

## Battlemead Common: Groundwater Monitoring in the Willow Fields and flow in the White Brook



*Boreholes drilled in the area of Battlemead Common*

### Background

An online map produced by the British Geological Survey shows the location of boreholes in Battlemead Common, Widbrook Common, and the east bank of the Thames.<sup>1</sup> It is possible the shallow boreholes (drilled to 10m) on the two commons were linked to investigations for the North Maidenhead Flood Bund.

In the willow fields, two wells (SU98SW110 & SU98SW111) were drilled in 1997 to 60m on behalf of Thames Water Utilities, presumably to assess potential for water extraction. The first well (SU98SW110) was wider than the second and after test-pumping data was obtained, an observation tube of 2.55m was apparently inserted in the well and the remainder of the well backfilled to create the currently accessible borehole. There is now no trace of the other well which may be under the flood bund.

As gravel was found from 1.4 to 4m, the observation tube will be reflecting the water level in that material (see borehole record below).



*Observation borehole in the Willow Fields with overflowing backwater – December 2020*

<sup>1</sup> <https://mapapps.bgs.ac.uk/geologyofbritain/home.html>, then click on “Borehole Scans” tab and navigate to this area.

SU98/S111

**G. STOW PLC**

BOREHOLE RECORD  
255

stow	TW130
NRA No.	Geological Survey

EASTERN L.S.  
THAMES E.A.

SU98/SW

<b>A. SITE DETAILS</b>	
Borehole drilled for.....	Thames Water Utilities
Location.....	Taplow
NGR (8 fig.).....	SU 9055 8355      B/H Type: ABH
Ground level (if known)..	
Drilling Company.....	G. STOW PLC
Date of drilling.....	Commenced: 17.4.97      Completed: 8.5.97
<b>B. CONSTRUCTION DETAILS</b>	
Borehole datum (if not ground level)	G.L.
Borehole drilled diameter.....	876mm from GL to 9m/depth 724mm from 9 to 60m/depth
Casing material:	Mild Steel      dia:      762mm from 0.5 AGL to 9m/depth
Grouting details:	
Water struck at:      3.08	
Rest water level on completion.....	2.72m (below datum - mbd)
<b>C. TEST PUMPING SUMMARY</b>	
Test pumping datum..... (if different from borehole datum)	600mm      above B/H datum
Pump suction depth.....	41mbd
Water level (start of test).....	3.21mbd      date:      27.5.97
Water level (end of test).....	8.98 mbd      date:      6.6.97
Pumping rate.....	160 L/S Approx.
Recovery to.....	3.24m after 3 hrs
Remarks:	
Final RWL = 2.10m (Borehole developed further during 10 day CRT).	

*Above and below: borehole record for borehole SU98SW110 (OS grid ref: SU9055 8355)*

British Geological Survey		stow	TW130
		NRA No.	
D. STRATA LOG			
Geological Classification	Description of Strata	Thickness m	Depth m
Top Soil	Earth and Stones	.3	.3
~	Brown Clay	1.1	1.4
~	Blue/Grey Gravels	2.6	4
Upper Chalk	Putty Chalk	2	6
	Chalk & Flints	24	30
	Putty Chalk	10	40
	Firm Chalk	20	60

To help understand the hydrology of the willow fields which has, in the winter, extensive backwaters, it was decided to monitor the borehole on a monthly basis, to establish groundwater depth (GW). An initial test was undertaken in November 2019 and then, beginning in January 2020, data were collected monthly. Initially an electronic dip sensor was used and then subsequently one was improvised because of equipment issues.

