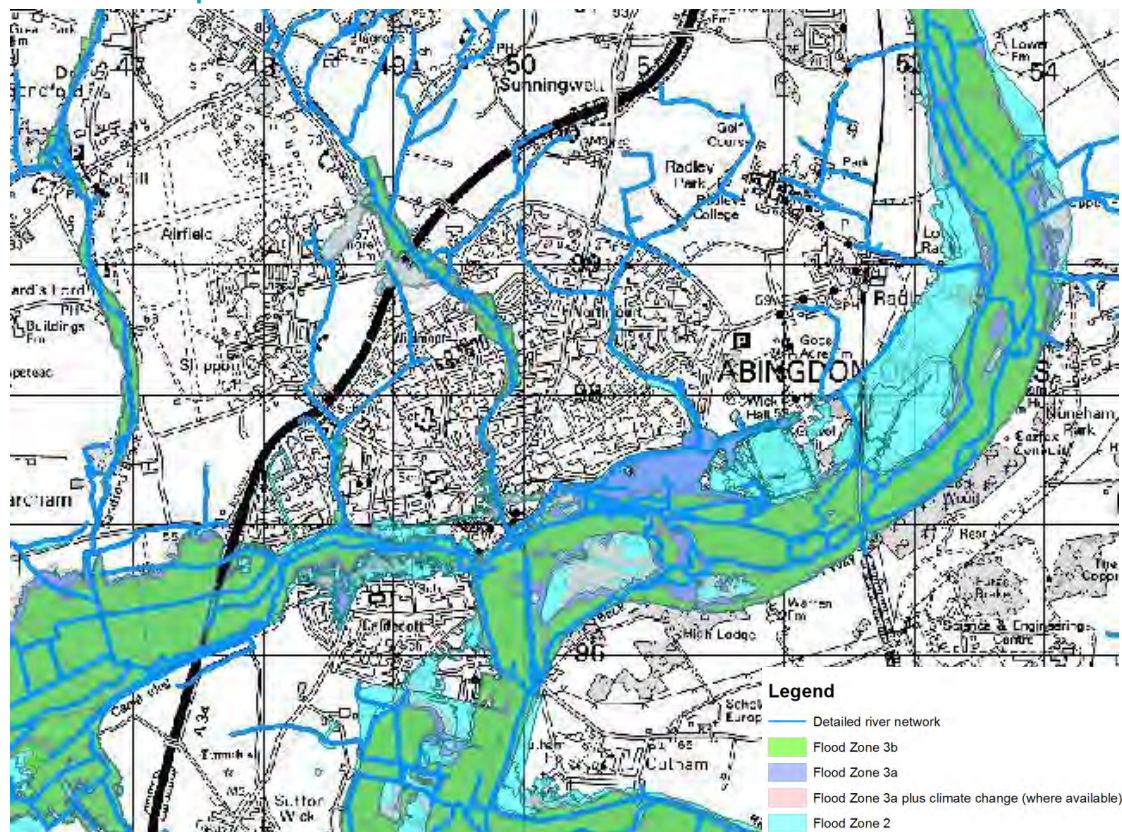
Summary of flood risk to Abingdon

Fluvial

There is extensive flood risk to the town centre and other areas from the River Thames, River Ock, River Stort and their tributaries. The Historic Flood Map (HFM) shows several event outlines, mainly within Flood Zone 3 on the Ock, but also extensive areas in Zone 2 for Thames. There is a well documented history of flooding on the Stort (see Frank Graham report and July 2007 historic outline). There were 412 properties that claimed flood grants in July 2007, mostly on the Stort, Ock and Radley Park Ditch. There are several minor watercourses that are not included in the Flood Zones.

There are no formal flood defences along the River Thames in AIMS, although there are a number of bank protection measures and non-flood defence structures noted, in addition to a private raised bank along Audlett Drive. There are two flood storage areas with raised banks on the River Stort at Tilsley Park. The Council is currently carrying out work on Farm Road Abingdon Flood Alleviation Scheme (due June 2013). There are several long culverts, including the River Stort through the town centre.

Flood Zone map



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Flood hazard mapping

Hazard mapping of the River Stort was undertaken for the 2007 SFRA, and shown in Map 10-13. The flooding mechanism here is overland flow when excess flows are unable to enter the Stort culvert, and surcharging from Stort manholes. The maps show that for all return periods modelled, the vast majority of the inundated area is classed as 'Dangerous for Some' (e.g. children). The overland flow is likely to be fast flowing but relatively shallow. More detail is given in Chapter 5.

