



Abstraction Incentive Mechanism – Methodology and Abstraction in 2020- 2021

Affinity Water

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Executive Summary

The Abstraction Incentive Mechanism (AIM) has been proposed by Ofwat with the objective of encouraging water companies to reduce the environmental impact of abstracting water at environmentally sensitive sites during low flow periods (i.e. droughts). The purpose of this document is to set out the methodology and assumptions used to calculate the AIM triggers and baseline abstraction values. Actual abstraction data from the AIM sources for the financial year 2020-21 are shown in this report, in order to track performance and validate the AIM triggers selected.

A total of 23 groundwater sources were identified as sensitive by Affinity Water in 2016 when AIM came into force. Some sources had sustainability reductions implemented in AMP6 or will have sustainability reductions implemented in late AMP7. A number of sources that are part of the AIM list, have an operating agreement in place, other licence condition or have previously been under National Environment Programme (NEP) investigation. The AIM taskforce guidelines as proposed by Ofwat were followed to calculate the triggers and abstraction baseline figures. The AIM triggers selected were based on the Environment Agency's Restoring Sustainable Abstraction (RSA) assessments, NEP investigations or other Environmental Impact Assessment (EIA) work. Q95 flows were generally adopted as best indication of low flow conditions for the AIM triggers. Alternatively for five of the sources, the triggers adopted were either specified as a licence condition or based on an operating agreement. Baseline abstraction values were calculated based on the 20-year period of 1st April 1995 - 31st March 2015 as this period is considered representative enough to include a number of droughts with and without demand restrictions. Where sustainability reductions have already taken place which have not reduced the deployable output to zero MI/d, we have kept these sources in AIM, with the new AIM baseline being defined as the new annual average equivalent licensed rate.

Following the Ofwat guidance, two equations were used to calculate the AIM performance and the normalised AIM performance. For the three AIM sources across two catchments at which the trigger was breached during 2020-21, the global AIM performance was -304.31 MI and the normalised global AIM performance was -0.42. The negative AIM performance figure signifies an improved performance compared to historic droughts, as average abstraction was lower than the baseline at the global scale when AIM was active. This suggests that the company met and exceeded the AIM baseline figures for the financial year 2020-21 which is mainly linked to the proactive management of available sources.

Following the annual review of the AIM triggers and baseline abstractions, it appears that they are robust and representative of the catchment status. The validity of the triggers and baseline abstraction is constantly monitored. Since the start of AMP7 in April 2020, the global AIM score is calculated and tracked on a monthly basis and an end of month forecast is produced.

1 Purpose

The Abstraction Incentive Mechanism (AIM) has the objective of encouraging water companies to reduce the environmental impact of abstracting water at environmentally sensitive sites in low flow periods (i.e. droughts). The purpose of this document is to set out the methodology and assumptions used to calculate the AIM triggers and baseline abstraction values. Furthermore, actual abstraction data from the AIM sources for the financial year 2020-21 are shown in this report, in order to track performance and validate the AIM triggers selected. In 2016 when AIM came into force in reputational form, we put forward a total of 23 groundwater sources to be included in AIM, which have been deemed as potentially environmentally sensitive by previous studies. Seven sources have been subject to sustainability reductions since 2016, with the deployable output (DO) at three of these sites being reduced to zero MI/d. These three sources have been omitted from the AIM assessment, in addition to the CHAL source, which has been deemed to be 'not environmentally sensitive', following discussion with the Environment Agency. This leaves a total of 19 sources that have been assessed for AIM in this report and will be reported on for the remainder of AMP7.

2 Methodology

A total of 19 sites have been assessed as potentially having an impact on a surface waterbody hence included in the AIM list. Seven sources have been subject to sustainability reductions as of 1 April 2018 (three of them resulted in full cessation, so zero Deployable Output (DO)) and so the post-reduction abstraction rates for the remainder four sources are considered for this assessment period. Sustainability reductions are planned for six additional sources in late AMP7 and a second sustainability reduction is planned at AMER. The remaining ten sources have either an operating agreement in place (i.e. augmentation scheme) or other licence condition or have previously been under National Environment Programme (NEP) investigation.

