Conceptual Model of Flooding in Marlow

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Jacobs UK Ltd.

The Lincoln, Lincoln Square
9 Brazennose Street
Manchester M2 5AD
United Kingdom

T +44 (0)161 235 6000
F +44 (0)161 235 6001
www.jacobs.com

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1. Introduction

Marlow is one of three focus communities within Project Groundwater where Permeable Superficial Deposit (PSD) groundwater flooding is known to occur. To provide context for the groundwater monitoring, modelling/mapping and early warning workstreams within the Marlow community area, a conceptual model of flooding mechanisms is provided here. This conceptualisation addresses all relevant forms of flooding, including fluvial (river) flooding. It also provides an overview of flood receptors and known impacts. Knowledge gaps are identified and an assessment made as to how these might be addressed.

Marlow is located on the northern bank of the River Thames, northwest and upstream of Maidenhead (Figure 1-1. Marlow PSD Study Area). The town has an area of approximately 4.26km^2 and the population at the time of the 2021 Census was 14,767 with approximately 6,300 properties, the majority of which are domestic (City Population, 2025). The majority of the town and surrounding area to the southwest and northeast sits on the superficial deposits of the current River Thames floodplain. The deposits in the floodplain comprise alluvium in the immediate vicinity of the River Thames and then the Shepperton Gravel Member and Taplow Gravel Member (comprised of sand and gravel), moving further north from the river (BGS,2025a).

The flood conceptualisation is based on data and local experience of flooding in the Marlow area. Use is also made of river level data within and upstream of the area for the period 2002-2025 and limited groundwater level data within the wider area for 1996 to 2025 taken from the Environment Agency's hydrology data explorer (Environment Agency, 2025a). Since 1768 there have been multiple significant flood events that have included groundwater flooding within the urban area.

This document initially provides an overview of the data sources used in developing the conceptual model, and then contextual information on the area, primarily the hydrogeology and hydrology, followed by the conceptualisation of flooding, and lastly an assessment of the knowledge gaps.

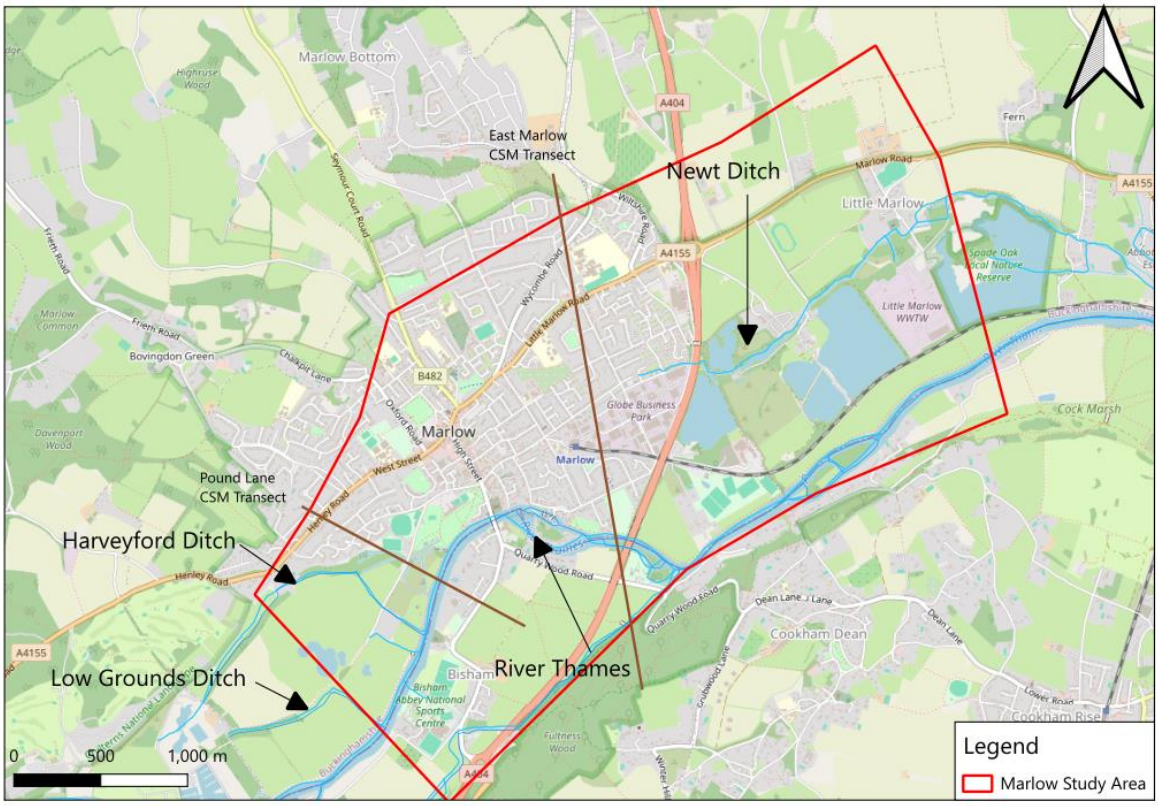


Figure 1-1. Marlow PSD Study Area

2. Information and data sources

2.1 National Hydrometeorological Monitoring Network and Spatial Mapping

Data from the Environment Agency (EA) hydrometeorological monitoring network contributed to the development of the conceptual flood model for Marlow. These include:

- Groundwater level data (with a combination of both continuous data and manual dips);
- River water level, and;
- Rainfall data.

These stations are both local to Marlow Study Area in the Thames and Chilterns South Management Catchment and in the Kennet Operational and Loddon Operational Catchments upstream (Figure 2-1). The data were used to understand the response of the river levels in the Marlow area to rainfall events in the catchments of the Thames and the feeder operational catchments of the Rivers Loddon and the Kennet.

The monitoring stations used for this study are presented in Table 2-1.

Note, there is a rainfall station, Marsh Lane, which is in close proximity to the Study Area (approx. 8km south), however this is in a downstream catchment of the Study Area and in a comparatively newer station (2018) and cannot be used to compare against flooding events in the area (which all predate this station).

Table 2-1. Hydrometeorological Monitoring Network

Monitoring Station	Station Type	Station ID	Start of recordings
Fawley Green	Groundwater levels (manual)	SU78_48	18/4/1955
Poynatts Manor	Groundwater levels (manual)	SU79_25	18/4/1955
Ray Farm	Groundwater levels (manual) Groundwater Levels (continuous)	SU89_82	28/2/1984 25/10/2011
Stonor Estate	Groundwater levels (manual) Groundwater Levels (continuous)	SU78_45C	08/04/2015 29/01/2015
Hamble Brook	Groundwater levels (manual) Groundwater Levels (continuous)	SU78_122	26/04/1998 07/12/1998
Hambleden	Groundwater levels (manual) Groundwater Levels (continuous)	SU78_7	29/04/1966 15/03/1996
Marlow Lock	Daily and 15-minute river level	2499TH	12/02/2002
Hurley Lock	Daily and 15-minute river level	2497TH	11/02/2007
Marsh Lock	Daily and 15-minute river level	2495TH	29/11/1995
Twyford	Daily and 15-minute river level	2490TH	22/11/1994

Monitoring Station	Station Type	Station ID	Start of recordings
Blakes Lock	Daily and 15-minute river level	2298TH	01/01/1991
Benson	Daily and 15-minute rainfall	264254TP	31/10/1990
Stokenchurch	Daily and 15-minute rainfall	274178TP	01/01/2001
Cleeve	Daily and 15-minute rainfall	264845TP	30/09/1986
Kingsclere	Daily and 15-minute rainfall	269627TP	31/05/1989
Basingstoke	Daily and 15-minute rainfall	270669TP	29/06/1988
Camberley	Daily and 15-minute rainfall	271491TP	13/09/1979
Reading University	Daily and 15-minute rainfall	270397	19/03/2013
Chieveley	Daily and 15-minute rainfall	268851TP	14/09/1979

In addition to hydrometeorological data, spatial mapping was also used within the conceptual modelling to identify areas where topography may play a part in where various types of flooding occur (Environment Agency, 2025b). Geological bedrock and superficial deposits maps of the area are available at 1:50,000 scale from the British Geological Survey (BGS).

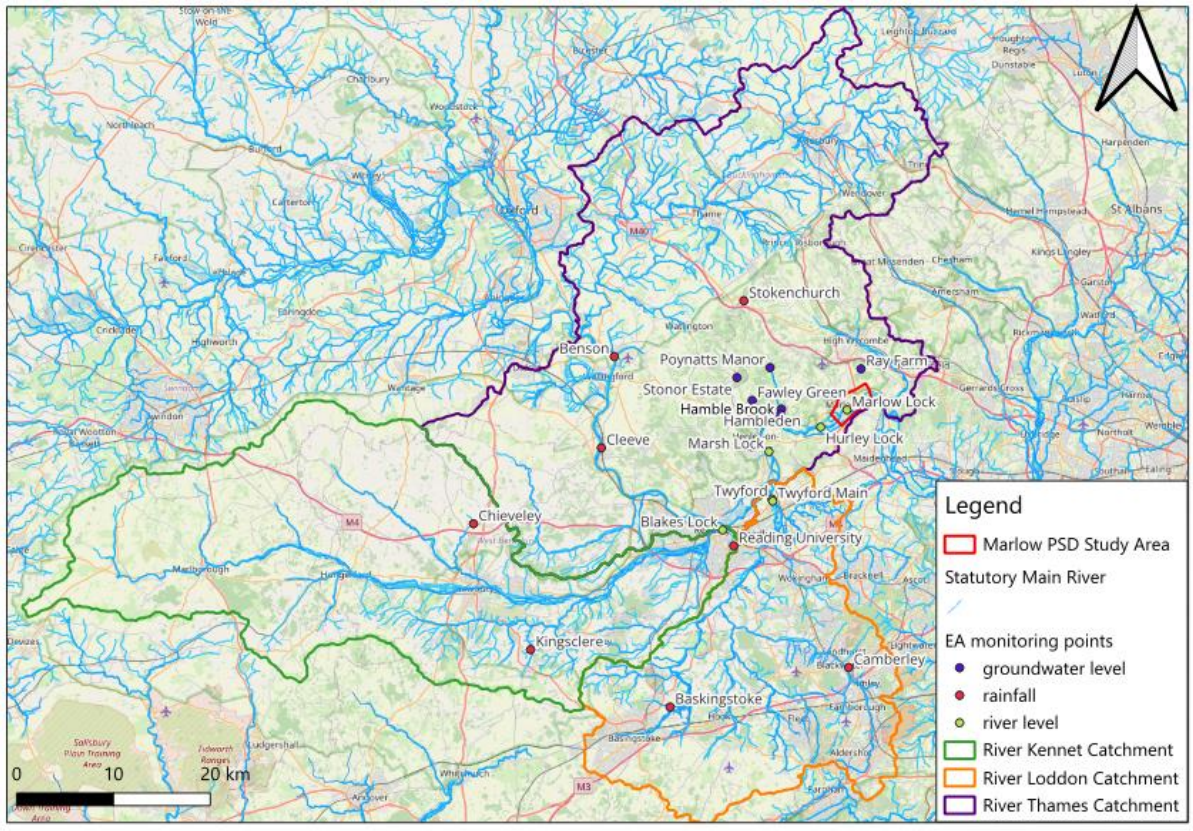


Figure 2-1. WFD surface water body catchments and EA monitoring locations

2.2 Local Flood-Related Studies

Work has been undertaken to address flooding in the Marlow area, both for fluvial and groundwater flooding. The majority of the work focuses on Marlow as a whole, especially the southern and eastern parts where flooding is an issue. The following schemes to address flooding in Marlow have resulted in the collection of data relevant to both surface water and groundwater flows:

Marlow Flood Alleviation Scheme (FAS): this study was developed by the Environment Agency. The scheme was developed to reduce the risk of direct river (fluvial) flooding and indirect flooding from groundwater and local drainage systems (UK Government, 2017). The scheme involved the development of raised walls and earth embankments mainly around Pound Lane and Firview Close/ Gossmere Lane, along with the installation of groundwater pumps in the superficial deposits at both locations (see details below). Additionally, compensatory flood storage at Lower Pound Lane was installed.

As part of the FAS, Project Dewatering Ltd. were appointed by Galliford Try, Black and Veatch VC in 2017 to install and commission a permanent dewatering system in Marlow (Project Dewatering Ltd., 2018). The objective of the work was to control groundwater levels in the upper aquifer and assist with flood prevention in Marlow. As part of the works 16 large diameter pumping wells were drilled and developed to depths ranging between 6 to 8 metres below ground level (mbgl). The boreholes were fitted with submersible pumps with each having a capacity to pump up to 30 litres per second (l/s). The operation of these pumps are fully automated and operated remotely through the use of Supervisory Control and Data Acquisition (SCADA) telemetry. The pumps are level sensor controlled and turned on when the borehole/sump trigger level is reached.

The Newt Ditch Marlow Flood Alleviation Scheme : following the Marlow Surface Water Management Plan (SWMP) the lead local flood authority (LLFA) developed a scheme to reduce flood risk to around 100 residential and 60 non-residential properties around Newt Ditch in East Marlow (Buckinghamshire Council, 2025a). Roads in East Marlow prone to flooding include Dedmere Road, The Croft, Quarrydale Drive and Fieldhouse Lane (Buckinghamshire Council, 2025b). The primary cause of flooding in this area is the lack of capacity in, and conveyance through, the culverts that drain into and along Newt Ditch. Tree roots and sediment build up are also affecting the capacity and increasing the flood risk. The scheme also includes replacing and cleaning pipework along the ditch with sections of the ditch being reverted back to correctly graded open channel to increase storage capacity and conveyance. Where the ditch flows to the east of the A404 plans include re-grading the Newt Ditch and modifying existing siphons to improve flow.

These schemes seek to improve the local situation. The Marlow FAS has already been delivered and has managed the fluvial flooding across Marlow in the Pound Land and Gossmore locations. The pumps provided in these locations will help manage the groundwater levels locally. The interaction between fluvial levels and groundwater flooding still remain as the groundwater levels are not impacted more widely (only locally) by the pumping. The mechanisms identified in the conceptual model do represent the natural condition. It should be recognised that the schemes do manage the fluvial flooding from the river and will help manage the surface water flooding in and around the Newt Ditch and this is reflected in the commentary in the conceptual modelling chapter 4.

2.3 Local flood impact data.

2.3.1 Section 19 Flood Investigation Report

A Section 19 Flood Investigation Report was produced for Marlow dated 2015 (Buckinghamshire County Council, 2015). This flood investigation report relates to flooding between the 9th January to 20th February 2014. During this flood event flooding occurred in the Pound Lane Area and East Marlow, with three areas within these specifically mentioning groundwater as a contributor to flooding.

The flood event occurred after a prolonged period of rainfall which led to groundwater levels in the aquifer underneath Marlow to rise to unusually high levels. Levels rose to a point where the surrounding land became saturated and subsequent rainfall along with groundwater emergence caused flooding. At Pound Lane soakaways were unable to operate due to high groundwater levels which increased pressure on the pumps at the River Thames, which led to surface water pumps being overwhelmed. Additionally, the sewer system became overwhelmed from groundwater ingress which exacerbated the flooding.

Other sources of flooding during this period came from the River Thames overtopping twice, flooding low lying parts of Marlow and a culvert on Newt Ditch (where surface water drainage is discharged to) becoming overwhelmed with flow and sediment blocking the culvert causing surface water to back up into East Marlow.

The Section 19 Report notes that historical flooding in Marlow dates back to 1768, with two previous recorded occurrences of groundwater flooding in winter 2000/2001 and 2010/2011 (Buckinghamshire County Council, 2015). The winter 2000/2001 flooding affected 3 locations in Marlow and 30 properties were flooded. The 2010/2011 flood event affected multiple areas including Willow Mead estate, Dedmere Road, The Acre, Little Marlow Road (near Maple Rise), Kenton Close and Pound Lane (with flooding from both groundwater and surface water). There may have been other groundwater flooding events, but these may not have been recorded as such. Flooding from groundwater is not always recognised as may be identified as flooding from the river or surface water.