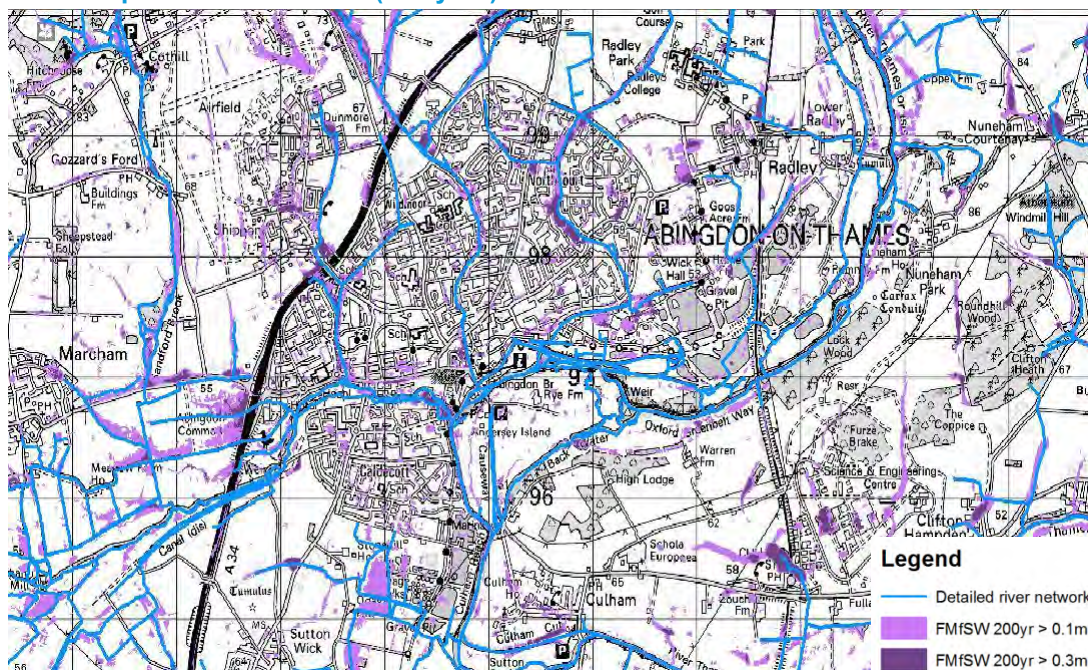
Surface water

The FMfSW shows significant flow routes along the Radley Park Ditch (which is not included in the fluvial Flood Zones) and Wildmoor Ditch, and other isolated potential areas of ponding. Many of the properties affected in 2007 were flooded by surface water outside of the Flood

Summary of flood risk to Abingdon

Zones.

Flood Map for Surface Water (200 year)



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Groundwater

The AStGWF map suggests the north west of Abingdon is at relatively low risk of groundwater flood emergence, with risk increasing to the highest risk category towards the River Thames, associated with the Thames fluvial gravels. One incident was recorded by the Environment Agency in 2008, within the Flood Zone close to the bridge.

Sewer

There are 17 properties on the Thames Water sewer flooding register within the four postcodes covering Abingdon (OX14 1, 2, 3 and 5), six of which have been flooded internally. No other evidence found of sewer flooding.

Reservoir

Abingdon is within the flood risk envelope in the event of a failure at Farmoor Reservoir. For more information see the Environment Agency website under [Risk of Flooding from Reservoirs](#)¹¹.

Effects of climate change

Climate change is likely to increase the fluvial flood extent and severity of the River Ock in the Caldecott area, and the River Stort and Thames in the town centre.

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

Wetter winters may increase groundwater flood risk.

Available survey/detailed modelling

The following detailed models have been used in the Flood Map:

- River Thames Sandford to Whitchurch (Environment Agency, 2000)
- River Ock A34 to Thames Confluence (Environment Agency, 2009)
- River Ock Frilford to A34 (Environment Agency, 2007)
- River Stort (JBA, 2009)

The following models are available for use in FRAs but have not been used for mapping due

