Appendix D. Water Situation Reporting

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D1. Water Situation Reports Produced by Thames Water

We produce monthly Water Situation Report (WSR) which use data provided by the Environment Agency to produce a selection of hydrographs and tables. The frequency of reporting is increased during a drought to bi-weekly or weekly depending on the severity of the drought situation. We collate and analyse the hydrological data sent by the Environment Agency (see Appendix J for more detail) and combines this with water supply information it gathers to produce an up-to-date assessment of the water resources situation across our water supply area. The WSR includes the following information:

D1.1 Rainfall Data

Figures D1, D2 and D3 provide examples of how the rainfall data is presented.

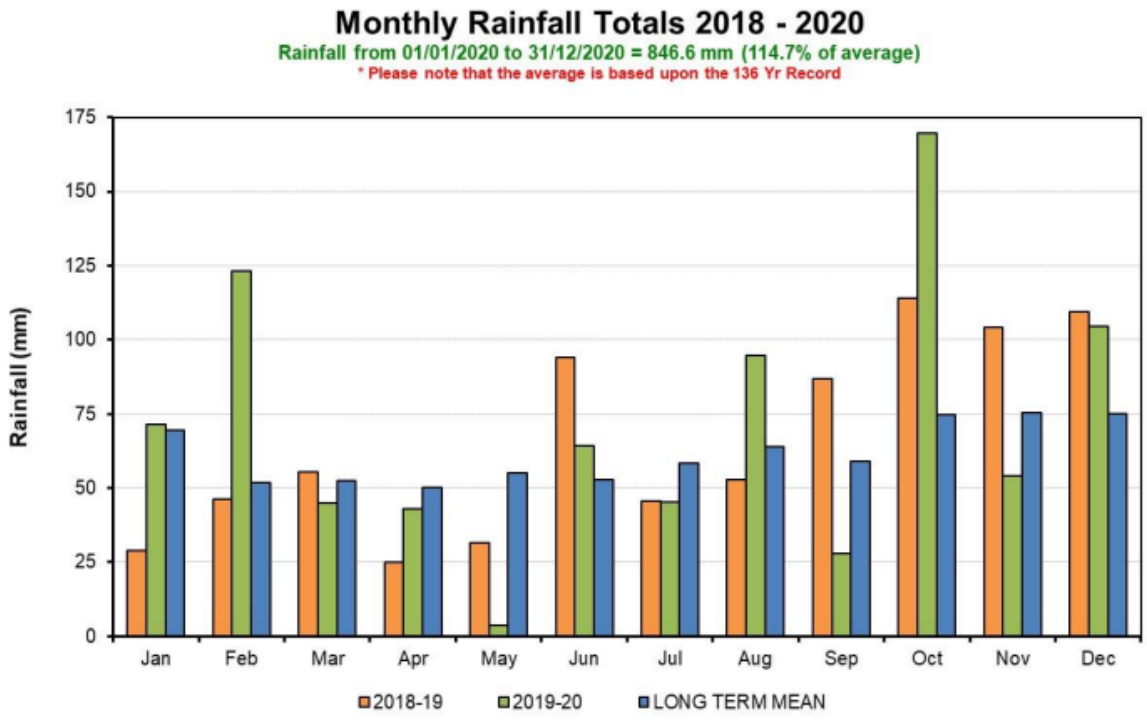

Figure 1: D1 Monthly Rainfall 2018 - 2020
NB the average is based on 126 year record