2.3.2 Surface Water Management Plan 2013

Anecdotal evidence in the Surface Water Management Plan from 2013 notes that flooding of roads and properties adjacent to the River Thames can occur via floodplain gravels, even when the River Thames is still in-bank (Buckinghamshire County Council, 2013). Specific areas noted include areas of Pound Lane and Firview Close/Gossmore Lane to the east, with these areas historically having issues with flooding of properties and gardens from high water tables. Responses to questionnaires distributed to the community as part of this report identified various flood events where groundwater was thought to be a likely contributor. These events reported in the questionnaire and SWMP are the following :

- Groundwater flooding in winter 2000/2001 affecting 30 properties;
- Flooding in July 2007 likely to be a combination of groundwater, surface water and fluvial flooding;
- Flooding in 2009 partially caused by a sustained period of high groundwater levels, and;
- December 2012 likely to be a combination of groundwater, surface water and fluvial flooding.

2.3.3 Local Flood Risk Management Strategy

The Local Flood Risk Management Strategy (FRMS) for Buckinghamshire Council (2023) also refers to a groundwater flooding event in Marlow in February 2009. It also noted that in the winter 2000/2001 groundwater levels remained high for many months in Marlow causing extensive flooding of roads, properties and public areas.

2.3.4 Community Engagement

Two flood fayres have been held in Marlow since 2014 to highlight the issues with flooding, allow residents to ask questions and receive information from the various Risk Management Authorities and to raise the awareness of all types of flooding within the area including groundwater flooding.

In 2023 the Project Groundwater team attended two events in Marlow (Marlow Carnival and Marlow Flood Fayre) to talk to local residents about groundwater flooding. Local residents identified areas prone to flooding, particularly around Pound Lane and Gossmore Lane - as shown in Figure 2-2. The majority of the flood incidents identified by locals do not distinguish between different flooding types but it allowed hotspots for flooding to be identified, and the local knowledge provides insights into flood impacts.

Other insights into flood impacts within the Marlow area have come through discussions between local residents and a third party (Environment Agency).

Flooding of different types is not confined to the town of Marlow and other areas such as Bisham, Medmenham, Little Marlow and Bourne End are also impacted by different forms of flooding: fluvial; surface water; and groundwater. The Marlow FAS was focussed on where there was the greatest number of properties at risk but did not cause increased flooding in these other locations. The Newt Ditch project is focussing on relief of surface water and fluvial flooding for the east part of Marlow whilst ensuring that flooding for communities downstream is not increased.

The impact of groundwater flooding for the communities of Bisham, Bourne End, Medmenham and Little Marlow are driven by the same mechanisms as described above and in the conceptual model section – Chapter 4. Rising fluvial flood water control the groundwater levels in the gravels and groundwater levels in the chalk rise due to rainfall and infiltration through the ground. The groundwater flows through the chalk and emerges in the lower areas around these communities. There may be a delay in this mechanism of groundwater flooding as the rise of levels in the chalk is slower than that groundwater flooding in the gravels which is more directly linked to rising river level. Both mechanisms can occur in Marlow and the surrounding communities.

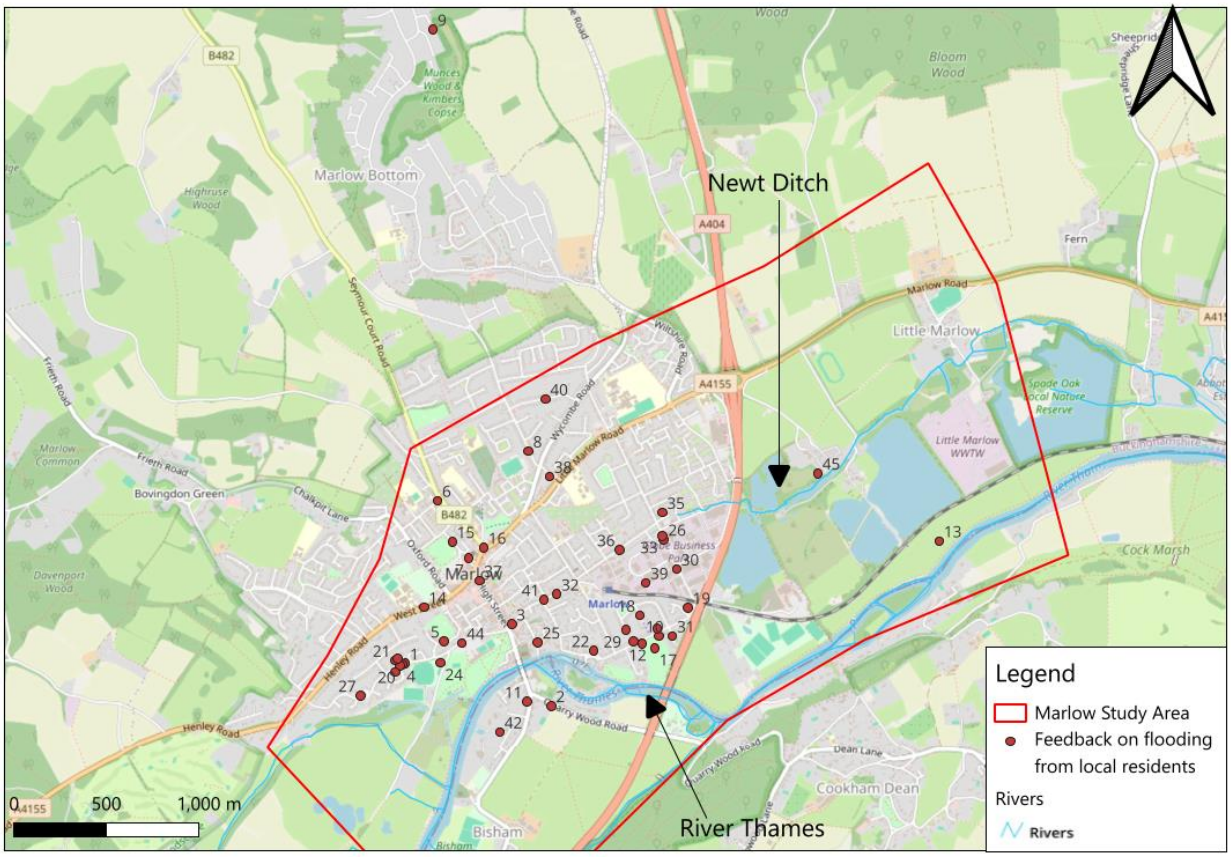


Figure 2-2. Areas of flooding identified by local residents

3. Contextual information

3.1 Physical features, Including Surface Water Network

Marlow lies to the northwest of Slough and northeast of Reading along the River Thames. The majority of Marlow is located within the floodplain of the River Thames. The Marlow PSD Study Area (referred to as Study Area) is mainly urban and lies north of the River Thames, with some more rural areas to the south of the river included in the Study Area. On the northern bank around Marlow town there are areas directly adjacent to the River Thames where there is open land (i.e. no buildings). However, it is not rural in nature and contains recreational grounds, playing fields and gardens/parks. Within the Study Area more rural land is present to the east of the A404.

3.1.1 Topography

Figure 3-1 is a map of the ground elevation of the Marlow PSD Study Area. The area is shown on topographical mapping to be very gently sloped towards the edge of the floodplain of the River Thames. Within the Study Area elevations range from approximately 49 metres above Ordnance datum (m AOD) to 26m AOD in the east along the River Thames. The Study Area is located within the floodplain of the River Thames, as is the majority of Marlow town. The Thames floodplain favours the north bank of the Thames as this is at similar altitudes of the river; the southern bank by contrast is a topographical high ten of metres above the river level.

To the north of Marlow there are multiple dry chalk valleys (a valley formed by water erosion but without a permanent river as water infiltrates into permeable bedrock) which feed into the Thames catchment.

Within East Marlow and east of the A404 there are multiple historical landfills which could create very small topographical highs locally and some historic gravel pits which could create some small topographical lows locally.

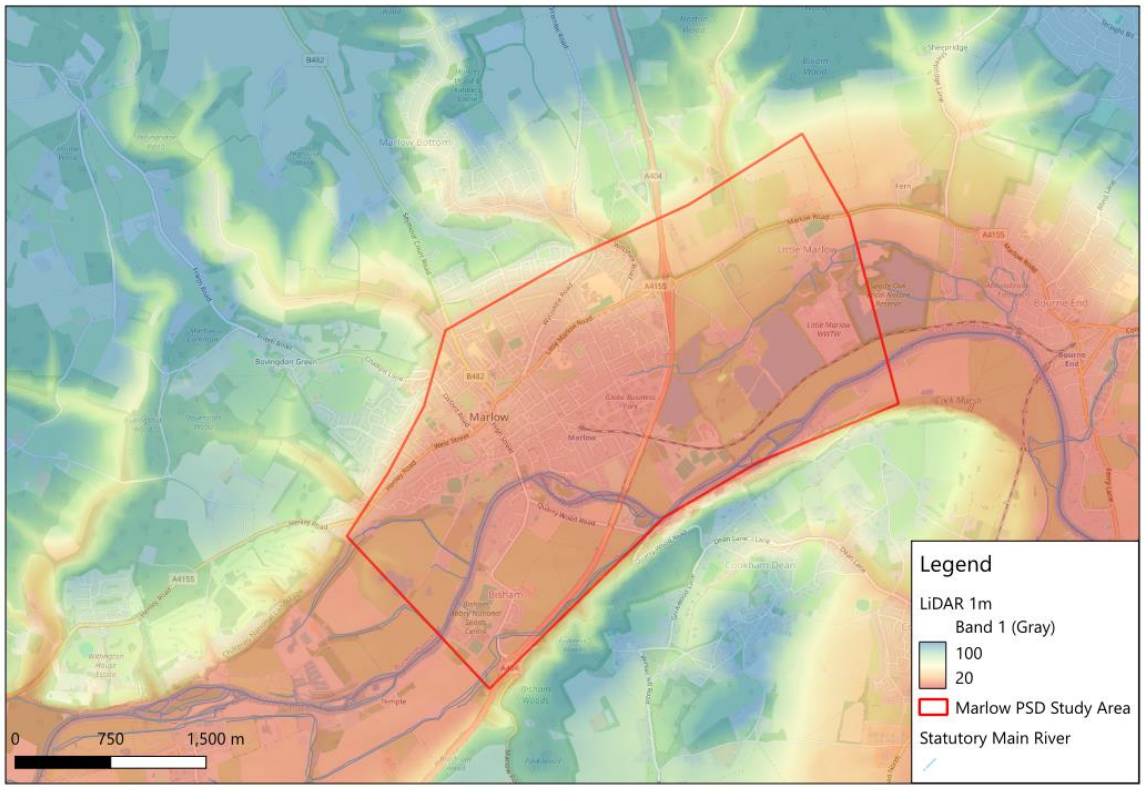


Figure 3-1. Topography of Study Area and wider catchment

3.1.2 Surface Water Features

The hydrological setting of Marlow is displayed in Figure 1-1 and Figure 3-2. Within the Marlow area the River Thames follows its natural course south of the town flowing west to east, with multiple fluvial islands present within the channel. Elsewhere in the Study Area there is only one Ordinary Watercourse (Newt Ditch) which is located in East Marlow. This watercourse is mainly culverted with an open section north of Savill Way to the A404, where it flows under the road and discharges into a ditch system via an outfall. This ditch system flows east through a number of sluices and discharges into the River Thames downstream of Marlow at Bourne End. Figure 3-2 shows the fluvial flood zones within the Marlow area.

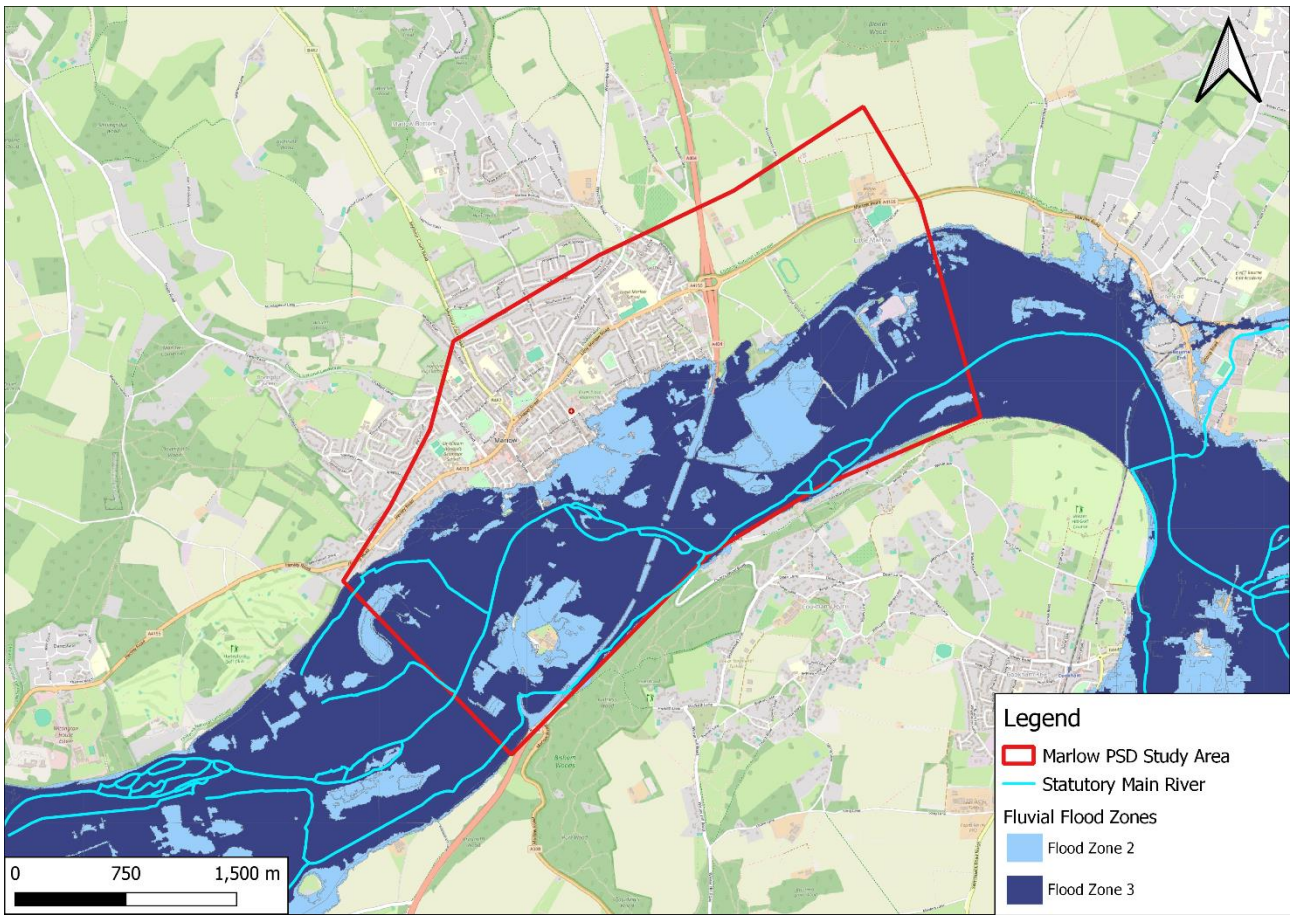


Figure 3-2. Fluvial Flood Zone in Marlow

To the southwest of Marlow at Pound Lane there are multiple small drains between the playing fields. These ditches are shown on historical mapping dated 1888-1915 therefore are relatively old features (National Library of Scotland, 2025). The two larger ones shown on Figure 1-1, Harveyford Ditch and Low Grounds Ditch, also appear to be following the same course as historical maps (National Library of Scotland, 2025) suggesting that they are natural features which have become more controlled over time with the addition of pumps to maintain water levels (see section 3.1.3).

To the east of Marlow and east of the A404 there are large lake features which are old gravel pits which have subsequently been allowed to fill with water after working ceased. It is likely that the water that fills this feature is a combination of both rainfall/runoff and groundwater.

3.1.3 Surface/ Groundwater Water Controls

Water within the drains at Pound Lane (in-between the playing fields) is pumped into the River Thames. These pumps are owned and operated by the Environment Agency.

There are some underground tanks and pumps in the Pound Lane residential area which were installed to pump surface water away from low-lying houses and highways along Pound Lane, Marlon Court and Garnet Court. The water which collects in these tanks is pumped south to the River Thames. The pumps turn on automatically when trigger levels are reached and are maintained/operated by the local Highways Authority. The tanks can become inundated with groundwater resulting in the need for a greater output/flow rate from the pumps. This can lead to pumps struggling to pump larger volumes of groundwater during times of high groundwater levels and also at times of high river levels when the pumps need to pump against the increased head of water at the outfall into the River Thames.