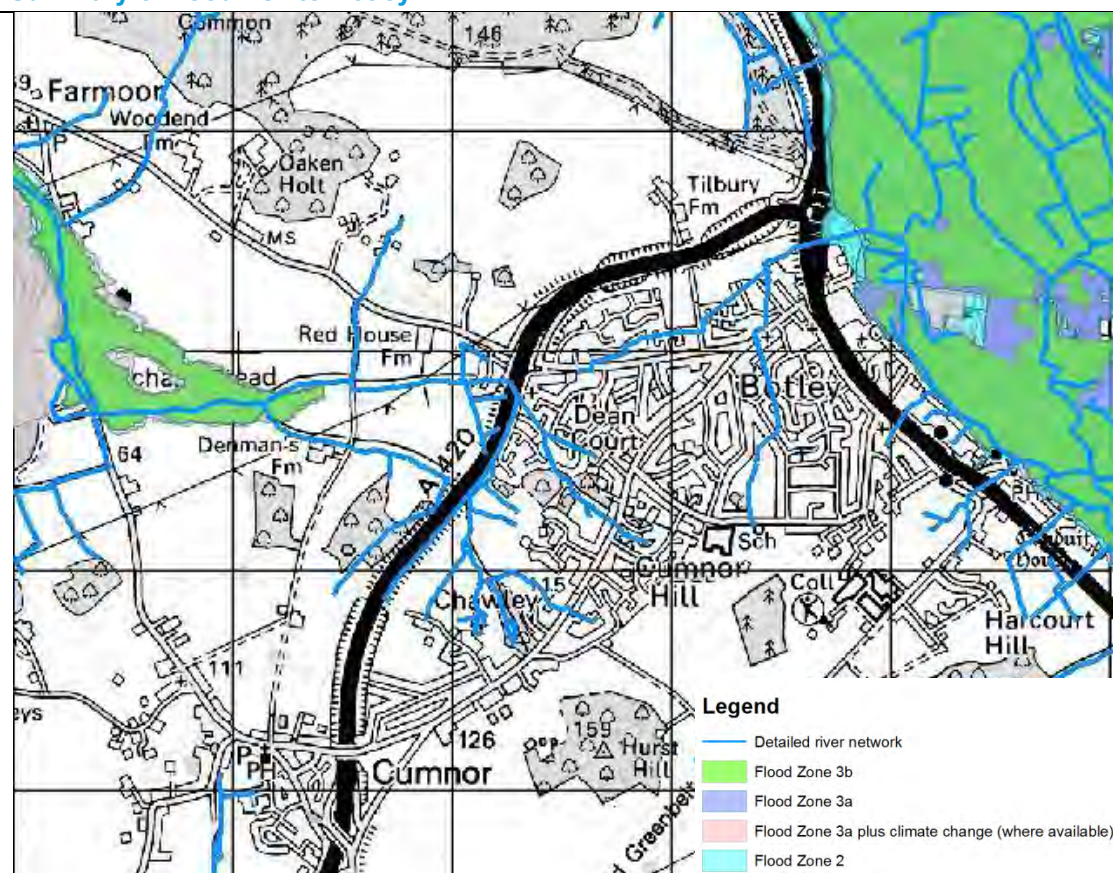
¹¹ Environment Agency - Risk of flooding from Reservoirs map available at http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=m&ap&textonly=off&lang=_e&topic=reservoir

Summary of flood risk to Abingdon
to lack of LIDAR data: <ul style="list-style-type: none"> • Wildmoor Brook/Larkhill Stream (JBA, 2007)
Implications for development <ul style="list-style-type: none"> • Development allocations should be sequentially located away from Flood Zone 2 and 3. • Development should also avoid proximity to the smaller watercourses such as Radley Park Ditch, Wildmoor Ditch and Larkhill Stream, where there is low confidence in the Flood Zones, and surface water flow paths are shown in the FMfSW. If development is proposed in proximity to them, a FRA should be undertaken to ascertain the flood risk in the absence of a Flood Zone. • Redevelopment which is continuing in the Town Centre should be planned sequentially taking into account flood hazard from the River Stort and River Ock. • Thames Water should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.
Implications for the Abingdon Southern Bypass road <p>The Local Plan has earmarked land for safeguarding for future transport schemes, including land to the south and west of Abingdon for a future bypass route. This potential route is not likely to be taken forward within the life of the current Local Plan (to 2029).</p> <p>It should be noted that the safeguarded route crosses areas of significant flood risk: approximately 1.4km of the River Thames floodplain to the south and 0.6km of the River Ock floodplain to the west.</p> <p>This has implications for the design of the route in terms of flood risk (to the route itself and elsewhere) and environmental impact, both during the construction stage and the built life of the project. The Environment Agency should be consulted at an early stage if these plans are to be taken further.</p>

B.3.7 Botley

Summary of flood risk to Botley
Fluvial <p>Botley borders the edge of the Thames floodplain to the east, and there is an area at risk from Filchampstead Brook to the east. There are several minor watercourses within Botley that are not included in the Flood Map. Past flooding from the Thames is shown on the HFM. Eleven properties claimed flood grants in 2007, most within the River Thames Flood Zones.</p> <p>There are no formal flood defences recorded.</p>
Flood Zone Map