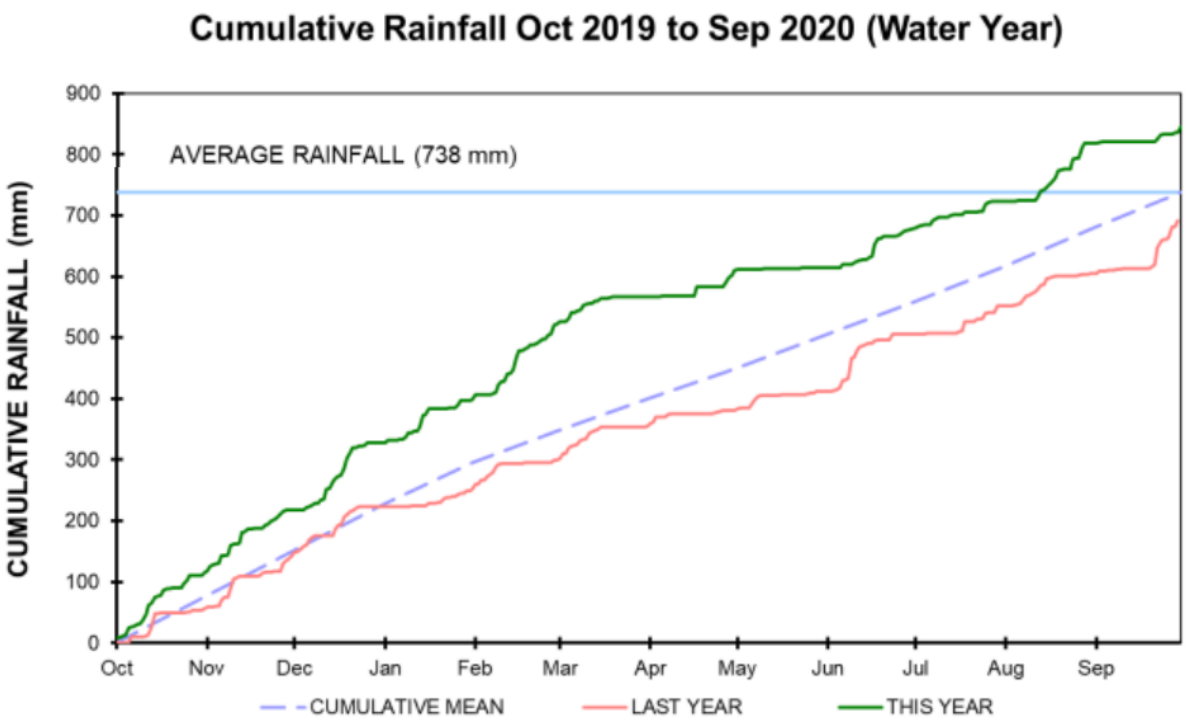

Figure 2: D2 Thames Region (12 Station) Cumulative Rainfall

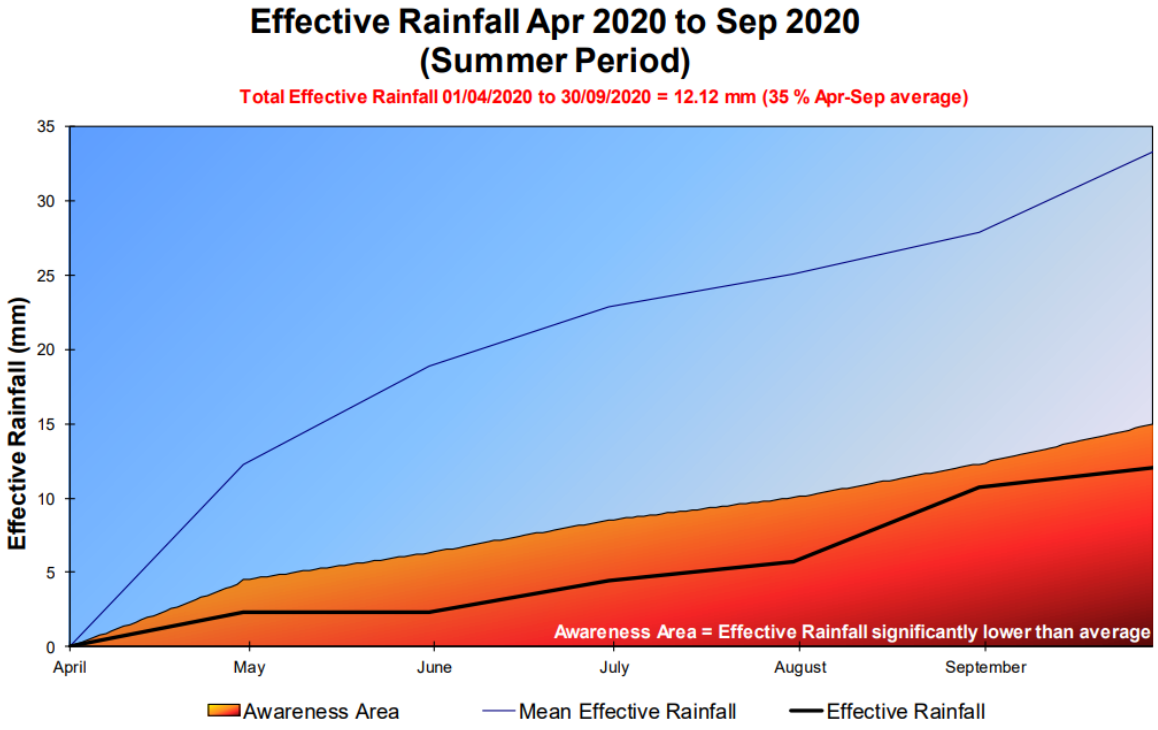

Figure 3: D3 Thames Region Effective Rainfall (percolation)

D1.2 Soil Moisture Deficit (SMD)

Rainfall effectiveness is governed by the SMD level, consequently an ongoing appreciation of SMD is important, particularly at the start of the winter recharge period (September though November) when the high SMD levels that developed over the summer are steadily reduced. Figure D4 illustrates the annual cycle of SMD level from January 2010 to August 2016. Figure D5 shows an example of site-specific SMD measurements across the Thames catchment for August 2016.