Data has been provided by the Environment Agency for four pumps in the Marlow area. The exact location of these pumps has not been provided however the trigger levels for three of the four pumps are noted in the data. These are as follows:

- Marlow Cricket Club (pump starts when levels reach 27.4m AOD and stop when levels are 25.8m AOD)
- Marlow Pound Lane (pump starts when levels reach 27.35m AOD and stop when levels are 25.1m AOD)
- Marlow Gossmore 2PS (unknown what levels pumps starts and stops at)
- Marlow Gossmore 1 PS (unknown what levels pumps start at but pump stops when levels reach 24.7m AOD)

The pumping is designed to keep groundwater levels locally at a level to manage any groundwater flooding in the vicinity of the pumps. In an extreme event the groundwater flows could exceed the pumping capacity as the pumping rates have not been designed to mitigate against a specific design event.

Along the course of the River Thames there are multiple locks which control water levels and flows in the river. One of these, Marlow Lock, is located within the Study Area.

3.1.4 Statutory Designated Sites

There are two Sites of Special Scientific Interest (SSSI) located in close proximity to Marlow which lie south of the River Thames and south of the Study Area. These are Bisham Woods SSSI and Cock Marsh SSSI. Cock Marsh SSSI has the potential to be a Groundwater Dependent Terrestrial Habitat (GWDTE) due to fluctuating water levels noted as being important to the site (Natural England, 1983).

Additionally, one of the gravel pits situated east of the A404 is now a Local Nature Reserve (LNR); Spake Oak.

3.2 Geology and Hydrogeology

Both the superficial geology and bedrock geology of the Study Area and the surrounding area have been interpreted using BGS 1:50,000 scale geological mapping (BGS, 2025a).

In the absence of any site-specific ground investigation (GI) data a selection of BGS boreholes have been selected from the area to give a representative summary of the geology and depths of various lithologies (BGS, 2025a).

Borehole records used for the conceptualisation of the study area are presented in Table 3-3.

Table 3-1. BGS Borehole Records Selected in the Study Area

Borehole BGS Reference	Depth	Easting	Northing	Borehole Log
SU88NE6	91.44	485760	187430	https://api.bgs.ac.uk/sobi-scans/v1/borehole/scans/items/433157
SU88NE236	11	485700	186500	https://api.bgs.ac.uk/sobi-scans/v1/borehole/scans/items/21564089
SU88NW21	70	484640	185820	https://api.bgs.ac.uk/sobi-scans/v1/borehole/scans/items/433298
SU88NE153	12.5	485000	185700	https://api.bgs.ac.uk/sobi-scans/v1/borehole/scans/items/17118362
SU88NE18	7.9	485900	185730	https://api.bgs.ac.uk/sobi-scans/v1/borehole/scans/items/433171

3.2.1 Superficial Geology

The mapped superficial deposits in the Study Area consist of a fluvial glacial domain comprising alluvium, which is coincident with the corridor of the River Thames, and sand and gravels of the Shepperton Gravel Member and Taplow Gravel Member flanking the alluvium fan (Figure 3-5). These gravels and alluvium are all associated with the wider floodplain of the River Thames.

From the selected borehole logs (see Table 3-2), superficial deposits over the chalk have been described mainly gravels, with some layers of silty clay also identified on top of the gravels (likely alluvium).

From literature the Shepperton Gravel Member which underlies the floodplain are typically around 0 to 8m thick but locally can be up to 14m thick (BGS, 2025b). The Taplow Gravel Member which underlies the Shepperton Member is on average 5m thick but can be 9m locally (BGS, 2025c).

Borehole records indicate the superficial geology is generally <10m across the Study Area. Using the BGS Urban Interactive Model for London and Thames Valley, synthetic cross sections from east to west and north to south across the Study Area were created (see Figure 3-3 and Figure 3-4). From these, the alluvium is quite thin (approximately 2-3m) and is underlain by the Shepperton Gravel Member which has greater thickness of 5-10m. The north west cross section indicates that the Taplow Gravel Member outcrops at to the north with very minor thickness (<3m), and the Shepperton Gravel Member has a greater thickness of maximum 10m approximately.

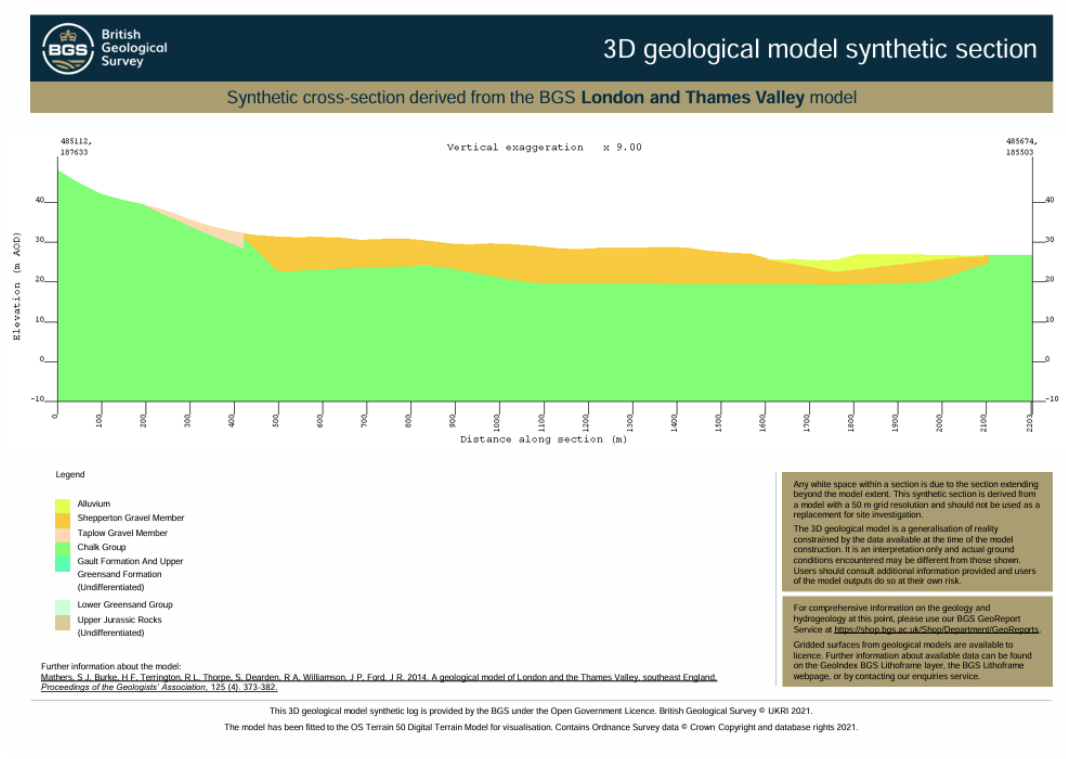


Figure 3-3. North to South Synthetic Cross Section

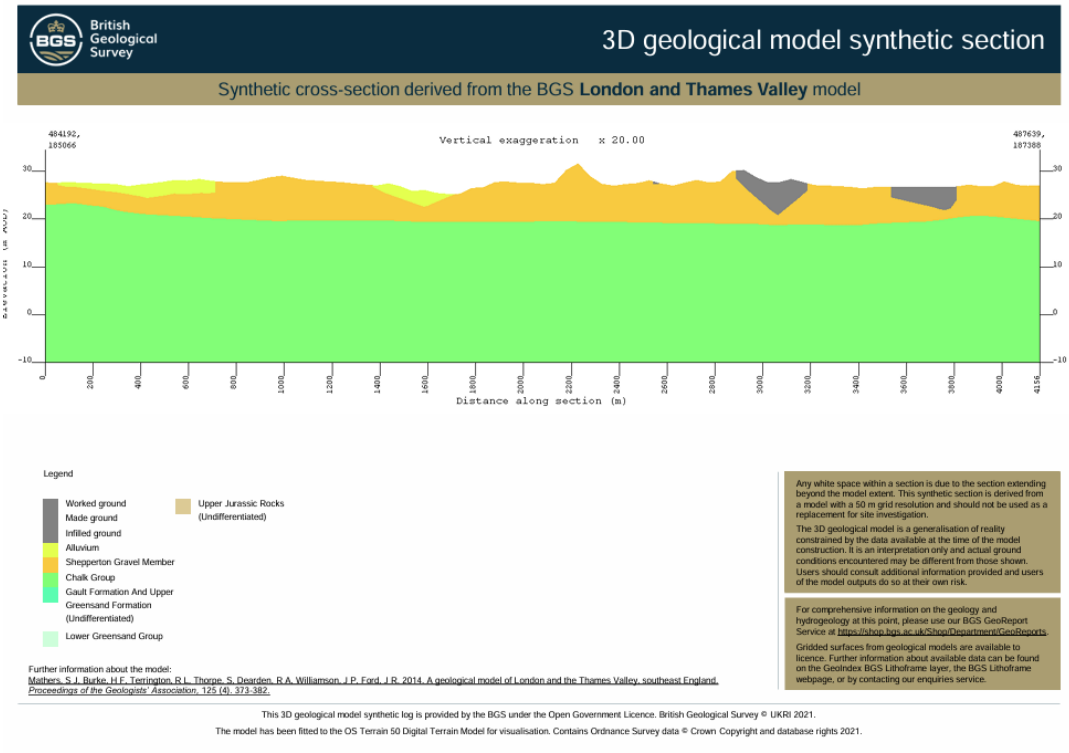


Figure 3-4. East to West Synthetic Cross Section

Table 3-2. Record of Superficial Deposits in Selected BGS Boreholes

Borehole BGS Reference	Depth to bedrock (m)	Superficial Deposit Description	Mapped Superficial Geology
SU88NE6	5.8	"Drift"	Taplow Gravel Member
SU88NE236	8.7	0 to 0.6m Topsoil 0.6 to 2.4m Firm reddish brown silty CLAY 2.4 to 4m Dense brown sandy medium to coarse flint GRAVEL 4 to 8.7m Medium dense brown sandy fine GRAVEL	Shepperton Gravel Member
SU88NW21	5.5	0 to 2.5m CLAY 2.5 to 5.5m GRAVEL with coarse SAND	Alluvium
SU88NE153	9	0 to 0.2m Topsoil 0.2 to 0.5m Brown sandy clay 0.5 to 1.7m Stone bits of clay and chalk 1.7 to 4.7m Brown sand and stones 4.7 to 9m Large gravel some sand	Shepperton Gravel Member
SU88NE18	7.9	0 to 0.3m Soil 0.3 to 1.8m Clay, silty, light grey yellow 1.8 to 7.9 Gravel and sand Gravel: coarse and fine with some cobbles, subangular to well-rounded flint, well rounded quartz and quartzite with some sandstone and traces of limestone and chalk. Sand: coarse with medium and traces of fine, mainly flint quartz.	Alluvium

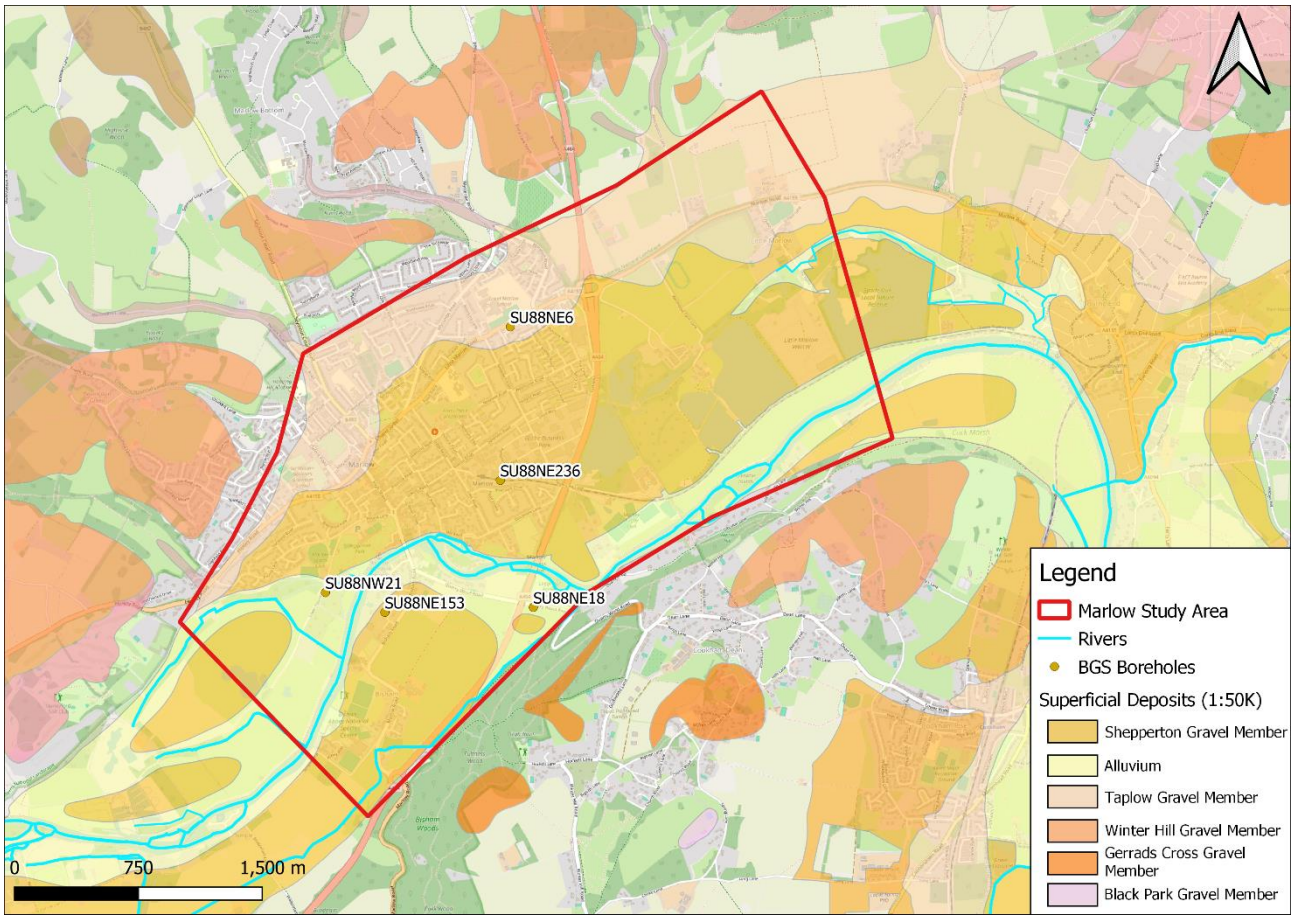


Figure 3-5. Superficial Deposits (1:50k)

3.2.2 Bedrock Geology

BGS (2025a) has mapped the bedrock geology, to a 1:50,000 scale, underlying Marlow as the New Pit Chalk Formation, with areas to the south and north of the town at higher elevations mapped as the Lewes Nodular Chalk Formation (Figure 3-6). Within Marlow the younger formations have been eroded away to expose older formations (i.e. New Pit Chalk) at the surface. To the north and south of Study Area, younger chalk formations are found on the valley slopes; Lewes Nodular Chalk and Seaford Chalk. The younger Lambeth Group outcrops to the south of the A404, and there is an outcropping of youngest unit, London Clay, found to the far south.

Selected BGS borehole records indicate that chalk, where encountered, is as shallow as 2.4 m bgl (in the southwest around Pens Place on Lower Pound Lane), with the majority of locations across the Study Area recording chalk at less than 10mbgl.