In order to calculate the trigger and abstraction baseline, the AIM Taskforce guidelines have been followed. Based on these, the AIM trigger is set based on a specific environmental trigger identified through the Environment Agency's (EA) RSA assessments, NEP investigations or other EIA work. Q95 flows have been adopted as the best indicator of low flow conditions below which AIM should operate. Alternatively for five of the sources, the triggers adopted were either specified as a licence condition or based on an operating agreement. In the majority of cases, the potentially impacted surface water body is the river, so the trigger is set in the downstream gauging station that is considered to be representative of the groundwater catchment. There are exceptions to this, where a groundwater level trigger has been used instead, due to better representation of the aquifer baseline conditions or the absence of a gauging station.

The length of the record for each gauging station or groundwater level monitoring point is defined by the data availability and data quality in order to better calculate the AIM trigger. Where the Q95 or Q70 values have been used, these were adopted from the Centre of Ecology and Hydrology as published on their website¹ in July 2016.

Once the AIM triggers were identified, the baseline abstraction values were calculated based on the average abstraction during the historic period when river flows or groundwater levels were at

or below the trigger. The duration of the abstraction record was chosen as the period between the 1st April 1995 and the 31st March 2015. This 20-year period was chosen as the most representative of current and future abstraction patterns, as the distribution network constantly evolves and reliance on particular sources may change accordingly. Also, if this were to extend further back, the uncertainty on data quality would increase as flow meters were not always available, with abstraction being calculated based on pump hours. Following the AIM guidance stating that “the past needs to be representative of the future”, the period from 1995 – 2015 is thought to best represent the future. Furthermore, this 20-year period includes a number of low flow periods (1997, 2003, 2005, 2006 and 2012) with some of them having demand restrictions and others being unrestricted. As such, this record is considered as being long enough to incorporate different types of droughts and also smooth out abstraction values that may be very low due to site outages. In cases where outliers were found that are deemed as not representative of the future use of the sources, these were highlighted and addressed appropriately as explained in the next sections.

3 Triggers and Abstraction Baseline

Table 1 below presents the sources that were submitted to Ofwat in September 2015 for inclusion in the AIM list.

Table 1. Sources Operated Under AIM from 1 April 2016

	Source	Group	Licence Number	Avg. Ann. Licence	Max Daily Licence	2015 DO		AMP6 SR	AMP7 SR
NEP further sites	NETH	CLAY	28/39/28/336		40.91	28.00	30.00	No	No
	BRIC	CLAY	28/39/28/336		27.28	14.00	15.00	No	No
AMP5 sustainability operating agreements	OUGH	Individual	06/31/13/11	4.55	6.55	4.10	5.22	No	No
	SLIP	Individual	06/33/14/36	5.46	6.82	0.00	0.00	No	No
	WELL	Individual	06/33/13/10	2.27	2.27	1.15	1.15	No	No
	OFFS	Individual	06/33/13/09	1.14	1.14	0.00	0.00	No	No
	PRIM	Individual	9/40/4/497/G	3.00	4.00	3.00	3.00	No	No
	BUCM	Individual	14/033	4.00	4.00	4.00	4.00	No	No
	DENG Gravels	DENG	9/40/5/71/G	9.04	15.00	4.65	9.04	No	No
AMP6 Sustainability reduction sites	BOWB*	KENS	28/39/28/130	6.82	11.37	5.82	5.82	Yes	N/A
	AMER	GREM	28/39/28/334	7	18.18	7.00	12.00	Yes	Yes
	WHIH	WHIH	29/38/03/42	22.73	30.46	15.00	28.00	Yes	No
	FULL*	DIGS	29/38/02/46	9.09	9.09	5.60	9.09	Yes	No
	MARL	LITT	28/39/28/335		20.47	4.74	4.74	Yes	No
	PICC	LITT	28/39/28/335			15.72	15.72	Yes	No
	HUGH*	Individual	28/39/25/47	2.28	2.27	1.60	1.75	Yes	N/A
AMP7 planned Sustainability reduction sites	DIGS	DIGS	29/38/02/46	11.37	11.37	7.88	7.88	No	Yes
	HOLY	STAL	28/39/28/337		9.09	8.20	9.09	No	Yes
	MUDL	STAL	28/39/28/337		11.37	10.03	11.37	No	Yes
	PERI	Individual	28/39/28/401	4.99	5	4.19	4.19	No	Yes
	RUNL (Chalk)	Individual	29/38/01/09	9.55	9.55	6.30	6.30	No	Yes
	CHES	Individual	28/39/28/104	5.22	7.09	5.22	6.00	No	Yes
Removed from AIM list in AMP6	CHAL	GREM	28/39/28/334	4	4.55	4.00	4.50	No	N/A

*removed as an AIM source at the point of AMP6 sustainability reduction.