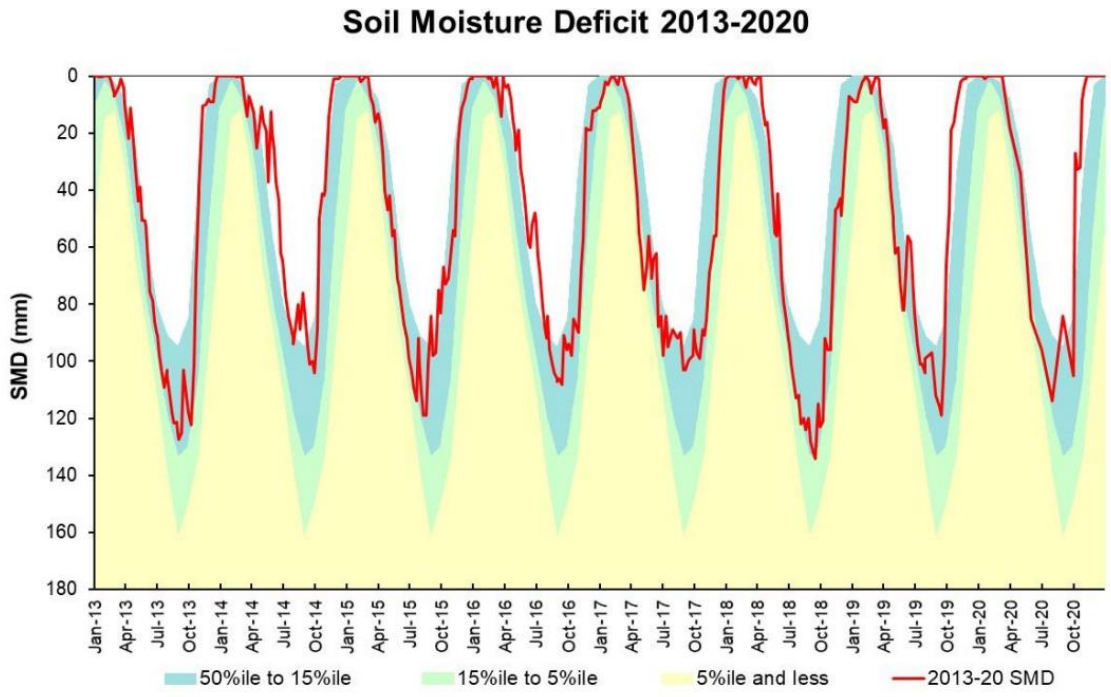

Figure 4: D4 Thames Region Soil Moisture Deficits (SMDs) for 2010 to 2016

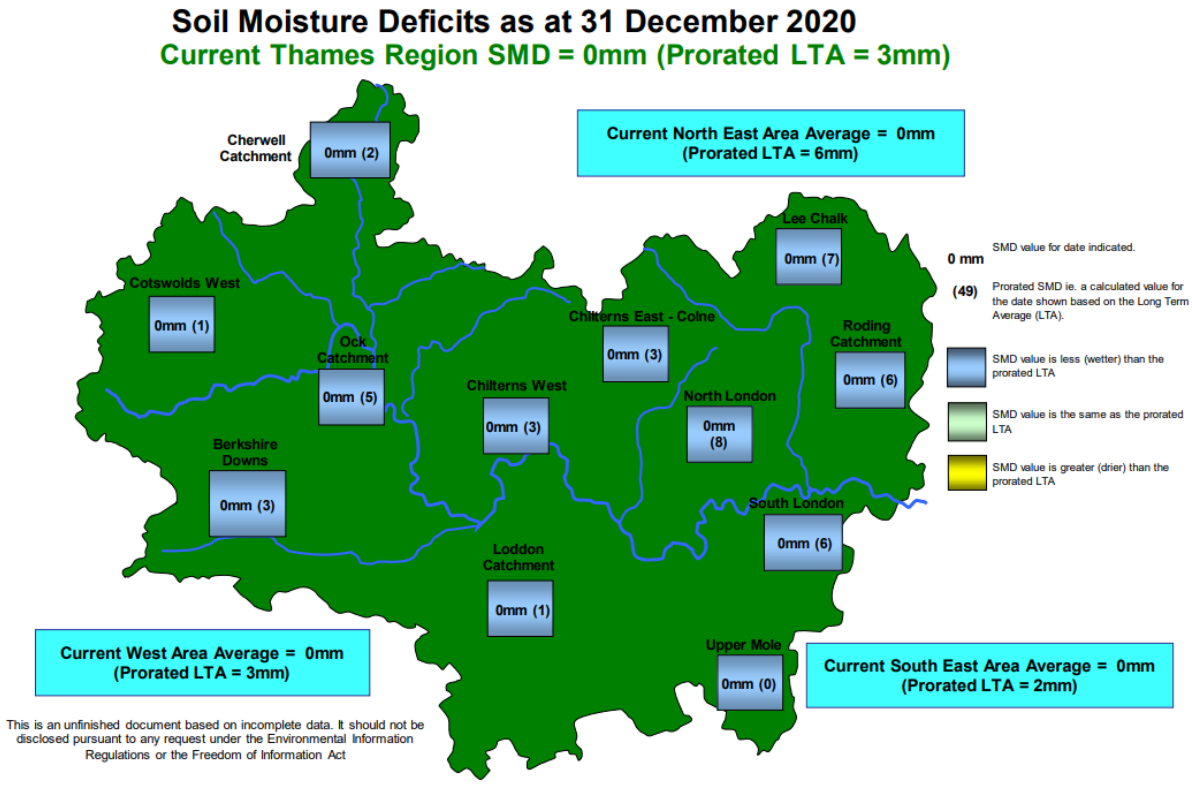

Figure 5: Soil Moisture Deficits as at 31 December 2020

D1.3 River Flows Selection of Data and Listing of Available Data

The Environment Agency provide river flow data at a series of gauging stations, the most important of which are associated with constraints on river or groundwater abstraction licences. Table D2 gives the list of key gauging sites. Examples of river hydrographs are given in Figures D6 to D9.

Table 1 D2 River Gauging Sites

River	Gauging Site
Lower Thames	Teddington Weir
Middle Thames	Reading
Upper Thames	Farmoor
Lee	Fieldes Weir
Cray	Crayford
Darent	Hawley
Law Brook	Albury
Tillingbourne	Shalford
Wey	Tilford
Kennet	Knighton
Kennet	Theale
Pang	Pangbourne
Churn	Cirencester
Coln	Bibury
Cherwell	Banbury