Summary of flood risk to Botley

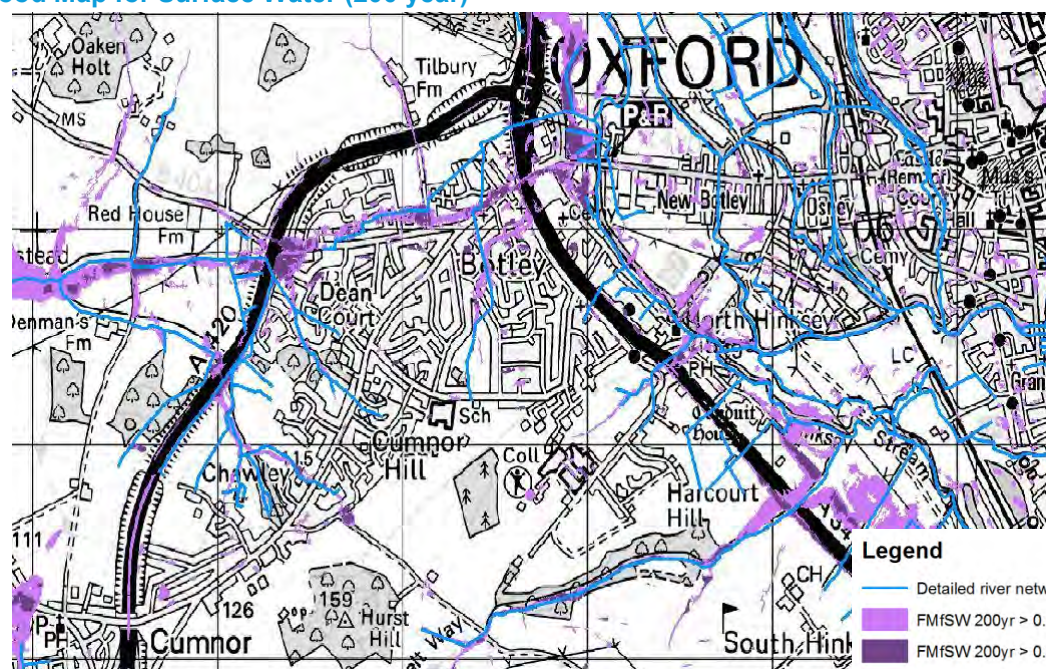


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Surface water

The FMfSW shows significant flow routes along the small watercourses through Botley. There are 45 records on the VOWH Flood Database, mainly citing reasons of flooding from ditches and gully blockages.

Flood Map for Surface Water (200 year)



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<p>Summary of flood risk to Botley</p>
<p>Groundwater</p> <p>The AStGWF map suggests that the majority of Botley is at relatively low risk from groundwater emergence, with risk increasing to medium towards the Thames floodplain. No incidents mapped in Defra report for 2000/1 and 2002/3 events. High occurrence of springs which are intercepted into surface water sewers and with some emergence at ground level (Peter Dela, VOWH, 2007). Two incidents of groundwater flooding on Environment Agency records in 2001 and 2002, both on the southern edge of Botley.</p>
<p>Sewer</p> <p>Botley has a history of sewer flooding problems, in combination with fluvial and surface water flooding. There are several properties recorded as flooding due to overloaded or blocked sewers in the VOWH Flood Database, mainly in the Thames floodplain and along Botley Road. Thames Water put in a scheme which was completed in December 2012¹², which was crucial to allowing development to go ahead in Botley. However the area experienced sewer/surface water flooding at end of November 2012, for which Thames Water blamed 'operational reasons'. There are 26 properties on the Thames Water sewer flooding register for the OX2 9 postcode, 16 of which have been flooded internally.</p>
<p>Reservoir</p> <p>Botley is within the flood risk envelope in the event of a failure at Farmoor Reservoir, which covers roughly the same area as the Flood Zones. For more information see the Environment Agency website under Risk of Flooding from Reservoirs¹³.</p>
<p>Effects of climate change</p> <p>Climate change is unlikely to increase the Thames flood extents very much (the floodplain is well contained and there is little difference between the Flood Zones), but frequency and severity of flooding will increase. Increased rainfall intensity in the future may exacerbate flooding from sewers, surface water and small watercourses. Wetter winters will exacerbate groundwater flooding problems.</p>
<p>Available survey/detailed modelling</p> <p>The following detailed models have been used in the Flood Map:</p> <ul style="list-style-type: none"> • River Thames Wolvercote to Kennington (Environment Agency, 2006) <p>The Filchampstead Brook Flood Zone is based on national broad-scale mapping and should be treated with lower confidence.</p>
<p>Implications for development</p> <ul style="list-style-type: none"> • Development allocations should be sequentially located away from Flood Zone 2 and 3. • Development should be sequentially located away from smaller watercourses such as Filchampstead Brook and the drains. If development is proposed in proximity to them, a FRA should be undertaken to ascertain the flood risk where there is little confidence in the Flood Zone, or no Flood Zone present. • Development must not impact on existing sewer and surface water flood risk. • Thames Water should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.

¹² http://www.ukwaterprojects.com/case_studies/2012/Thames_Botley_2012.pdf

¹³ Environment Agency - Risk of flooding from Reservoirs map available at http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=m&ap&textonly=off&lang=_e&topic=reservoir