Some of these sources have individual licences whilst others are part of a group licence. The licence and DO values reflect the situation in September 2015 as since then, our conceptual understanding has improved and sustainability reductions have already been implemented (BOWB reduced to zero as of 1 April 2016, FULL and HUGH reduced to zero as of 1 April 2017,

WHIH reduced to an annual average of 2 MI/d as of 1 April 2017, AMER reduced to an annual average of 4 MI/d as of 1 April 2018 and the combined annual average of MARL and PICC reduced by 6.4 MI/d as of 1 April 2018). Hence the licence and DO values have been adjusted accordingly as shown in Table 5. Where DO has been reduced to zero MI/d, AIM no longer applies to these sources as the impact of abstraction has been mitigated. Where DO has not been reduced to zero MI/d, there remains the potential for a residual abstraction influence and so there is benefit in continuing to assess AIM against a lower AIM baseline. Therefore, FULL, HUGH and BOWB have been removed from the assessment whilst MARL, PICC, WHIH and AMER remain. CHAL source has been removed, as agreed following discussion with the Environment Agency that the potential benefit from an abstraction reduction here is small. The same methodology will be applied when the sustainability reductions planned for AMP7 are implemented.

Some of the sources assessed for AIM are located in the same catchment and have been grouped as shown in Table 4 and Table 5. The groupings have been used as the baseline was calculated based on the performance of AIM sources under historic droughts and this does not necessarily reflect the current operational regime. An example is the BRIC and NETH sources. These now both form baseload sources of the CLAY group and usually abstract at a higher rate than the AIM baseline. In the event of an operational outage at either of the sources, there is a need for the flexibility to increase abstraction at the other, to compensate the lost output. Without the grouping, we would not be able to recoup the lost volume if an outage occurred during a low flow period.

This is also important when calculating the normalised AIM score. The relative size of different abstractions means that if output from one source was increased in response to an outage at a baseload source during a low flow period, without the grouping, the normalised AIM score of the two sources would not balance and the AIM assessment would be inaccurate. Where sources are grouped, the same trigger point is used. This is downstream of both sources in the grouping, such that the benefit of their combined operation can be realised.

Based on the methodology explained in section 2, the calculated or adopted AIM triggers are presented in Table 2.

Table 2. AIM Triggers for Groundwater Sources

Source	Trigger Location	Monitoring Record	Q95 or bespoke trigger (MI/d)	Comments
BRIC	R. Colne at Berrygrove GS	April 1995 – March 2015	13.00	Bespoke trigger based on minimum flows derived from AMP5 Options Appraisal Work
NETH				
WELL	R. Hiz at Hitchin GS	August 1980 – to date	0.26	Trigger based on Q95 adopted from CEH ¹
OUGH				
OFFS				
DIGS (aggregated with FULL)	R. Mimram at Panshanger GS	December 1952 – to date	18.66	Trigger based on Q95 adopted from CEH ¹
HOLY	R. Ver at Colney Street GS	April 1995 – March 2015	7.44	Trigger based on Q95 adopted from CEH ¹
MUDL				
MARL	R. Gade at Croxley Green GS	October 1970 – to date	32.00	Trigger based on HUNT Licence condition for flows at Croxley Green
PICC				
AMER	R. Misbourne at Denham Lodge GS	July 1984 – to date	5.53	Trigger based on Q95 adopted from CEH ¹
WHIH	R. Beane at Hartham Park GS	August 1979 – to date	15.47	Trigger based on Q95 adopted from CEH ¹
CHES	R. Chess at Rickmansworth GS	July 1974 – to date	15.38	Trigger based on Q95 adopted from CEH ¹
PERI	R. Lee at Luton Hoo/East Hyde GS	October 1959 – to date	7.34	Trigger based on Q70 adopted from CEH ¹
RUNL Chalk				
SLIP	R. Rhee at Ashwell GS	November 1965 – to date	Dependent on licensed flow condition	Trigger based on Operating Agreement for Ashwell BH Augmentation
PRIM	R. Dour at Crabble Mill GS	August 1966 – to date	18.06	Trigger based on minimum flows at Crabble Mill as per BUCM Licence condition
BUCKM				
DENG Gravels	DENG Tubewell 19	October 2000 – March 2015	1.78 mAOD	Bespoke trigger based on minimum levels for the nearby wetlands (at 1.35 mAOD in TW33)

The abstraction baseline values have been calculated as the average historic abstraction, based on the period April 1995 to March 2015 when the AIM trigger would have been reached, as set out in Table 2. Where sustainability reductions have not reduced DO to zero MI/d, the AIM baseline has been set as the post reduction annual licence limit, to discourage use of the peak licence still available under low flow conditions. This methodology will also apply to the sustainability reductions planned in AMP7.