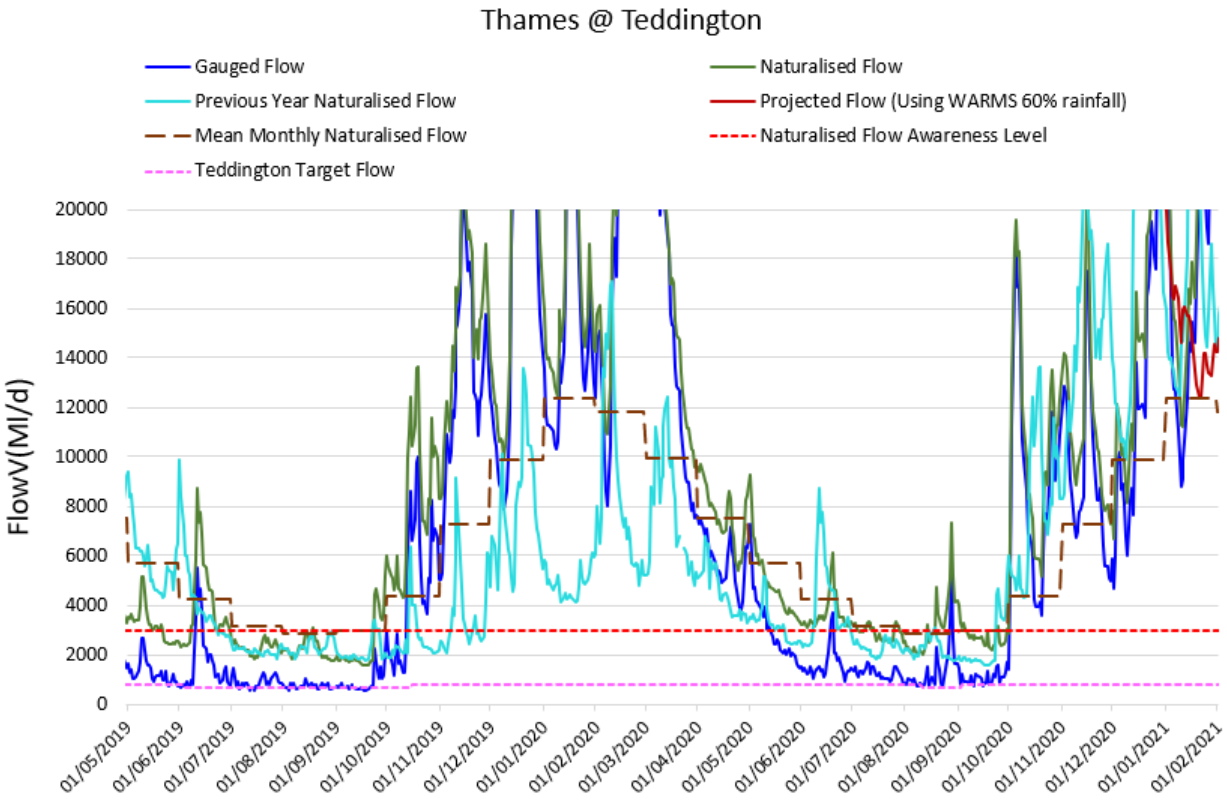

Figure 6 D 6 Flows over Teddington Weir, Gauged and Naturalised Flow

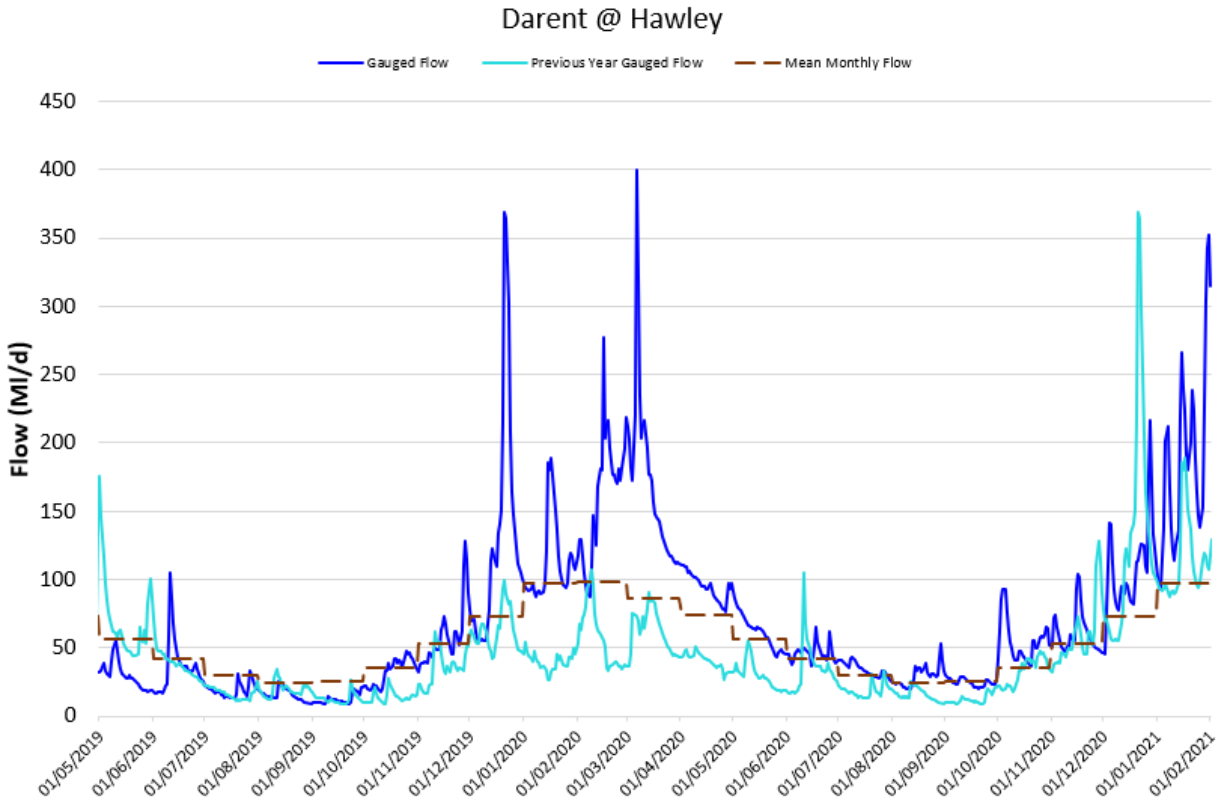

Figure 7 D7 Flows in the Darent at Hawley, Gauged Flow