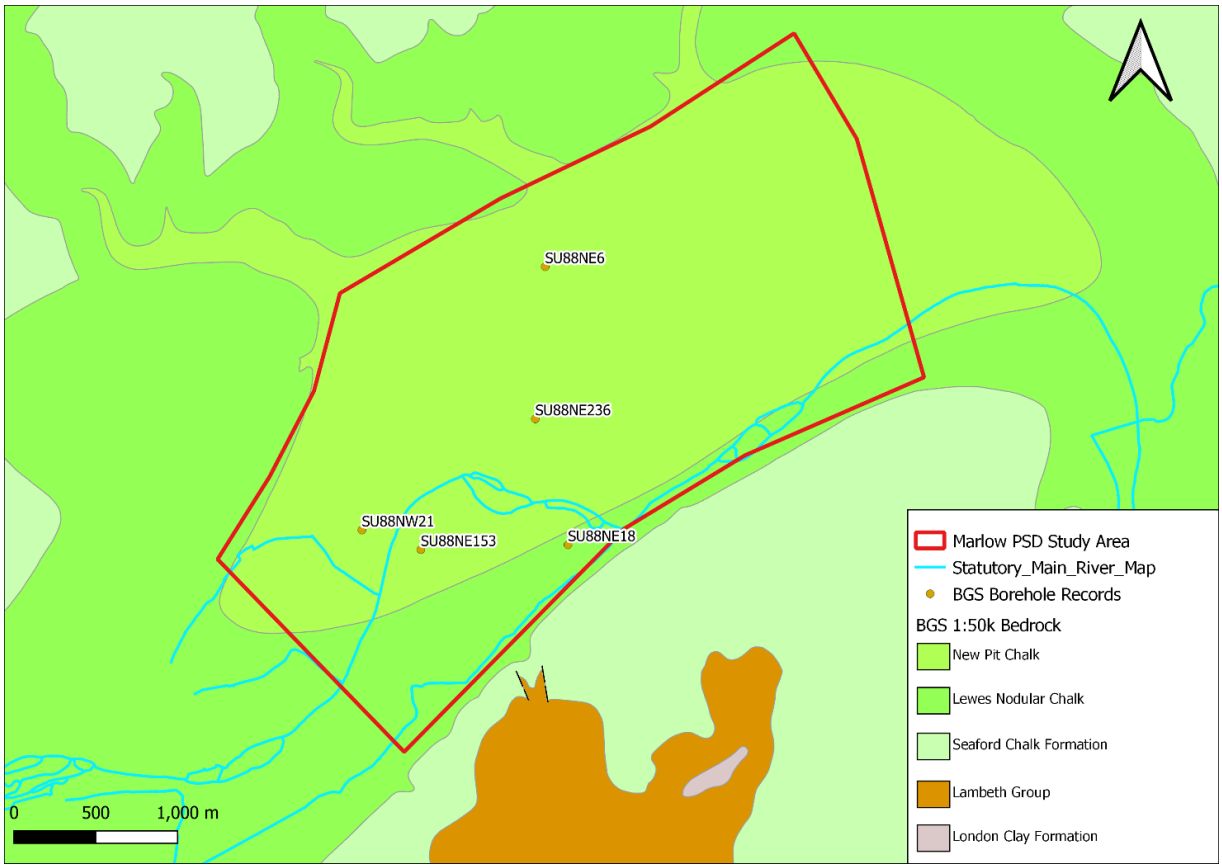


Figure 3-6. Bedrock Geology (1:50k)

3.2.3 Hydrogeology

All the superficial deposits are classified as Secondary A aquifers which comprise permeable layers that can support local water supplies, and may form an important source of base flow to rivers (DEFRA, 2025). Given the permeable nature of the superficial deposits, they likely interact closely with the underlying chalk aquifer, especially in the low-lying areas of the floodplain of the River Thames.

Both the New Pit Chalk Formation and the Lews Nodular Chalk Formation are classified as principal aquifers which provide significant quantities of drinking water, and water for business needs (DERFA, 2025). They may also support rivers, lakes and wetlands. Groundwater in the chalk will generally move from the surrounding Chiltern Hills south towards the River Thames in the Study Area.

Within the chalk groundwater will flow through both the matrix and fractures, however most flow will be derived from fracture flow. Within the Chilterns area chalk has a median transmissivity of 860m^2/day with a hydraulic conductivity of around 45.4m/day (BGS, 2025d).

3.3 Hydrological Data

3.3.1 Groundwater Level Data

Table 3-3 details groundwater level data that is available for long-term monitored boreholes in proximity to the Marlow area. No monitoring locations are located within Marlow itself.

There is a lack of groundwater level data from the superficial deposits within the Marlow area, however within the wider operational catchment there are six EA monitoring locations within the chalk four of which record

continuous data and two through (on average) monthly manual dips (Environment Agency, 2025a). The six stations are detailed in Table 3-3 and shown in (Figure 2-1),

Table 3-3. Environment Agency Groundwater Monitoring Borehole

Station	Measurement	Start of recordings	Depth (m)	Datum (mAOD)	Aquifer	Maximum Groundwater Level (mBGL)	Minimum Groundwater Level (mBGL)
Fawley Green	Manual	18 April 1955	103.03	149.09	Chalk	85.17	103.36
Ray Farm	Continuous	25 October 2011	33	73.8	Chalk	18.46	31.2
	Manual	28 February 1984					
Poynatts Manor	Manual	18 April 1955	16.66	75.44	Chalk	2.80	54.4
Hamble Brook	Continuous	7 December 1998	30	38.06	Chalk	4.07	7.03
	Manual	26 April 1998					
Hambleden	Continuous	15 March 1996	30.48	40.95	Chalk	0.14	5.31
	Manual	29 April 1966					
Stonor Estate	Continuous	29 January 2015	77	122.96	Chalk	34.07	60.61
	Manual	8 April 2015					

It is thought that given the gravelly, permeable nature of the superficial deposits, they are likely to be hydraulically linked to groundwater in the underlying chalk. Therefore, for the purpose of this reporting, information on groundwater trends within the chalk likely also apply to the overlying gravels, albeit with slightly different amplitudes of response likely.

It is therefore not possible to produce a groundwater contour map of the Study Area and wider catchment due to the limited spatial and temporal data on groundwater levels. However, from the groundwater level data in the chalk it is observed that groundwater levels in each of the monitored location have synonymous trends, albeit varying amplitudes (Environment Agency, 2025a).

Groundwater monitoring boreholes which are closer to the River Thames (Hambleden and Hamble Brook) evidence a shallower water table, with levels at Hambleden between 1m bgl and 5m bgl, and at Hamble Brook between 4m bgl and 6m bgl. Further uphill in the catchment groundwater levels in the chalk are deeper at depths on average between 20 and 100m bgl (Figure 3-7). At Hambleden and Hamble Brook where groundwater levels are much shallower, it is likely that they interact with the overlying superficial deposits which in this area are head (gravel) deposits. Groundwater levels within the Marlow area are likely to be similar to those at Hambleden and Hamble Brook given that they are in similar positions relative to the river, topography, and geology.

There are no rainfall monitoring locations within the same topographical catchment as Marlow therefore comparisons between rainfall data and groundwater levels are difficult to identify as there is no catchment

specific rainfall data. The nearest rainfall station is approximately 14km north of the Study Area in Stokenchurch and given the higher elevation will not be reflective of rainfall in lower elevations.

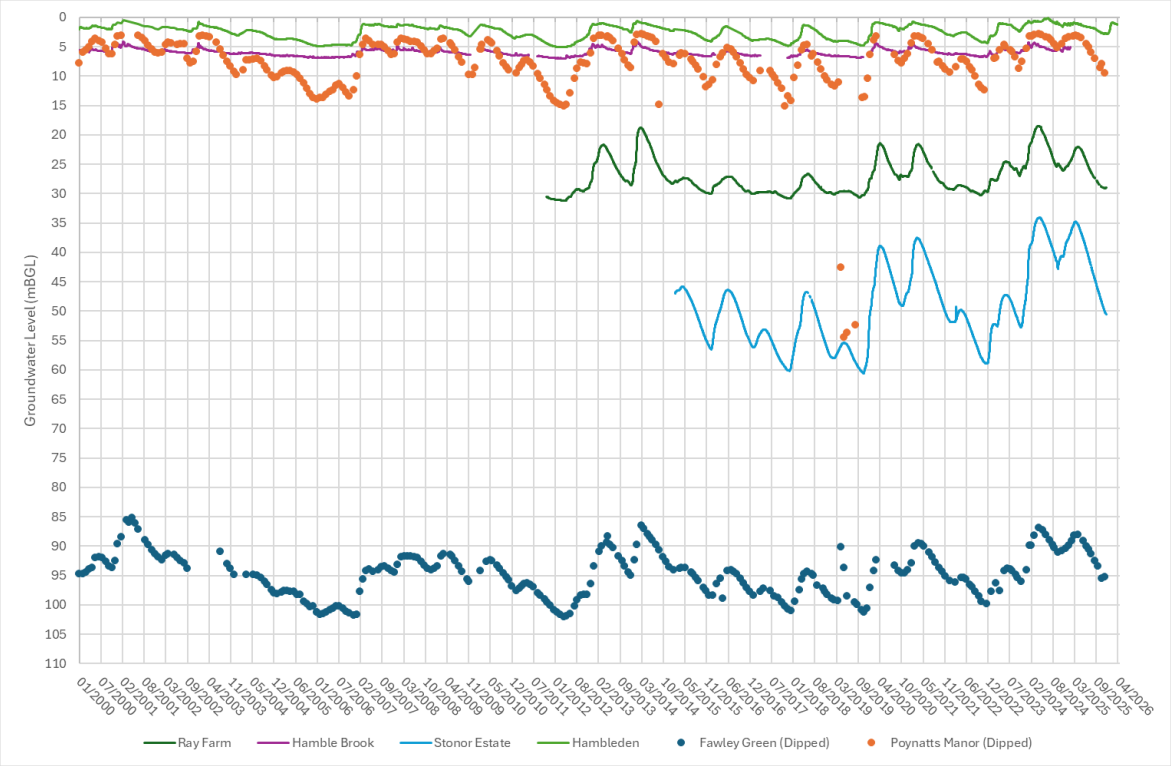


Figure 3-7. Groundwater levels in metre below ground level (m bgl)

3.3.2 Surface Water Level Data

Levels in the River Thames (and within the study area) are measured at multiple locks along its course and those relevant to the Study area are presented in Table 2-1 and Table 3-4 (Environment Agency, 2025a).

Two additional upstream level stations on the Thames, outside of the study area, have also been inspected; Twyford and Blakes Lock.

The river level stations show flashy responses around the time of the flood events, see Figure 3-8.

Twyford station on the Loddon has typically higher water levels with greater range in levels. Blake station by comparison has fairly modest rises during flashy events. Marsh, Marlow, and Hurley Lock tend rise by under 1m (depending on intensive of rain event) during flashy events.

Table 3-4. Environment Agency River Level Monitoring Stations

Station	Measurement	River	National Grid Reference	Start of recordings	Maximum Level above Gauge Datum (m)	Minimum Level above Gauge Datum (m)
Marlow Lock	River Level	Thames	SU 8540 8610	12 February 2002	1.239 (10/02/2014)	0 (23/09/2022)
Hurley Lock	River Level	Thames	SU 8272 8428	11 February 2007	0.531 (07/01/2024)	-3.312[(1)] (24/05/2025)

Station	Measurement	River	National Grid Reference	Start of recordings	Maximum Level above Gauge Datum (m)	Minimum Level above Gauge Datum (m)
Marsh Lock	River Level	Thames	SU 77415 81673	29 November 1995	3 (03/04/1996)	0.015 (20/02/2015)
Twyford	River Level	Loddon	SU 77811 76794	22 November 1994	2.827 (08/11/2000)	0 (30/09/2002)
Blakes Lock	River Level	Kennet	SU 72734 73532	01 January 1991	0.822 (14/12/2000)	-0.096 (14/11/1997)

(1) Data possibly erroneous. Next minimum is 0.011m

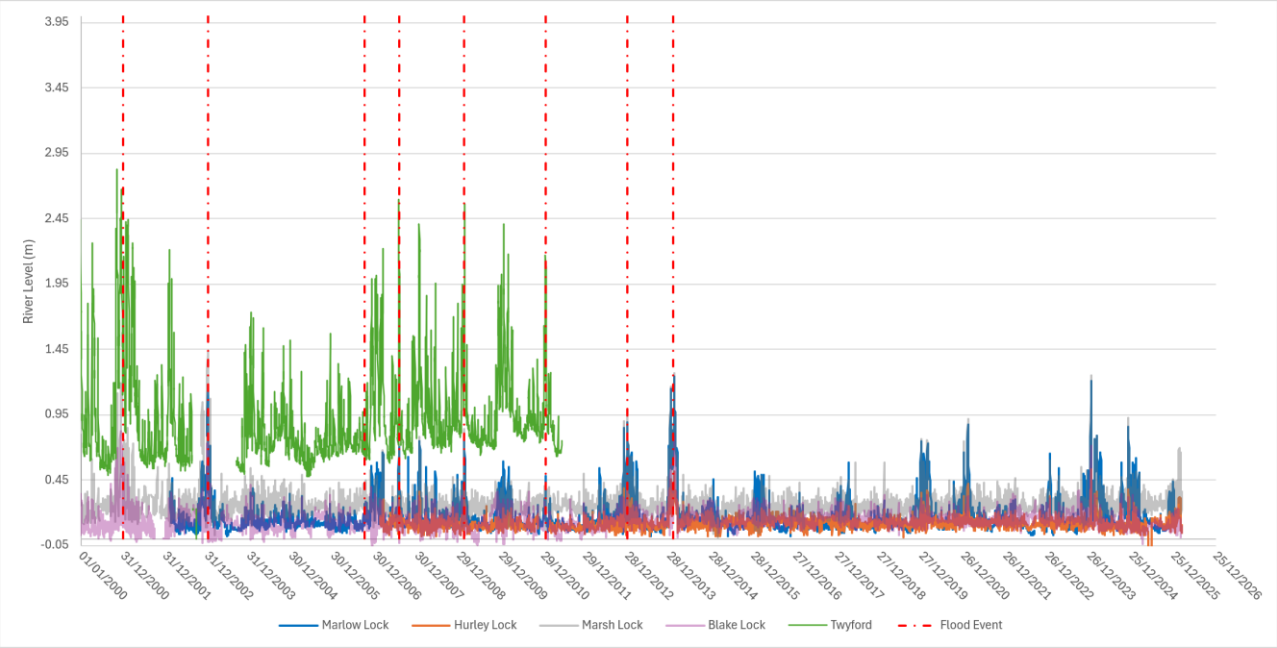


Figure 3-8. Surface Water Levels in Metres Above Gauge Datum

3.3.3 Groundwater-surface water interaction

Levels at Marlow Lock were compared to those at two groundwater monitoring locations (Hambleden and Hamble Brook) located upstream of Marlow but in proximity to the River Thames (see Figure 3-9). There is a positive correlation between groundwater levels in these boreholes and river levels suggesting a strong hydraulic connection between surface water and groundwater in the chalk, and hence gravels, in this area. Additionally, there appears to be no perceptible lag between groundwater and surface water level rise.

Level data is provided for four pumps in Marlow, however given the distance of the groundwater monitoring points from these pumps the data is unlikely to be comparable. The pumps likely have small radius of influence so will not impact levels in the available monitoring boreholes.

From the groundwater level data, areas closer to the River Thames where the chalk is known to be at shallow depths show more muted responses, of a magnitude similar to that of changes in the river level (see Figure 3-10). For example, river water rise of 0.7m in the January / February 2014 flood event resulted in a rise in groundwater levels at Hambleden and Hamble Brook (located 1.2km and 720m north of the river) of 0.5-

0.9m. Levels fall and rise together because the surface water and groundwater in the floodplain are hydraulically connected.

In the upper catchment at the remaining four groundwater monitoring locations (Ray Farm, Poynatts Farm, Stonor Estate and Fawley Green) groundwater levels also show a correlation to levels in the River Thames, with similar trends to those boreholes at Hamble Brook and Hambleden (see Figure 3-10). However, the responses are shown to be much higher than those in the River Thames (of a magnitude of several metres compared to just under 1m in the River Thames), suggesting that in these locations further up in the catchment the groundwater is responding directly to rainfall. In chalk aquifers, dual porosity can result in high amplitude responses in groundwater levels; the aquifer is very saturated during winter (matrix) and fracture features allow rapid response of water table to rainfall recharge. The seasonal response in the chalk aquifer is most apparent in Stonor Estate and Hambleden monitoring locations which show yearly lows in October and groundwater annual highs in February as aquifer storage increases during the autumnal to winter recharge (see Figure 3-11).

As rainfall also drives levels in the River Thames the trend in level rises and falls will be the same in both the groundwater in the upper catchment and the river but at different amplitudes, whereas the groundwater closer to the river (i.e. in the floodplain) will be linked directly to the river through the permeable geology so will have rises and falls of similar magnitude to the river.