It is proposed that the AIM trigger for our SLIP source should vary, depending on flow at Ashwell gauging station on the Rhee and the abstraction rate specified in the licence. To allow for headroom, we usually abstract slightly less than we are entitled to under most of our abstraction licences. With this in mind, the AIM baseline for SLIP has been set at the 95th percentile of the licensed abstraction at the site at any time, assuming that the flow is below 2.55 MI/d (the first step on the table) (see Table 3), so that a benefit can be claimed for any abstraction lower than usual operation during a drought.

Table 3 Moving Baseline at SLIP Source

Flow at Ashwell Gauging Station at National Grid Reference TL 267 401 in litres per second	Maximum Daily Abstraction rate in MI/d	Proposed AIM trigger (95 % of Licensed volume)
Flows above 29.46 (2.55 MI/d)	Up to 6.82	
Between 28.95 and 29.46	5.46	5.18
Between 28.41 and 28.94	5.00	4.75
Between 27.90 and 28.40	4.55	4.32
Between 27.36 and 27.89	4.09	3.89
Between 26.83 and 27.35	3.64	3.46
Between 26.32 and 26.82	3.18	3.02
Between 25.78 and 26.31	2.73	2.59
Between 25.27 and 25.77	2.27	2.16
Between 24.74 and 25.26	1.82	1.73
Between 24.20 and 24.73	1.36	1.30
Between 23.69 and 24.19	0.91	0.86
Between 23.15 and 23.68	0.46	0.43
Less than 23.15	0.00	0.00

NETH and BRIC sources will operate under AIM at a combined daily abstraction of 37.16 MI/d. The 5 MI/d deficit from the current target can be met by the introduction of TOLP and/or the slight increase of EAST, which are part of the same group licence but located down catchment, so in theory are less environmentally sensitive as river flows are higher.

The Hitchin sources (WELL, OUGH and OFFS) currently have augmentation schemes in place, based on level trigger points at Charlton Mill Pond (for WELL) and Oughton Springs (for both OUGH and OFFS). It is proposed that AIM will only apply to the abstracted water for public water supply and not for augmentation, as augmentation is in place to mitigate the abstraction impacts and augmentation should reduce the frequency of the AIM trigger being breached. The EA also operates an augmentation scheme from Bath Springs borehole to the River Hiz downstream of Charlton Mill Pond and upstream of their gauging station. Despite the low augmentation volumes, if this is considered to skew the gauge readings when in operation, then a groundwater level trigger could apply based on the EA observation borehole at Lilley Bottom. The equivalent trigger for flows at Q95 (0.26 MI/d) at Hitchin Gauging station, would be set at 92.4 mAOD based on the

relationship between the groundwater level hydrograph and the river gauge as shown in Figure 1.