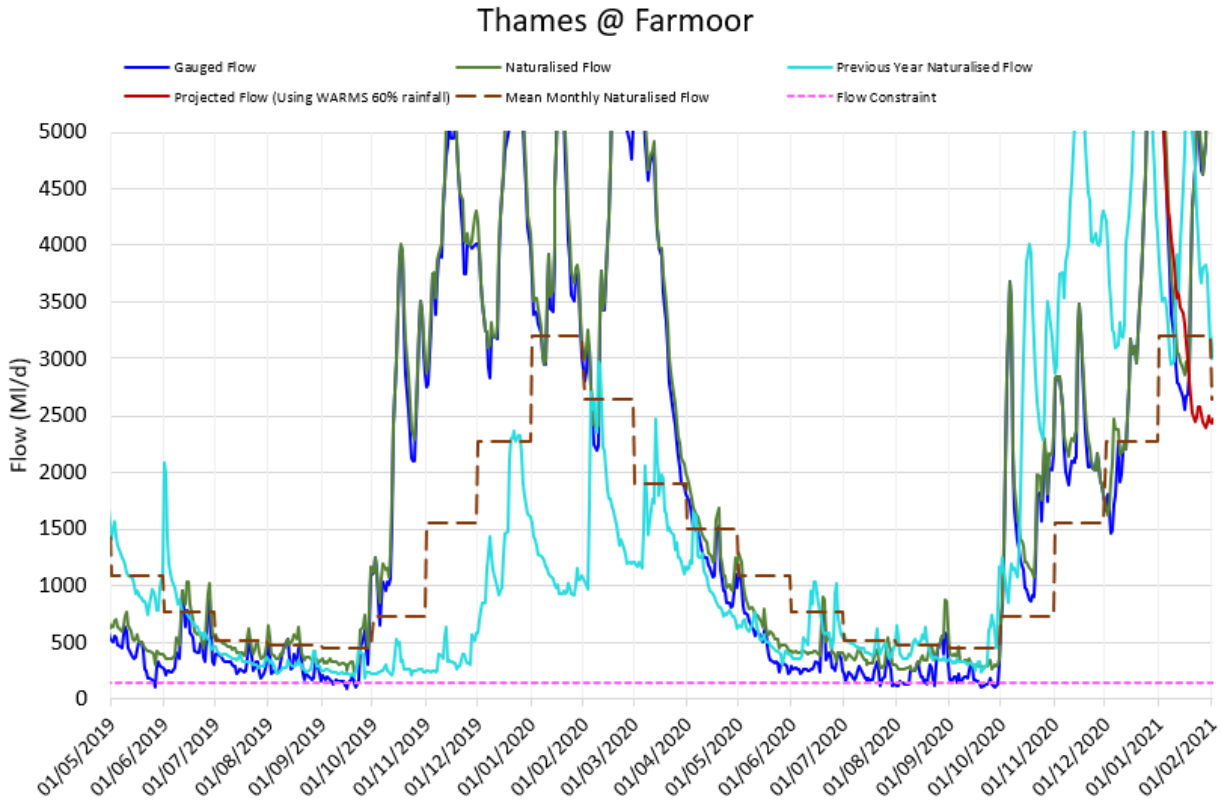

Figure 8 D8 Gauged and Natralised Flows in the River Thames at Farmoor

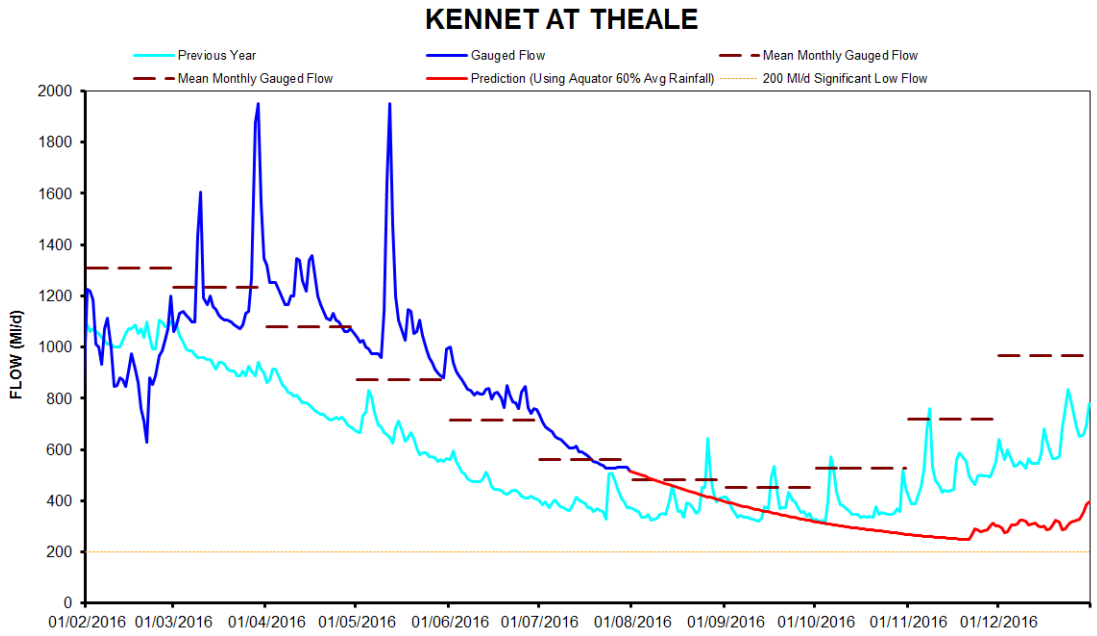

Figure 9 D9 Gauged and predicted flows in the River Kennet at Theale

The Environment Agency provides regular updates of river flows and risk of reaching abstraction licence flow constraints. Table D3 provides an example of the output for August 2016.