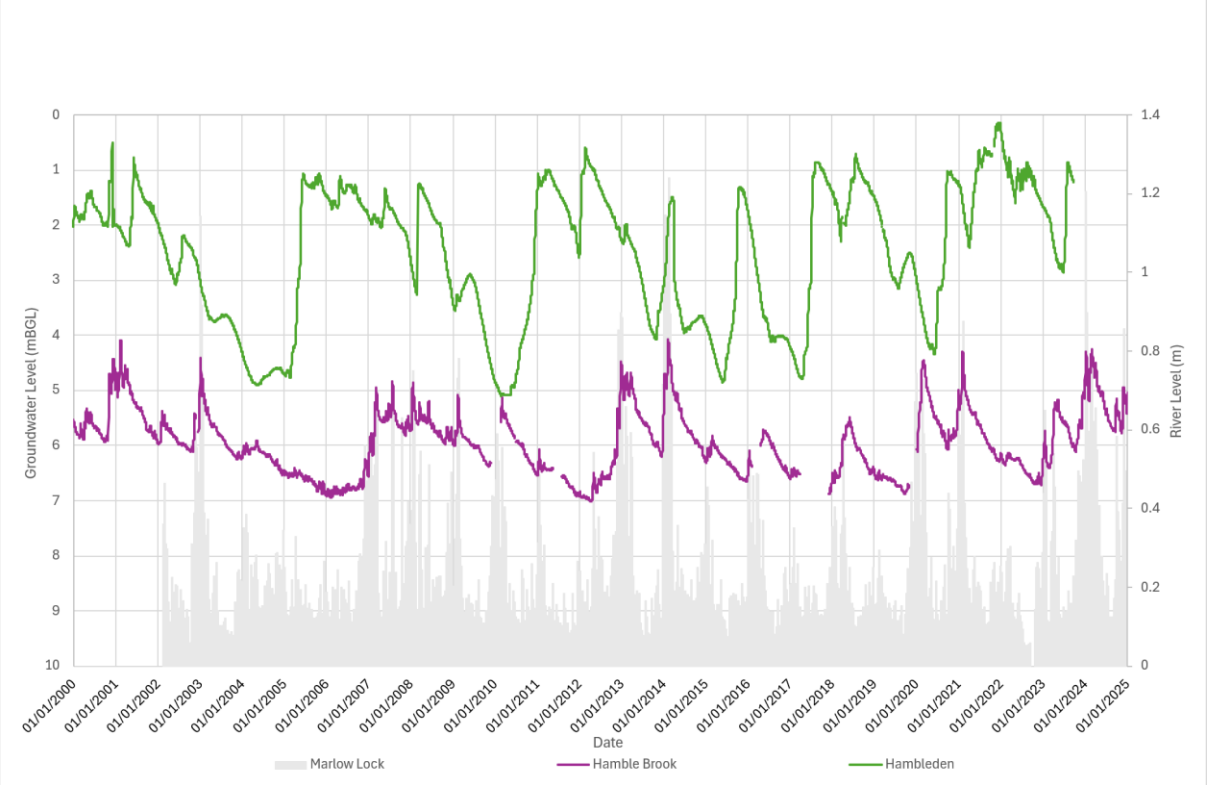


Figure 3-9. River Levels in the Thames against groundwater levels at Hambleden and Hamble Brook

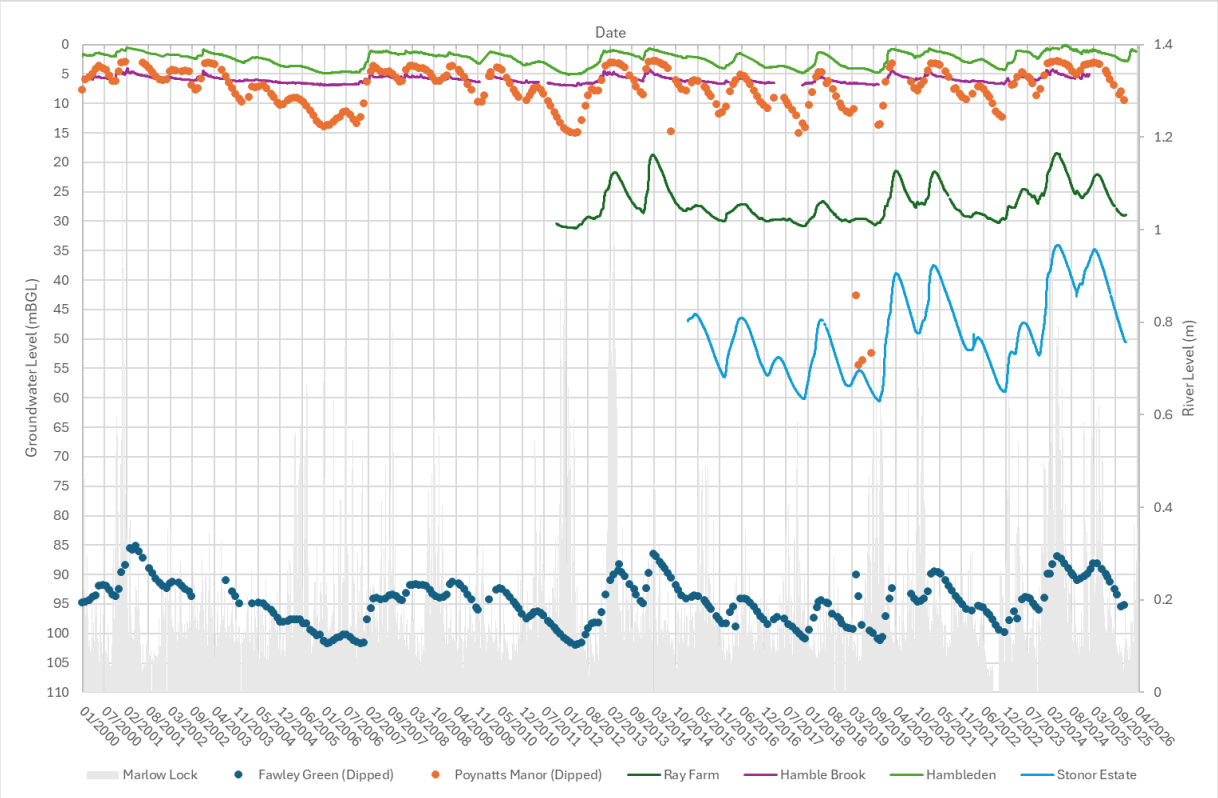


Figure 3-10. Groundwater Levels in the Catchment Against River Levels in Marlow Lock

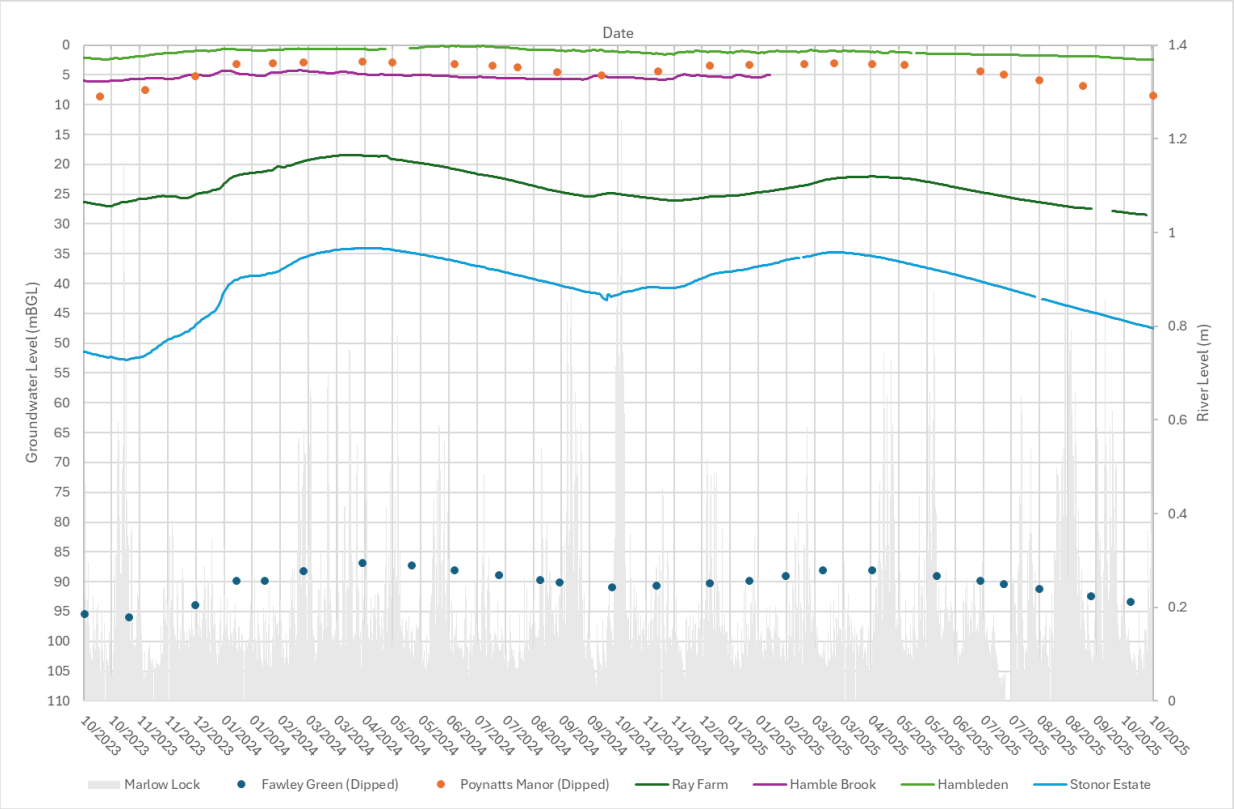


Figure 3-11. Groundwater levels against Marlow Lock River Levels (seasonal)

Along the River Thames the baseflow index (a hydrologic measure showing the proportion of a river's total flow that comes from long-term groundwater storage) ranges from 0.67 at Thames at Reading to 0.73 downstream at Thames at Maidenhead (NFRA, 2025a) (NFRA, 2025b). This is a marginal increase but demonstrates that the river (during normal conditions) is a gaining river; it increases its water volume as it travels downstream because it receives groundwater discharge (for example via point discharges from chalk stream tributaries or transmission from groundwater). Groundwater levels within the upper catchment are at much higher elevations than the River Thames, hence once recharged the groundwater likely flows south towards the river via dry chalk valleys to contribute as baseflow to the Thames.

Monitoring during high flow periods (discussed in Section 3.3.3 below) show that river levels rise. Groundwater level response is coincident with the river level rise, as seen in the monitoring boreholes in the Chalk. It is likely that high rainfall events both cause rapid recharge in the Chalk as well as run-off into the Thames, causing river level rises further down the catchment.

3.3.4 Surface Water Levels and Groundwater Responses During Flood Period

Based on information provided by residents, the Section 19 Report for 2014, and confirmed though comparisons with hydrological data since 2000, there have been eight flood events which have had an impact on Marlow (Buckinghamshire County Council, 2015). The approximate dates of the flood peaks were as follows:

- Winter 2000/2001 (29th December 2000)
- 4th January 2003
- Autumn 2006
- 27th July 2007
- 13th February 2009
- Winter 2010/2011 (19th January 2011)
- 27th December 2012
- 23rd January to 6th February 2014

Groundwater level data from January 2000 to December 2014 shows six periods where high groundwater levels coincide with the aforementioned known flood events (shown in red dashed lines in Figure 3-12).

There is no rainfall data for the Marlow area; rainfall data is only available for other sub-catchments within the Thames. Note, Marsh Lane rainfall station is the closest station to the Study Area (approx. 9km south), however this is a downstream catchment and unlikely to be reflected in river levels upstream. Also, recordings did not begin at this station until 2018 which is after all flood events are known to occur so no comparison can be made.

It is noted that there are times when groundwater levels are higher than those during noted flood events however, no flooding appears to have occurred during these times. Therefore, it is likely that within the Study Area groundwater is not the primary mechanism for flooding but rather exacerbates conditions during fluvial flooding.

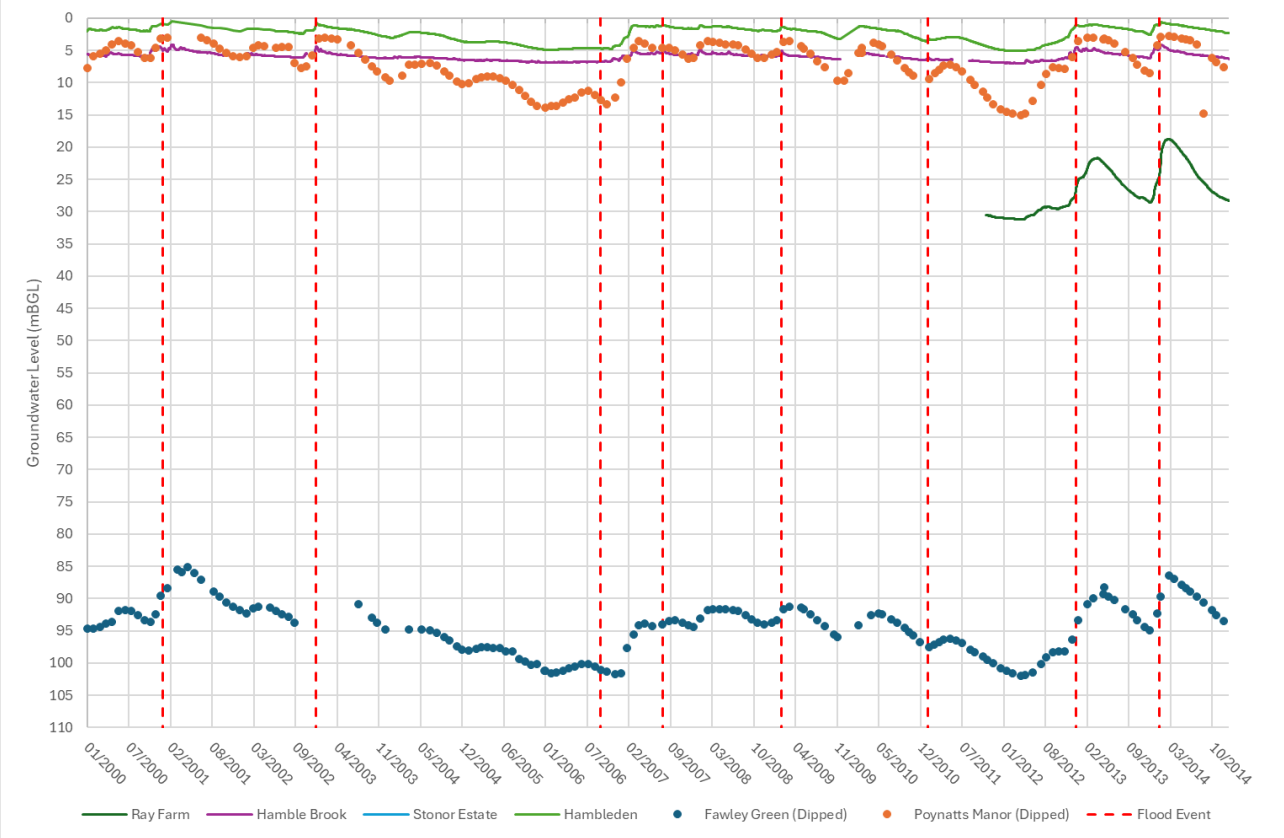


Figure 3-12. Groundwater Level Time Series for Wider Catchment With Major Flood Events

On four of these occasions' groundwater flooding also occurred and affected properties and in some cases the sewage network (Buckinghamshire County Council, 2015). However, it is noted that groundwater flooding can be masked by other flood mechanisms and that there could be more occurrences of groundwater flooding during other flood events that have not been reported.

A comparison of all flood events (listed above) with river levels in the River Thames show correlation, with the highest recorded levels in the Thames coinciding with flooding incidents (Figure 3-20). However, it is noted that on some occasions where flood events were recorded the water levels were not at their peak suggesting some other mechanism for flooding, especially in the 2006 and July 2007 events where higher levels in the Thames prevailed in the following months but no flood events were recorded after the main flood event in July 2007.

Note, some of the flood events pre-date the operation of river level stations and are thus not illustrated in the figures.