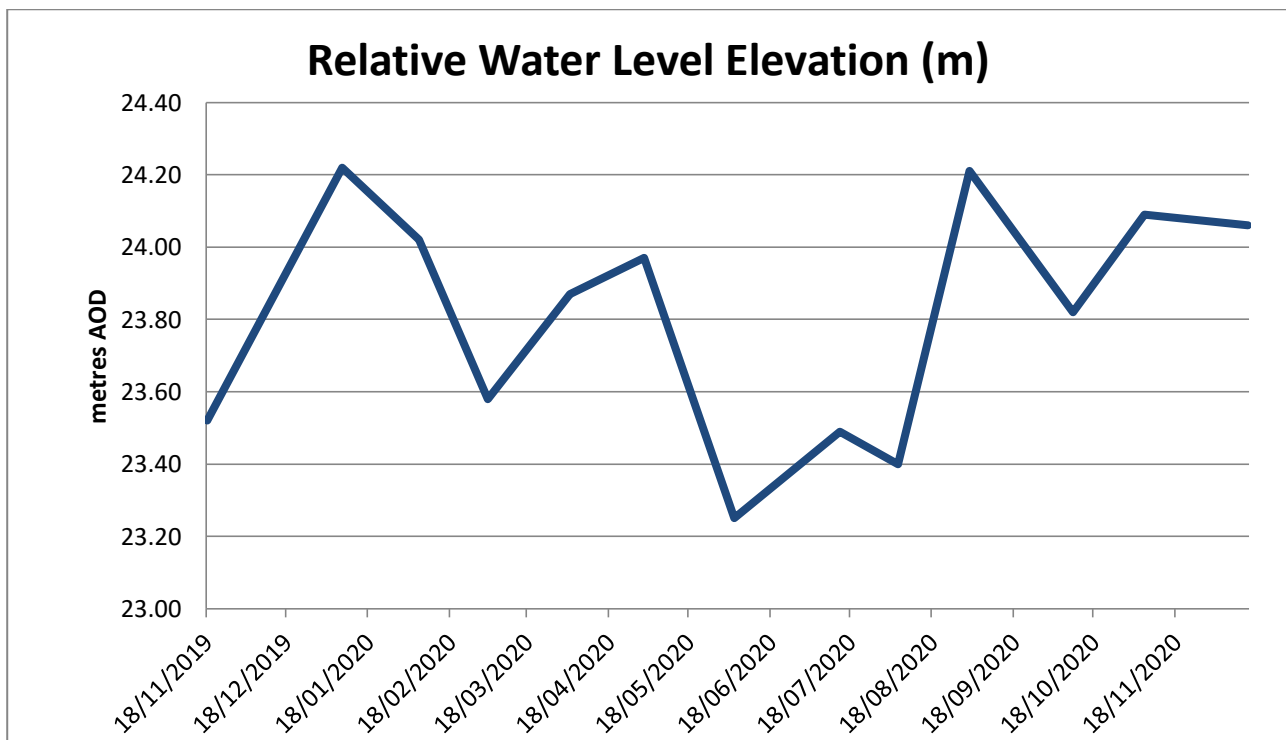


*Borehole SU98SW110 and close-up showing the observation tube within the outer casing.*

*nb: Outer casing protrudes 300mm above ground level. Gravel within outer casing is 1.4m below ground level. Bottom of observation tube is 2.55m below top of the tube. Ground elevation at the site estimated to be 25m AOD (from 1:25,000 OS map). All measurements of depth to GW are relative to top edge of outer protective casing. Outer casing is approximately 27.5 mm higher than inner observation tube.*

## Results

DATE	GROUND WATER LEVEL (Depth below outer casing top in m)	GWL AOD	CHANGE RELATIVE TO PREVIOUS MONTH (In mm. +ve = a rise; -ve = a drop)
18/11/2019	1.78	23.52	
08/01/2020	1.08	24.22	700
06/02/2020	1.28	24.02	-200
03/03/2020	1.72	23.58	-440
03/04/2020	1.43	23.87	290
01/05/2020	1.33	23.97	100
04/06/2020	2.05	23.25	-720
14/07/2020	1.81	23.49	240
05/08/2020	1.90	23.40	-90
01/09/2020	1.09	24.21	810
10/10/2020	1.48	23.82	-390
06/11/2020	1.21	24.09	270
15/12/2020	1.24	24.06	-30



## Conclusions

As might be expected the ground water level rises in the winter and drops in the summer and is broadly related to the presence or absence of surface water in the backwaters. In 2020 the minimum GW depth recorded was 78cm (January) and the maximum 165cm (June).



However, the exception is during flood conditions. A near flood event in February, when the flow in the White Brook changed direction, flowing into the Thames at Islet Park rather than out of it, resulted in a drop both of surface water in the willow fields as well as ground water.<sup>2</sup> This has been linked to a drop in the level of the Thames at that time, the level being controlled by the weir at Boulter's Lock. Certainly, in the past, when the stream failed to reach Maidenhead town centre, the weir was used to raise the river level to increase flow into the White Brook. The corollary, lowering the river level, decreases flow into the Brook.