Table 2 D3 Abstraction licence flow constraints and risk level for January 2021

Flow Constraints:

River	Abstraction Location	Constraint Value Ml/d	Licence Condition	Date	Current Value (EA) Ml/d		Risk*		
							High	Med.	Low
Cherwell @ Banbury	Banbury (Low Flow Scheme)	10.0	6 Hr	31-Dec-20	248.0				✓
Churn @ Cirencester	Baunton	32.0	5 Day Mean	28/12-31/12/2020	305.9				✓
Coln @ Bibury	Meysey Hampton	68.0	5 Day Mean	28/12-31/12/2020	456.2				✓
Cray @ Crayford	Bexley	24.0	5 Day Cons Below	31-Dec-20	90.0				✓
Kennet @ Knighton	Axford	100.0	5 Days Cons Below	31-Dec-20	223.5				✓
Law Brook @ Albury	Albury BHs	2.27	1 Day	31-Dec-20	9.7				✓
Pang @ Pangbourne	Pangbourne	18.0	5 Day Cons Below	31-Dec-20	116.6				✓
Sor Brook @ Bodicote	Bodicote - NOT USED	14.0	1 Day	31-Dec-20	67.8				✓
Thames @ Farmoor (Natural)	Farmoor	136.4	1 Day	31-Dec-20	6048.0				✓
Thames @ Reading	Gatehampton	400.0	5 Day Cons Below	31-Dec-20	3801.6				✓

*Risk indicates the chance of the river flow falling below the licence flow constraint at the gauging station

D1.4 Groundwater Levels – Thames Valley and London

The Environment Agency monitors a national network of regional observation boreholes (OBHs). Table D4 shows the OBHs relevant to the Thames catchment for which groundwater level data is provided on a regular basis. Examples of well hydrographs are given in Figures D10 and D11.

Table 3 D4 Regional observation boreholes (OBHs) and associated aquifer unit

Regional OBH	Aquifer
Jackaments Bottom	Cotswolds Inferior Oolite Limestone
Rockley	Marlborough Downs Chalk
Gibbet Cottages	Berkshire Downs Chalk
Stonor Manor	Chilterns Chalk
Ashley Green	Chilterns Chalk
Lilley Bottom	East Chilterns Chalk
Therfield Rectory	Lee Valley Chalk
Tile Barn Farm	North Downs Chalk
Well House Inn (replaced By Chipsted)	North Downs Chalk
Rose and Crown	Croydon Chalk
Riverhead	Darent Lower Greensand