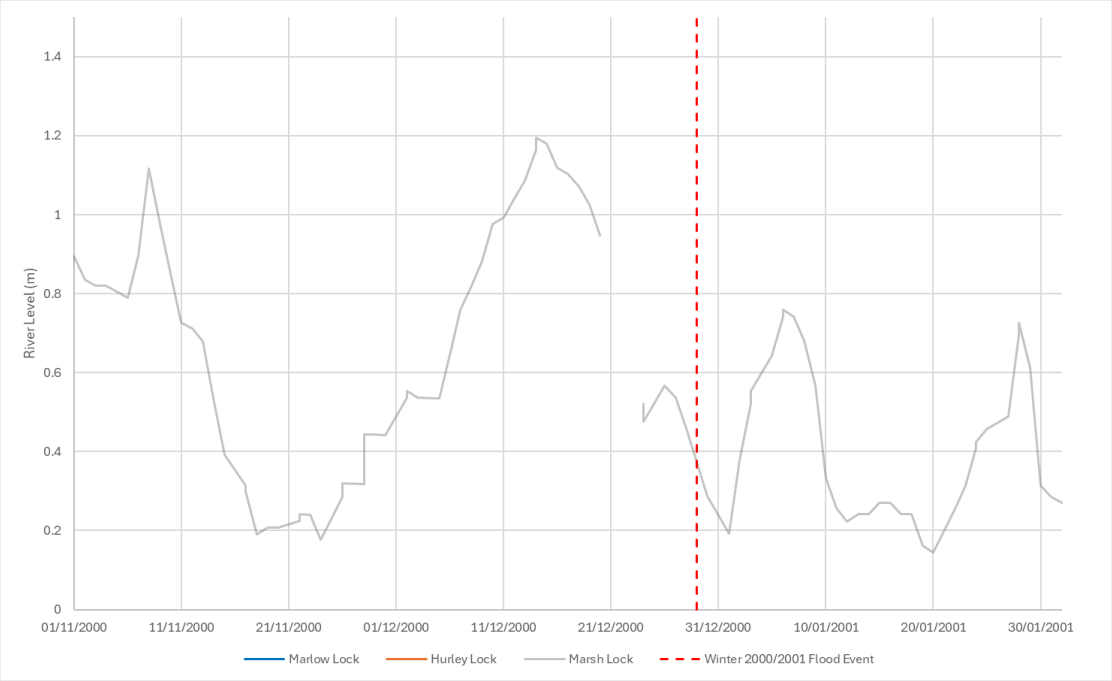


Figure 3-13. River Level in the River Thames at Various points along the watercourse during the Winter 2000/2001 Flood Event

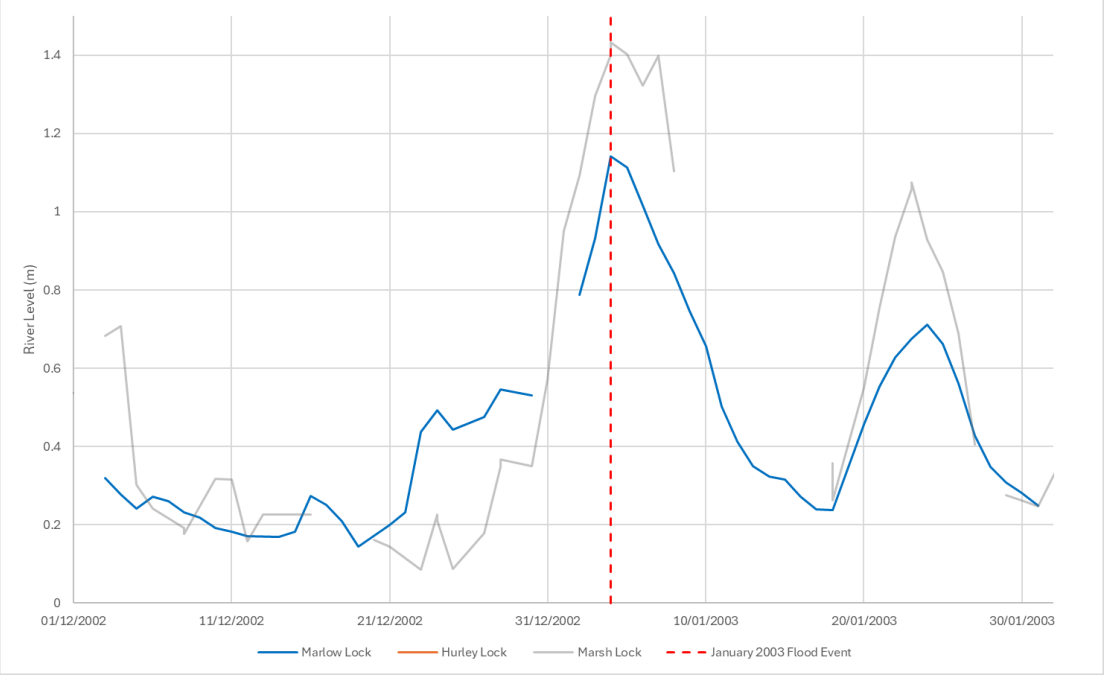


Figure 3-14. River Level in the River Thames are Various points along the watercourse during the January 2003 Flood Event

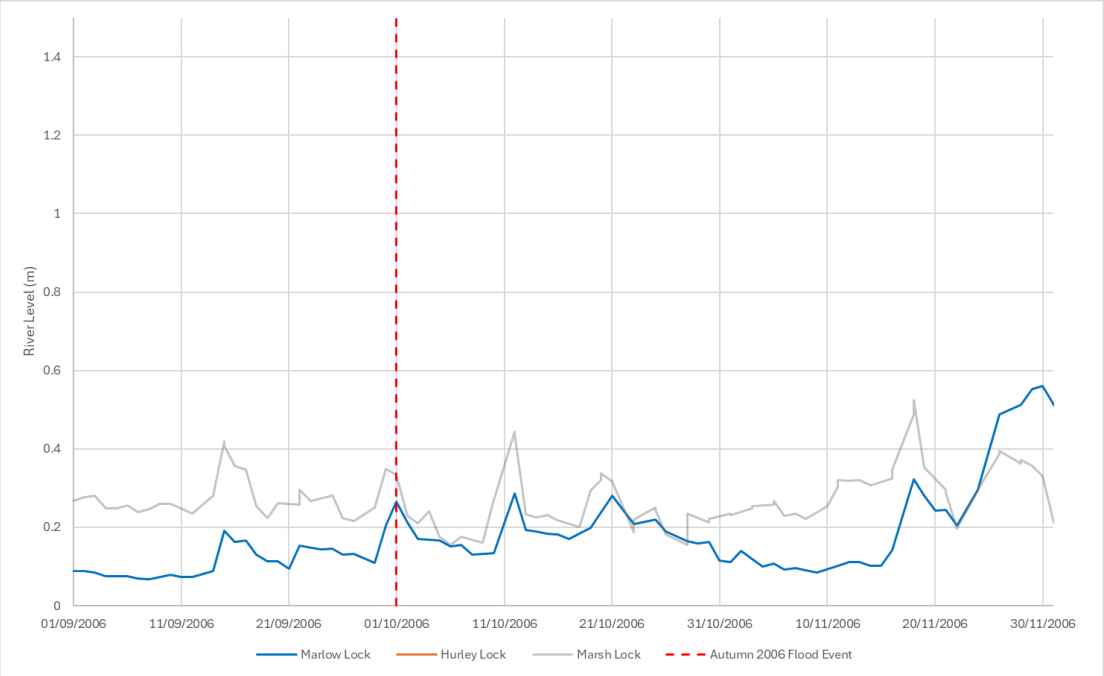


Figure 3-15. River Level in the River Thames at Various points along the watercourse during the Autumn 2006 Flood Event.

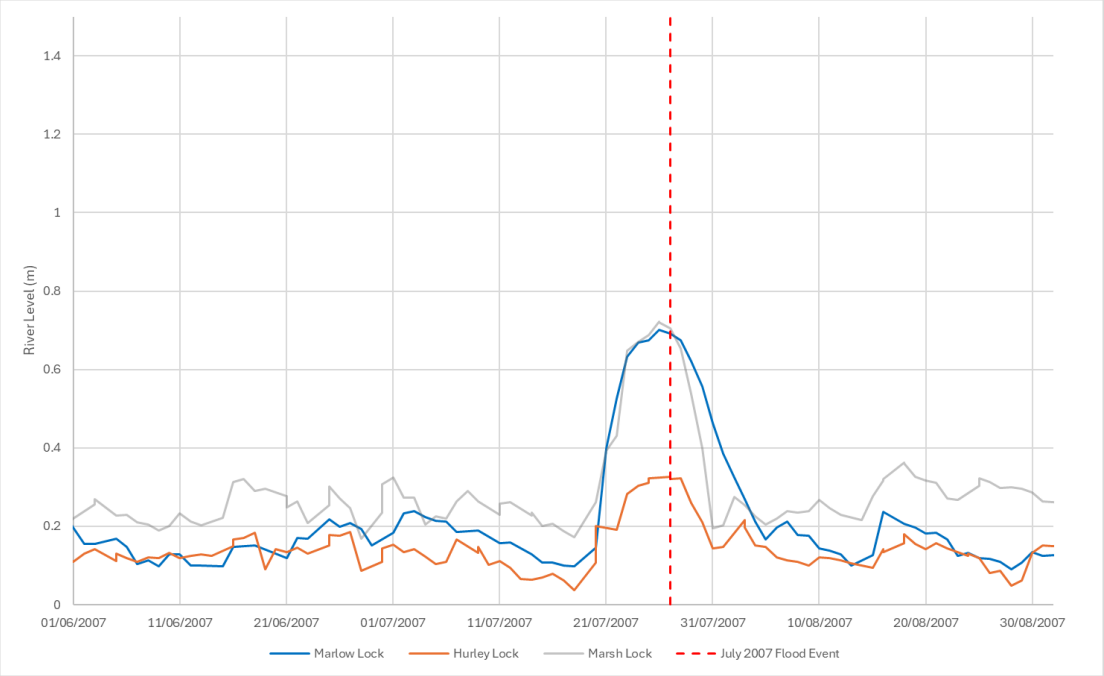


Figure 3-16. River Level in the River Thames at Various points along the watercourse during the July 2007 Flood Event.

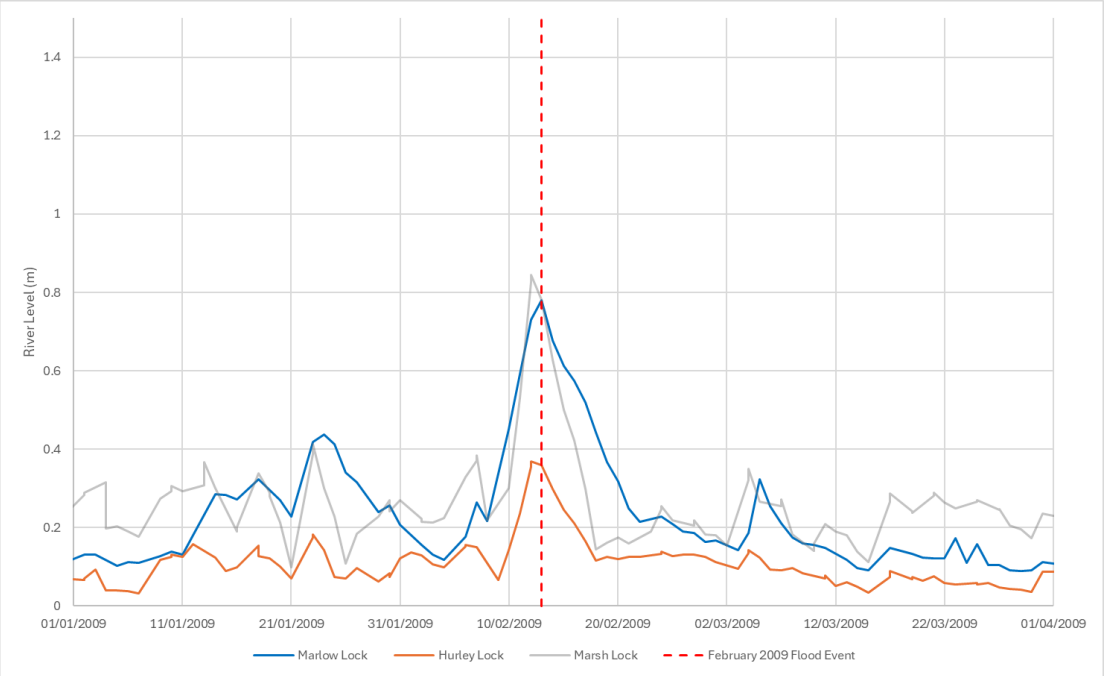


Figure 3-17: River Level in the River Thames at Various points along the watercourse during the February 2009 Flood Event.

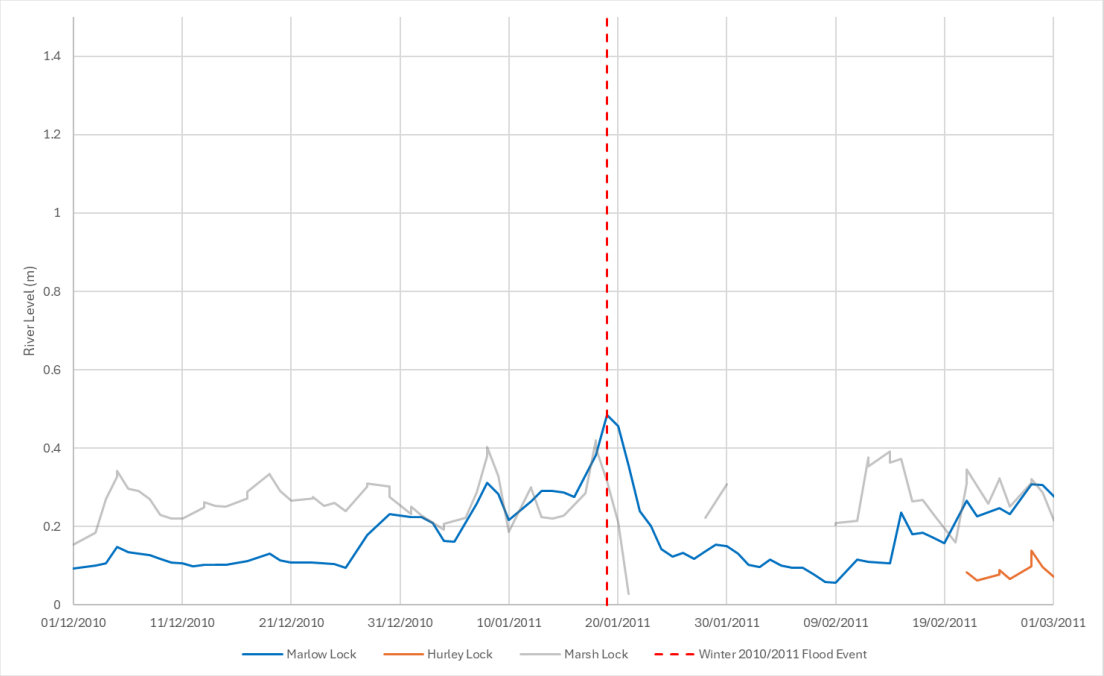


Figure 3-18: River Level in the River Thames at Various points along the watercourse during the Winter 2010/2011 Flood Event.