Ensuring flow into the White Brook will be especially important in the warmer months so that the waterway in Maidenhead town centre does not dry. This will be more of an ecological disaster than in the past when the stream dried and distressed residents rescued fish from the remaining pools. Now the new waterway supports several types of wildfowl including a heron, a pair of swans, many mallards & moor hens, plus fish and other aquatic fauna.<sup>3</sup>

There has been no significant desilting of the White Brook, on what is now Battlemead Common, since 2011 (see photo below), and both silt and reeds have accumulated in the brook over the intervening years. In the past silt was spread on the bank, helping to restore damage due to poaching by cattle; in the distant past it was even seeded. The absence of such restoration has led to the creation of the wetlands on the East Field of Battlemead Common.



*The White Brook after the last desilting, February 2011- the east bank of the brook, seen in the distance, is now wetland. This bank was poached by cattle in the past*

---

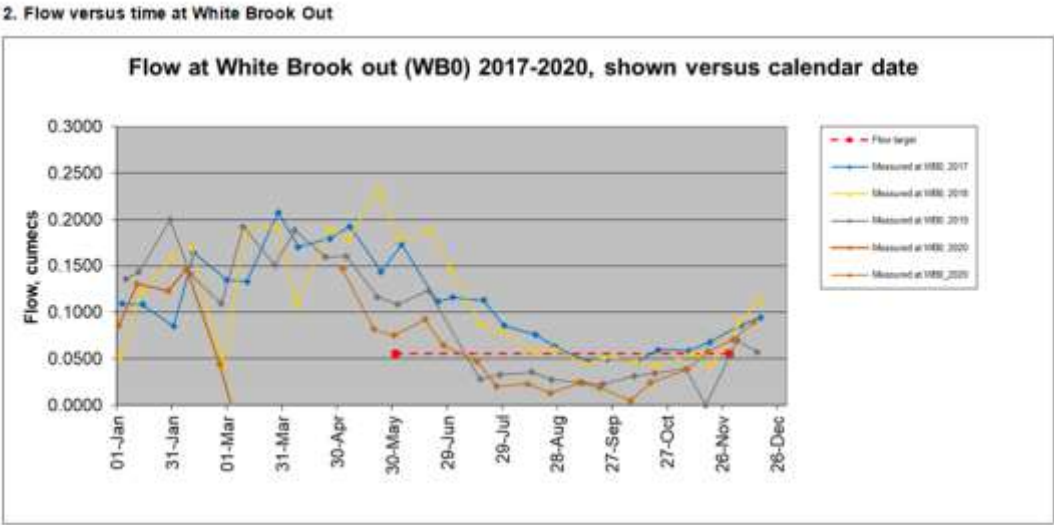
<sup>2</sup> Darracott A 2020: *The effect of near-flood conditions on the White Brook on Battlemead Common and its impact on groundwater and surface water in the wetland and its aftermath*, Maidenhead Civic Society.

<sup>3</sup> Darracott A 2020: *Survey of biota in locations along York Stream before and after discharge of blue dye into the newly created Chapel Arches basin*, Maidenhead Civic Society.



Silt spread on the east bank of the White Brook during desilting in August 2004 in the East Field

Data indicates that flow in the White Brook has slowed in 2019 and in 2020, compared to earlier years, and in the warmer months has dropped below target flow (see graph).<sup>4</sup> Due to covid restrictions attempts by volunteers from Maidenhead Waterways to maintain flow by the regular manual removal of reeds and aquatic vegetation such as Fools Watercress, from different sections of the brook, was more limited in 2020. On Battlemead in March 2020 two fallen trees were removed from the brook and also a trial desilting of 30m took place. These actions did not improve 2020 flow compared to 2019, in fact the data indicates there was even less flow.



*Flow in the White Brook in 2020 compared to previous years: monitoring point just east of the junction with Strandwater (courtesy of Maidenhead Waterways)*

Flow to Maidenhead must be maintained throughout the year. Soon the new basin in the *Waterside Quarter*, currently under construction, will be filled. The new waterway, with its two basins, requires adequate flow reaching Maidenhead from the northern stream system.

The South East Water workshop held in 2018 proposed a programme of desilting, a method used in the past to maintain flow in this stream system. Desilting, together with control of the weir at Boulter's Lock, will hopefully ensure that flow in the White Brook is improved.

Ann Darracott,  
Maidenhead Civic Society, December 2020

<sup>4</sup> According to Maidenhead Waterways flow from Strand Water has increased over the same time period, helped by the March 2020 desilting of the ditch that connects the Marsh Meadow Ditch to the Thames. This ditch to the Thames was dug by the National Rivers Authority (now the EA) in 1994 to get more water into the stream system, as the stream in Maidenhead town centre was still drying in the summer (see Darracott A 2006 *York Stream a review of past efforts to keep the stream clear* Maidenhead Civic Society p12)