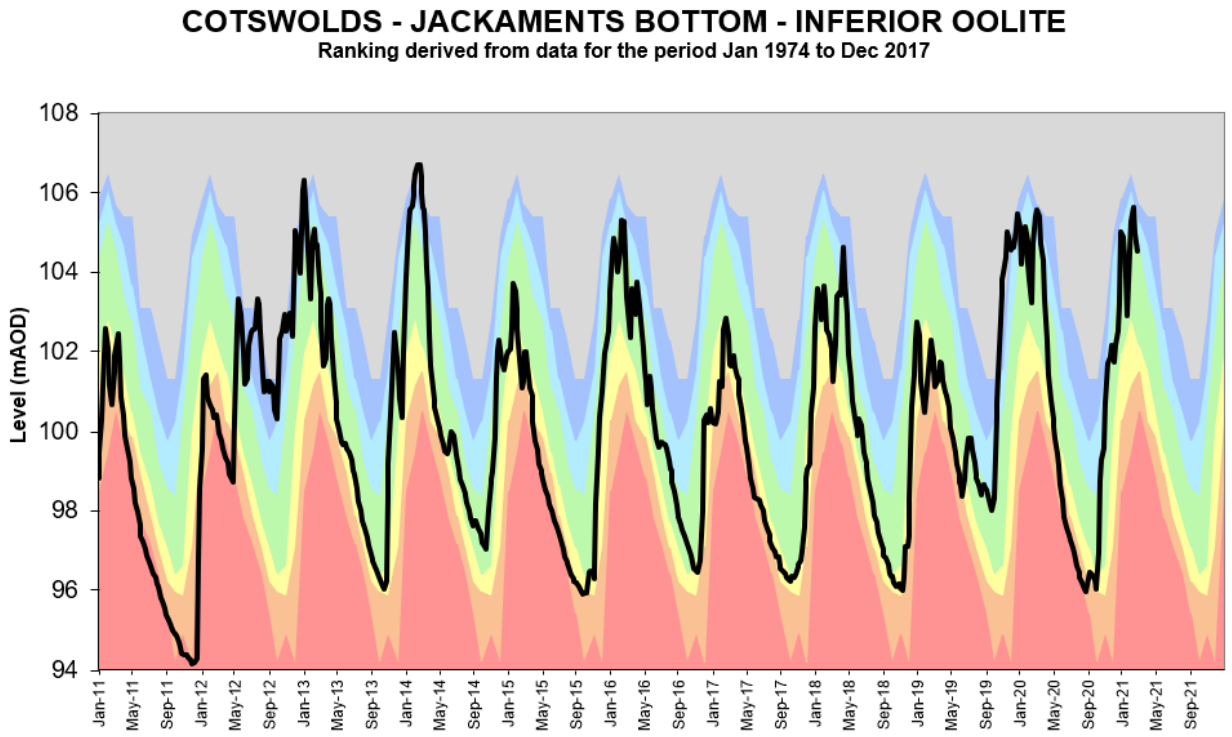

Figure 10 D10 Ground water levels in Jackaments Bottom

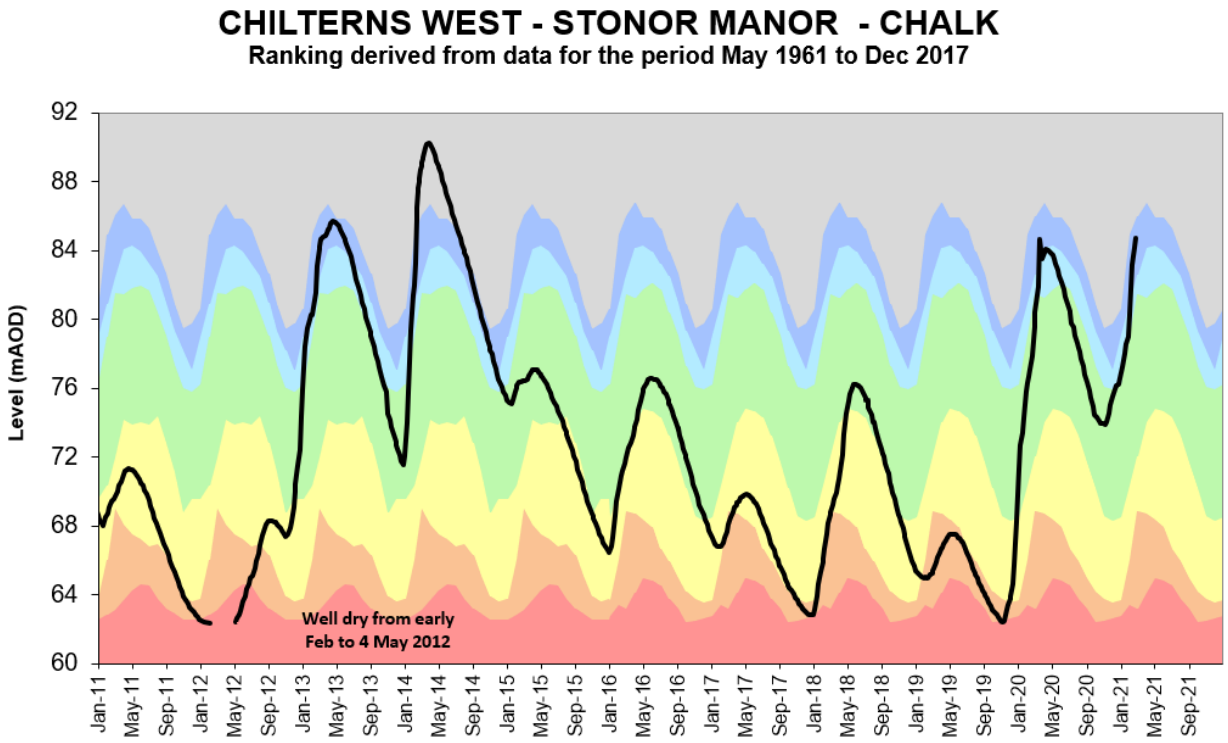

Figure 11 D11 Ground water levels in Stonor Park

D1.5 Reservoir Storage

We measure our reservoir storage on a daily basis. The table below shows the actual levels for 2 August 2016.

Table 4 D5 Reservoir Storage Values - 31 January 2021

Reservoir Storage on 31 January 2021:

	TOTAL IN STORAGE (Ml)	USABLE CAPACITY (Ml)	% FULL January 31, 2021	CHANGE FROM December 31, 2020	% FULL January 31, 2020
WEST LONDON	143645	165090	87%	1%	91%
LEE VALLEY	30288	37739	80%	3%	93%
TOTAL LONDON	**173933**	**202828**	**86%**	**2%**	**91%**
FARMOOR	12244	13822	89%	10%	97%

D1.6 Works Outputs (Water in to Supply) for whole Company, London and Thames Valley

The Distribution Input (i.e. the water into supply) is monitored daily and reported each week for the Company as a whole and for London and Thames Valley separately. This is compared to the previous year and the average over the last 5 years. This information is used to track how demand changes through the course of a drought event