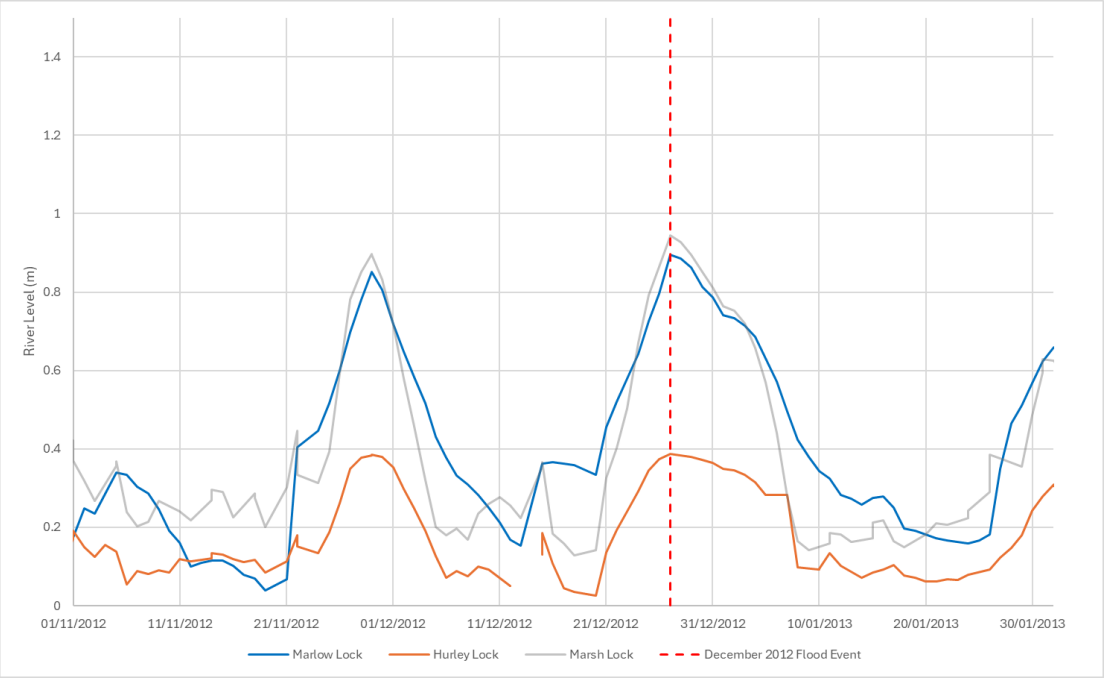


Figure 3-19: River Level in the River Thames at Various points along the watercourse during the December 2012 Flood Event.

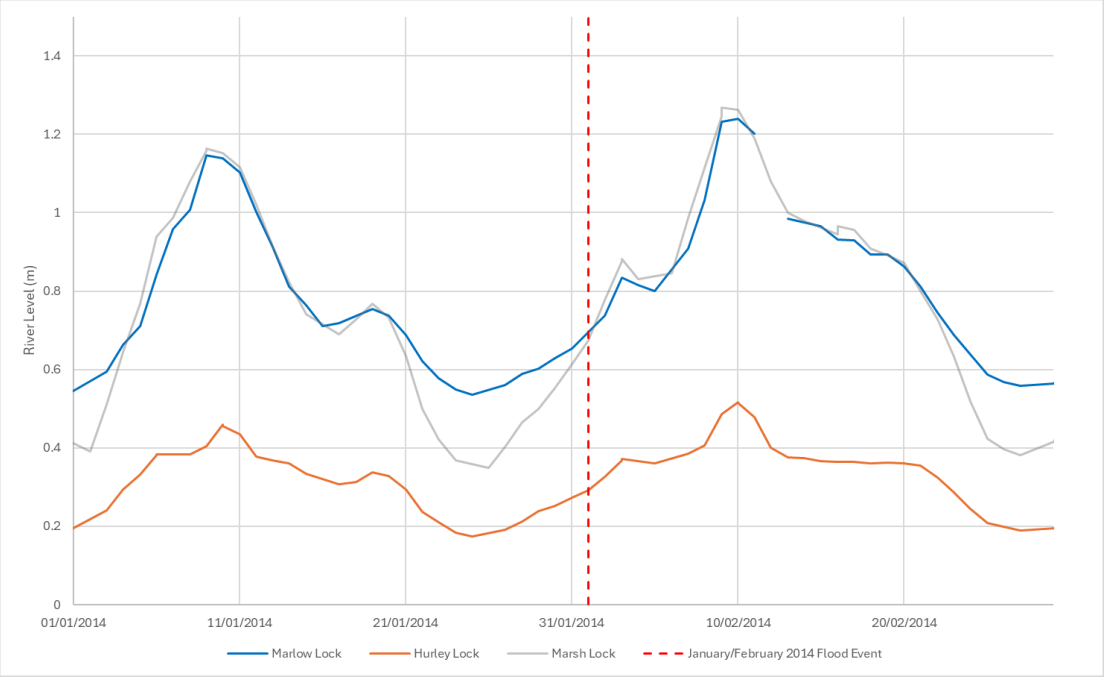


Figure 3-20. River Level in the River Thames at Various points along the watercourse during the January/February 2014 Flood Event

3.3.4.1 Flooding in 2007 and 2014

An analysis of flood hydrographs for flood events from 2007 and 2014 in particular (due to these events having the most complete monitoring records) shows that the shapes of the river hydrographs during floods are dependent on the duration and magnitude of rainfall in the catchments of the River Thames, the River Kennet and the River Loddon. Figure 3-22 illustrates the rainfall at selected stations within adjacent

catchments that was the driver for the flood events in July 2007 and 2014 and surface water level monitoring stations for each event.

2007

In the 2007 hydrograph, the Loddon has a flashier response to rainfall, which could be due to its higher baseflow index as a result of the river flowing through a predominantly chalk catchment in its upstream reaches. The monitoring points at Marsh and Marlow Lock also show flashier responses to rainfall however this could be due to these monitoring points being located at the discharge point of multiple dry chalk valleys located to the north of Marlow which flow into the Study Area.

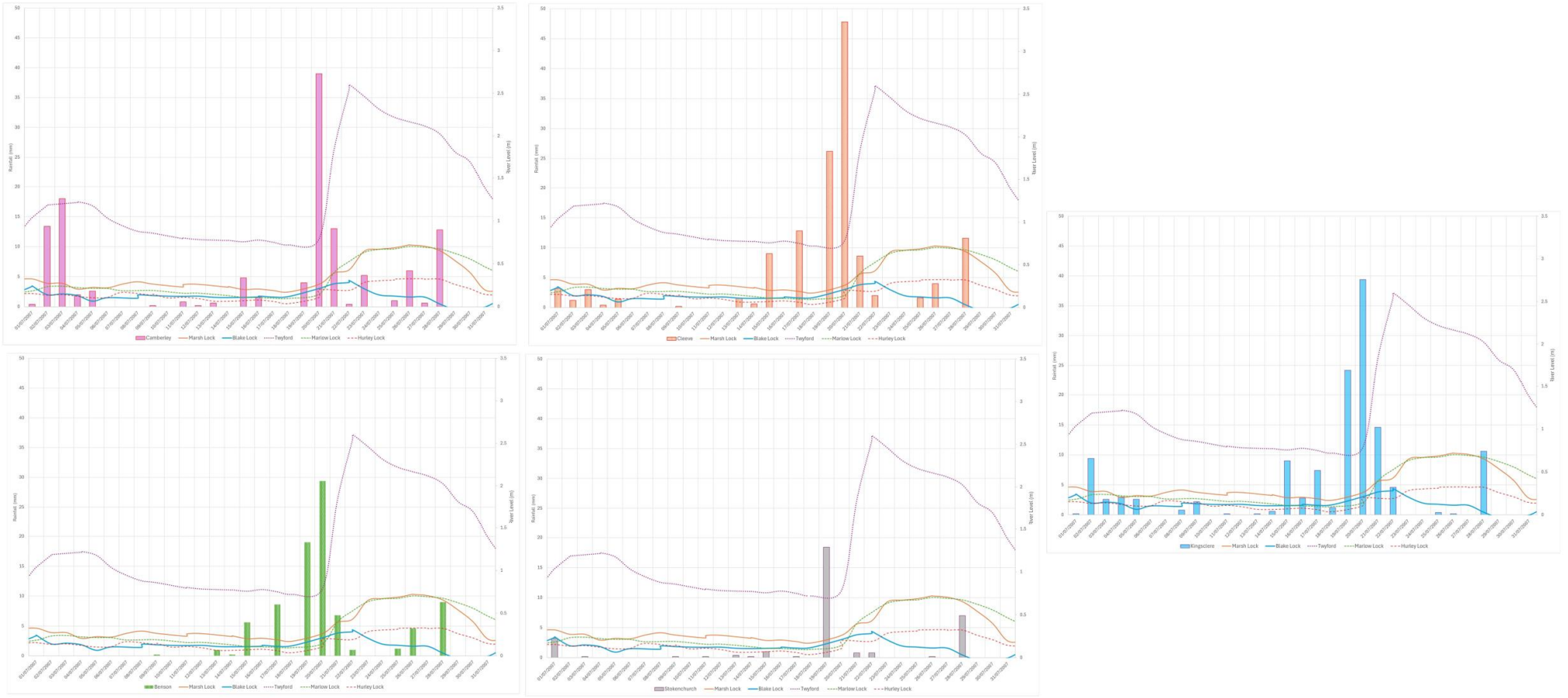


Figure 3-21. Hydrograph in the Loddon, Kennet and Thames and Chiltern South WFD Operational Catchments (2007 Flood Event)

2014

In the hydrographs from 2014 there are two peaks in river levels with peaks at the Loddon (Twyford) and Kennet (Blakes Lock) surface water monitoring locations slightly before the peaks at various location along the Thames. These peaks are a response to higher rainfall, with a lag of a few days before peak river levels are reached. This response time is the same for the 2007 event where the peaks in the Loddon and Kennet are seen before the peaks in the Thames.

During both the 2007 and 2014 flood event Twyford monitoring point on the River Loddon has the most notable response to rainfall (changes of up to 1.5m in level). This could be due to a large part of the Loddon catchment being underlain by unproductive London Clay hence more water is likely to runoff into the river as there will be less infiltration into underlying aquifers.

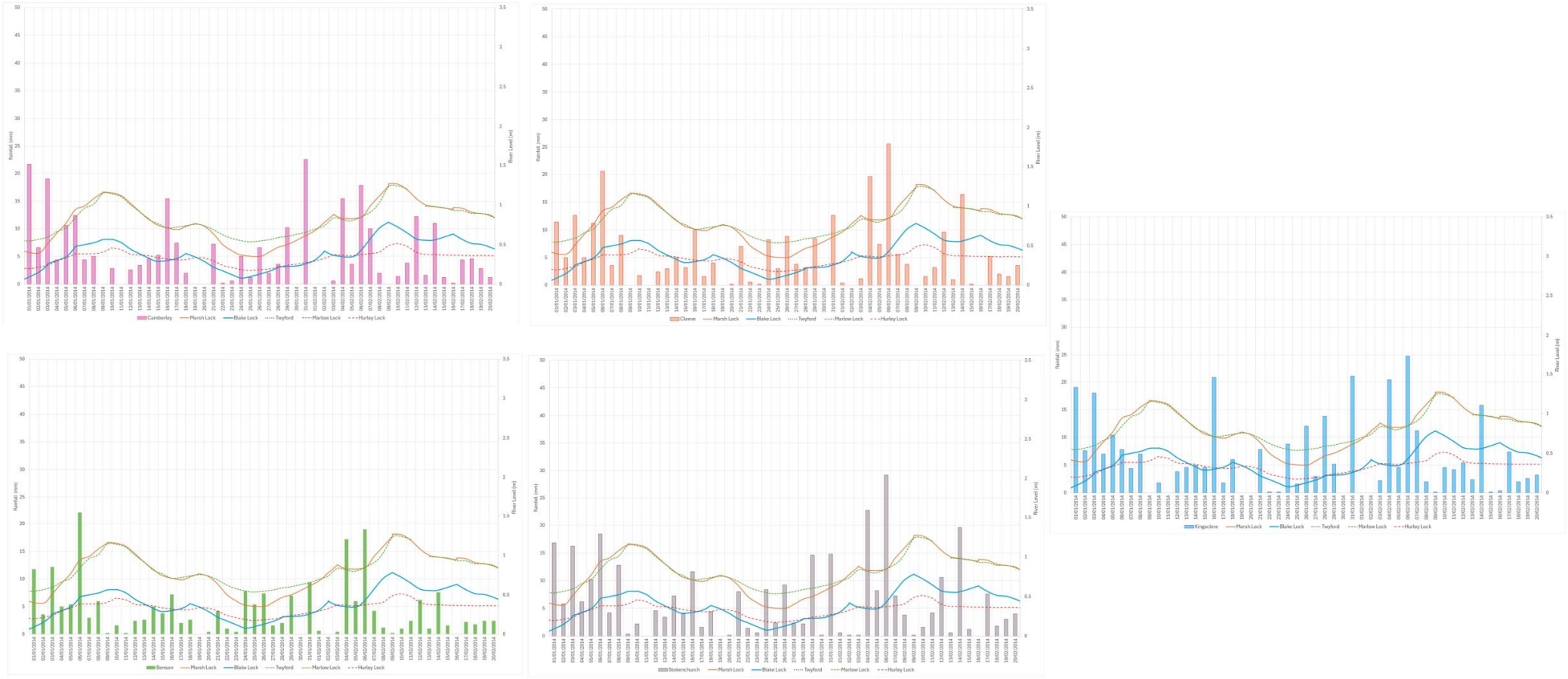


Figure 3-22. Hydrograph of the Loddon, Kennet and Thames and Chiltern South WFD Operational Catchments (January/February 2014 flood event)

3.4 Flood impact and protection measures

The flood conceptualisation section will describe and detail the chronology of a typical flood event. In advance, as context, it is worth identifying that measures have been put in place in Marlow since 2015 in response to flooding. These measures have predominantly been for fluvial flooding with some measures, implemented for groundwater flooding.

3.4.1 Sewerage and stormwater system

One impact of groundwater flooding is the inundation of the sewerage system due to the ingress of groundwater as levels rise. This can lead to sewers surcharging and flooding, contaminating flood waters. Additionally, due to reduced capacity in the sewerage network it becomes unusable.

During the 2014 flooding issues with sewage occurred around St Peter Street, Mill Road, Lock Road, Gossmore Close and Gossmore Lane in east Marlow (Buckinghamshire County Council, 2015). Residents on Firview Close also reported issues with the sewer system but not of contaminated water. Around Quarrydale drive, flood waters reportedly became contaminated with sewage (Buckinghamshire County Council, 2015).

In east Marlow, surface water runoff is managed via a piped drainage network which discharges into Newt Ditch (which is the only other recognised watercourse in Marlow designated as an ordinary watercourse). This ditch is partially culverted and where it crosses under the A404, the culvert can become overwhelmed and, in some cases, blocked with debris and sediment hence limiting flow through it. This can lead to water backing up the system causing localised flooding around Dedmere Road, The Croft, Quarrydale Drive and Fieldhouse Lane. Plans to reduce this flood risk are described in Section 2.2.

The Section 19 Report notes that within Marlow, gravels are utilised for infiltration drainage as part of the surface water management through soakaways (Buckinghamshire County Council, 2015). Within Marlow key soakaway areas are located in the estates between Seymour Court Road and Little Marlow Road, the estates between Little Marlow Road and Dedmere Road, the Globe Park and Pound Lane (Buckinghamshire County Council, 2013). In general, many of the soakaways to the south of the A4155 are shallow and have poor infiltration due to existing high groundwater levels which reduces storage capacity. In times of a flood event when groundwater levels are high, the aquifer becomes saturated and infiltration rates reduce. This can lead to water being unable to soakaway leading to localised flooding around East Marlow and Pound Lane. To help remove excess water in times of high groundwater levels, Pound Lane has three satellite pumps to collect surface water in sumps and discharge via one large pump to the River Thames. This system is automated and operated when trigger levels are reached. These pumps were installed to take excess surface water runoff but do pump excess groundwater and can become overwhelmed at times as they are not sized to take surface and groundwater flows. Additionally, groundwater pumps have been installed in East Marlow to also pump away excess groundwater in times of flooding.

It is likely that under normal conditions that the sewage and stormwater system could help to alleviate high groundwater levels by carrying excess water away, however there is currently no data on groundwater levels in the gravels to either confirm this.

3.4.2 Basement flooding

There is not currently information on basement flooding within the Marlow area. During the public events (Section 2.3.4) no residents mentioned occasions of basement flooding when talking about past flood events.

However, it is possible that basement flooding occurs within the area due to the likely shallow nature of groundwater, with occurrences of groundwater coming up through airbricks at the base of buildings noted by residents. It could also be the case that the properties in this area do not have basements due to the high risk of groundwater flooding.

3.4.3 Direct inundation from fluvial flood waters

During a major flood event the level of the River Thames rises, leading to overtopping of the banks, mainly around Pound Lane and Gossmore Lane. Raised walls and earth embankments have been installed around Pound Lane and Firview Close/ Gossmere Lane as part of the Marlow FAS to reduce the risk of fluvial flooding in these areas. Additionally, a compensatory flood storage area was created at Lower Pound Lane to hold excess water during flooding events. At Lower Pound Lane water levels in the ditches are managed via satellite pumps, which are turned on when trigger levels are reached. The excess water is pumped back into the River Thames. There have been no incidents of fluvial flooding in the town since the Marlow FAS was installed.

Along the south bank of the River Thames (at Bisham Road) the entire basin is noted to have flooded in the 2014 event with all houses in the area flooded. However, it is noted in this area that groundwater also likely contributes to the flooding with one resident noting that there is a distinctive smell which comes from the ground as gases are released as they are displaced by a high-water table.

Another form of fluvial flooding arises from Newt Ditch, which is used to receive stormwater. This ordinary watercourse has restricted flow due to culverting under the A404 therefore during flood events the watercourse backs up, which in turn backs up into the drainage system in the area causing flooding in East Marlow.

3.4.4 Gardens and outbuildings

Gardens of many properties are affected by flooding from both fluvial and groundwater flooding in Marlow according to local residents and information from previous flood events. Flooding of gardens can cause the dieback of non-flood-tolerant garden plants and the inundation of garden offices and sheds. During consultation with local residents flooding of gardens were noted mainly around East Marlow (specifically Gossmore Lane area), although the source of the flooding (i.e. fluvial or groundwater) was not stated. However, given the location where flooding of gardens is noted it is likely a combination of both.

4. Flood conceptualisation, mechanisms and sequencing

As highlighted above, flooding in Marlow is complex, combining both fluvial and groundwater sources, which in turn lead to other flooding types like sewers. A simplified conceptualisation of the flooding is presented here.

4.1 Flood conceptualisation

Figure 4-1 and Figure 4-2 are conceptual site models (CSM) which summarises the mechanisms of flooding in Marlow in known hotspots. Figure 4-1 figure shows a cross section from north to south through East Marlow, while Figure 4-2 shows a cross section from northwest to southeast through Pound Lane. The transect lines are displayed on Figure 1-1.

Rainfall and infiltration

Nearly all flood events have occurred in winter, with the exception of Autumn 2006 and July 2007. This suggests that rainfall is one of the main drivers for flooding as it is generally higher in the winter months. When groundwater levels are high and the catchment is saturated, the rainfall does not infiltrate through the chalk soil and greater runoff occurs with local surface water flooding.

The high groundwater levels mean that soakaways do not work well as the rainfall and surface water runoff cannot infiltrate through the ground and soakaway are not able to drain excess water.

Groundwater can infiltrate into the surface and sewerage system leaving no space for the surface water runoff and sewerage and causing backing up and flooding onto highways and properties.

Groundwater flow interaction between the gravels and chalk

Within the aquifers, under normal conditions it is likely that groundwater from the gravels drains downwards into the underlying bedrock (chalk). However, in times when groundwater levels are high in the chalk, due to increased recharge further up the catchment, there is the potential for the flow paths to be reversed and groundwater from the chalk could infiltrate the gravels when the chalk becomes saturated. This change in vertical movement can then lead to increased groundwater levels within the gravels which can lead to groundwater emergence as the water cannot move downwards as it usually does. This can occur when the river levels are at a normal level and although this is not the main mechanism for groundwater flooding, the is evidence that this has and does happen e.g. in 2006 and July 2007.

Fluvial flooding and interaction with groundwater

Fluvial flooding occurs from the overtopping of both the River Thames around Pound Land and Gossmore Park and the backing up of Newt Ditch in East Marlow. This has now been managed through the installation of the Marlow FAS and no fluival flooding has occurred in these locations since its commissioning. The backing up of Newt Ditch can cause localised flooding in East Marlow as stormwater systems back up and can increase the risk of sewerage flooding by ingress of excess water into the sewerage system.

Along the River Thames the overtopping of the river can directly impact areas around Pound Lane and Gossmore Park which lie in the adjacent floodplain, as well as areas along the south bank. Around Pound Lane measures have been taken to reduce this by installing a flood storage area and building embankments between residential areas and the low-lying floodplain. The scheme extends to Gossmore Park where the reprofiling of the playing fields protects the houses from fluvial flooding.

It is understood that the river and underlying aquifers are hydraulically linked and that under normal conditions the River Thames is 'gaining', meaning that it receives contributions from groundwater discharges with groundwater flow towards the river. However, in addition to the fluvial flooding, when the river levels rise it is likely that flow paths are reversed and the river could recharge the aquifer hence increasing groundwater levels and driving groundwater levels up further inland where fluvial flooding does not reach. This can lead to

groundwater emerging at the surface throughout the Study Area. Information from residents on flooding show some areas further inland away from watercourses that are prone to flooding and given the lack of fluvial sources it is likely that these areas of flooding are caused by groundwater flooding.

Measures to reduce groundwater flooding have been installed in Gossmore Park and around Pound Lane through the installation of shallow boreholes which pump away excess water when trigger levels are reached. This water is discharged to the river side of the flood defences and is pumped against a high head, especially when river levels are high, thereby reducing the efficiency of groundwater being able to flow away,

The interaction between groundwater and high river levels is seen as the main (but not only) cause of groundwater flooding with the most frequent groundwater flooding events being seen when the river levels is high. The Marlow FAS has helped with the flooding from the river and the groundwater levels are managed locally by pumping but there is still a risk of groundwater and surface water flooding during high river levels as the groundwater is "held" at a high level and the surface water and groundwater can only be managed by pumping away into the river. The pumping may or may not be effective depending on the volume of water to pump.

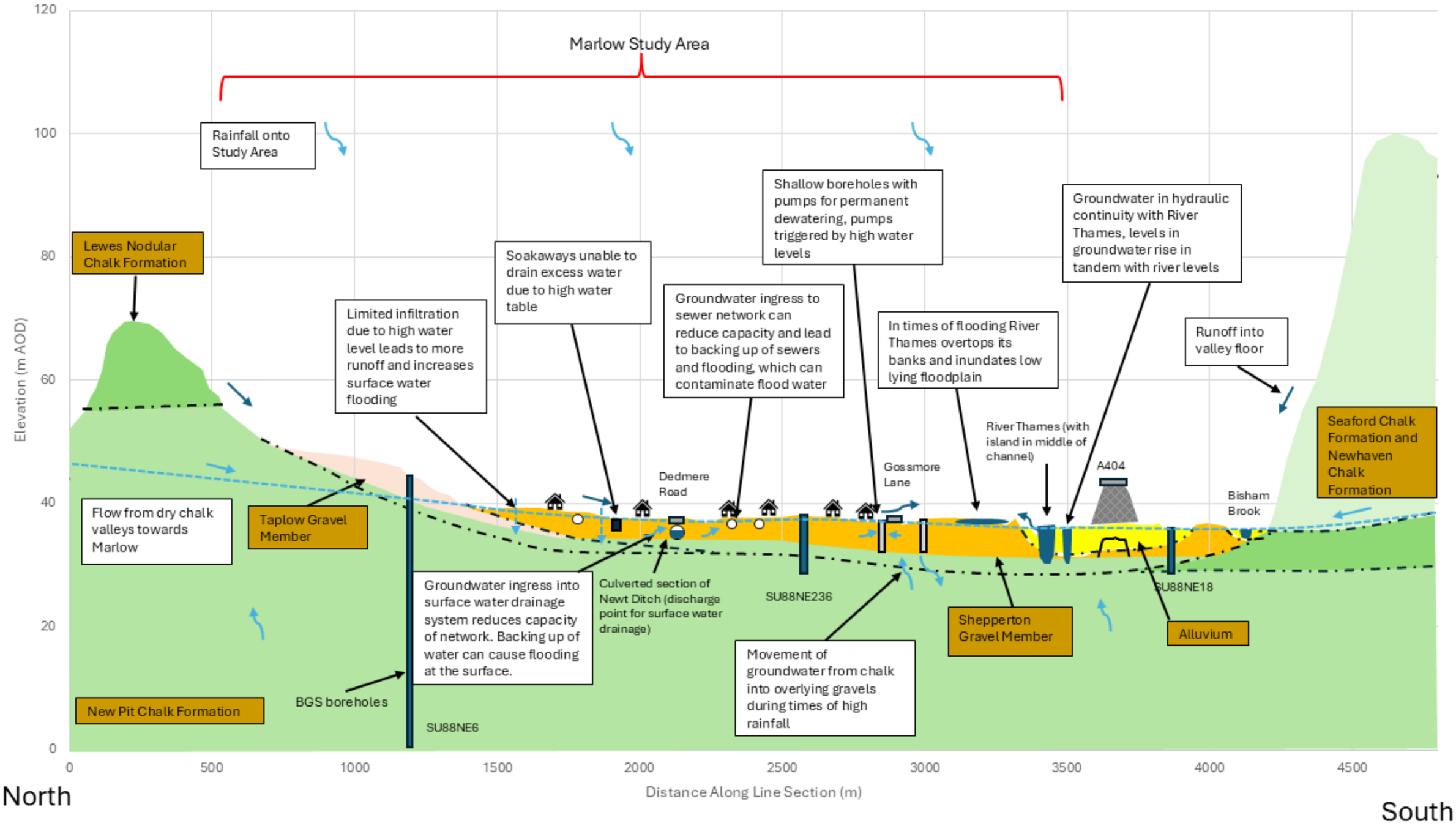


Figure 4-1. Conceptual site model showing flooding mechanisms in East Marlow

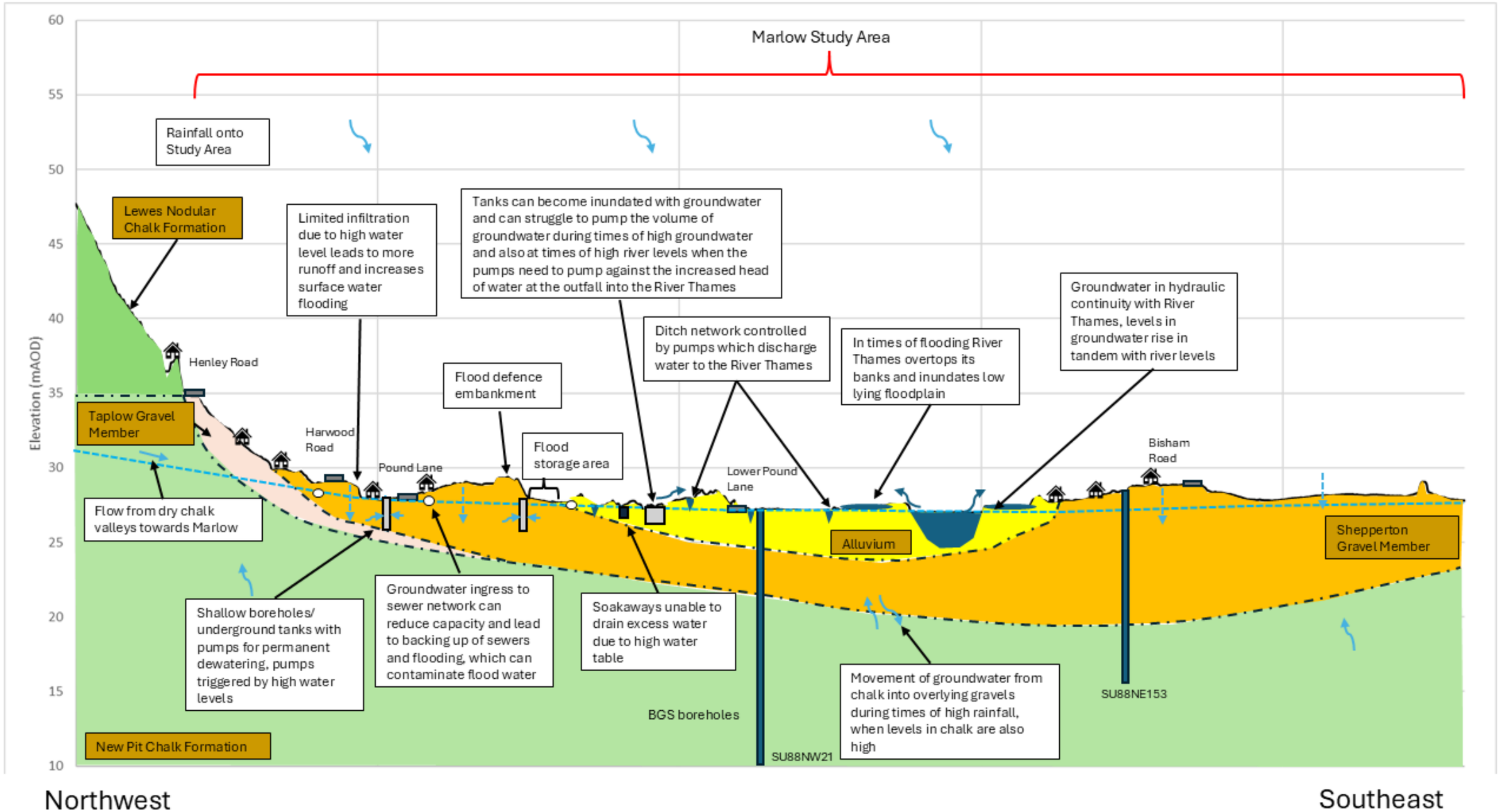


Figure 4-2. Conceptual site model showing flood mechanisms at Pound Lane

4.2 Further detail on mechanisms and sequencing

Details on the sequencing of flood events have only been identified for one flood event in 2014; therefore, it is difficult at this time to comment on the sequencing of a typical flood event in Marlow. However, from the data above it is likely that the main driver is rainfall which in turn leads to increased river level which can drive groundwater levels up further into the town causing flooding, as well as overtopping of the river into low-lying areas of the floodplain.

4.3 Knowledge gaps

Improvements could be made to the conceptualisation of the flooding in Marlow. The objectives of this would be to:

- Understand how groundwater in the gravels act during flood events as the monitoring boreholes in the area are targeting the Chalk aquifer.
- Understand the relationship between rainfall and groundwater levels in the gravels within the Marlow Catchment.
- Understand trigger levels for the pumps in Marlow and how the pumps impact groundwater levels locally by having more information on the pumping volumes.
- Understand the sequencing of events during flooding events as there is only detailed information available for one flood event in 2014.
- Reduce uncertainties in the Study Area such as: lag times between river level rises and groundwater level rises and how local groundwater levels respond during high rainfall events and flood events.

4.4 Recommendations

Recommendations to reduce gaps in knowledge include:

- A monitoring network within the area to monitor both surface water levels (in the River Thames and Newt Ditch, and ditches in Pound Lane) and groundwater levels in areas of known flooding. Specifically, to observe levels during flooding so that threshold levels for flooding events may be determined.
    - This could help to improve the understanding of the relationship between groundwater levels in the chalk and the overlying gravels as well as the relationship between surface water levels and groundwater levels in more detail. Both deep and shallow installations should be considered to establish the degree of connectivity between the gravels and the underlying chalks.
    - The monitoring network that targets the gravels would facilitate understanding how groundwater levels in the gravel deposits respond in flood events
    - Groundwater level measurements from gravel monitoring locations would allow contour mapping to be produced to determine flow directions of the groundwater in the gravels.
    - These measures could be installed in the next year to try and coincide with high groundwater and rainfall events.
    - Risks of this approach are that there may be a period of low groundwater levels and no significant flood events or data for several years.

    - The collection, collation and analysis of the data require some time, money and skill and this type of monitoring is costly

- The installation and use of a rainfall monitoring point within the Marlow area to understand trends between rainfall and groundwater levels in Marlow, rather than using rainfall stations which are at topographical highs and are less reflective of conditions in Marlow Town (a topographical low).
- Increase interactions with local resident in the area to understand more the impacts of historical floods on the local community and gain firsthand accounts of flooding events. This citizen science approach would complement the understanding but would need a Risk Management Authority to co-ordinate and manage the data collection, collation and analysis.
- Obtain data on any groundwater licensed and unlicensed abstractions in the area (likely mainly from the chalk) to understand if these play any part in reducing groundwater levels/ risk of groundwater flooding within Marlow in the chalk.
- Improve understanding of sewerage and drainage sub-surface network and their interactions with shallow groundwater. For example, are groundwater levels at similar levels to the network and if so, does the network act as a conduit for flow during normal conditions as well as during flood events.
- Explore some of the areas away from the surface water network where flooding has been recorded to determine if these are purely groundwater driven flooding.
- LiDAR data available is 1m resolution, higher resolution LiDAR data could allow flow pathways to be identified within Marlow.
- Improve understanding of trigger levels for groundwater pumps in East Marlow along with trigger levels for the ditches in Pound Lane.
- Improve understanding of impacts of flooding, especially on basement flooding which is not well understood in the Marlow Area.

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