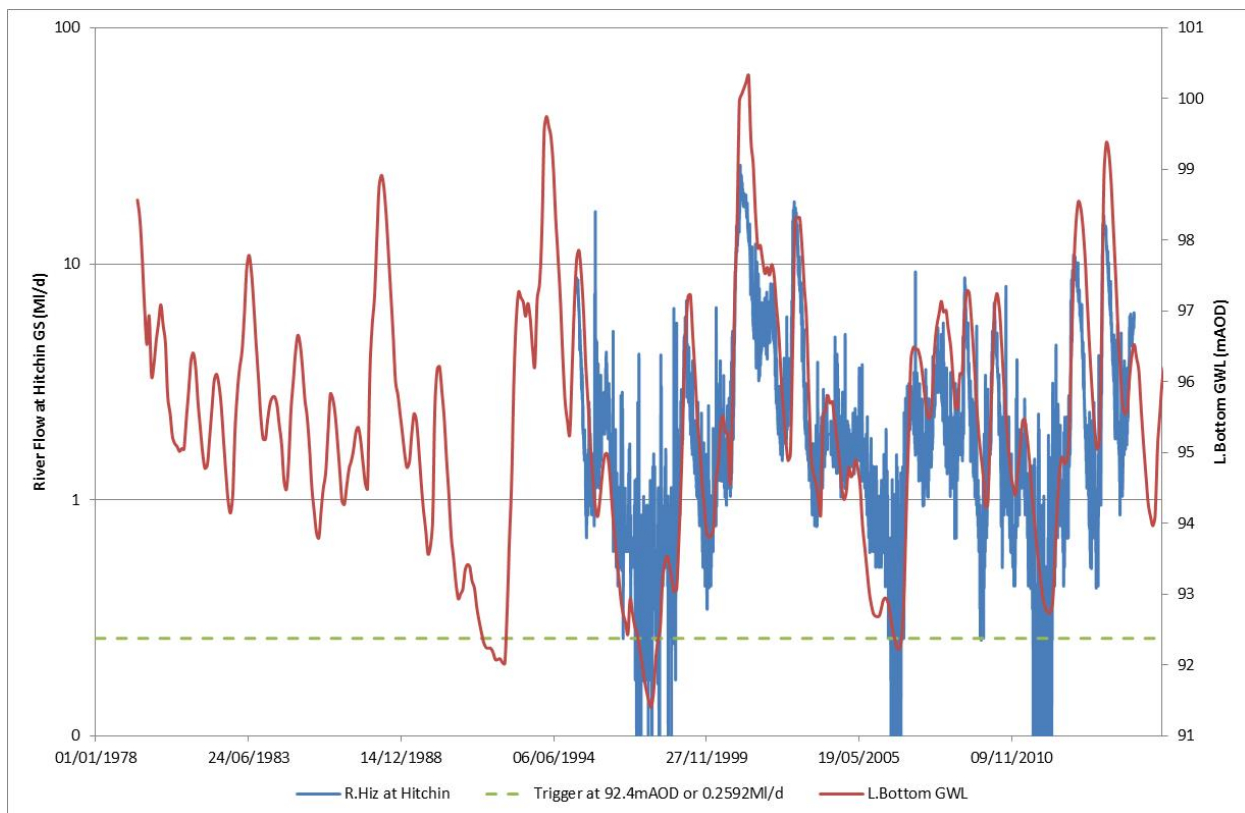


Figure 1: Relationship between River Flows at Hitchin Gauging Station and Groundwater Levels at Lilley Bottom Observation Borehole

The Mimram source (DIGS) will operate under AIM at the baseline abstraction of 7.53 MI/d, based on the Q95 trigger flow at Panshanger Gauging Station. Since September 2017, FULL (also in the Mimram catchment) has been permitted to abstract a small volume of water (<2 MI/d), under low groundwater level conditions for flood management purposes. During such periods, the licence is aggregated with DIGS, to ensure that the 9.09 MI/d sustainability reduction in the Mimram catchment abstraction remains. As a result, the aggregated abstraction for the two sources is reported on for AIM. A sustainability reduction is planned at DIGS in late AMP7. It is proposed that the AIM baseline will remain at 7.53 MI/d until the reduction is implemented.

The Ver sources (HOLY and MUDL) will operate under AIM at the combined output of 17.72 MI/d. Since MUDL is considered operationally as an additional borehole for HOLY and due to their close proximity, it is proposed that the combined AIM baseline will apply instead of the individual baseline values, in order to allow operational flexibility during low flow periods. Sustainability reductions are planned at HOLY and MUDL in AMP7. It is proposed that the combined AIM baseline will remain at 17.72 MI/d until the reduction is implemented. As discussed earlier, it is proposed that AIM will not apply for BOWB since the source has had its licence revoked due to sustainability reductions as of the 1 April 2016.

The Gade sources (MARL and PICC) previously operated under AIM at the combined output of 20.14 MI/d. Following the April 2018 sustainability reduction, the new combined AIM baseline for the two sources is 14.06 MI/d, equivalent to the combined post-reduction annual licensed rates

at the two sources. As the combined daily licence at the two sources is 19.06 MI/d, the AIM baseline will serve to discourage peak abstraction if low flows coincide with a high demand period.

Following the 2018 sustainability reduction, AMER will operate under AIM at the baseline abstraction of 4 MI/d. This is equivalent to the post-reduction annual licensed rate. A further sustainability reduction is planned for late AMP7 at AMER. It is proposed that the AIM baseline will remain at 4 MI/d until the further reduction is implemented. CHAL was previously included in the AIM assessment for the Misbourne catchment but has now been removed following discussions with the Environment Agency.

WHIH source is included in AIM with a baseline of 2 MI/d. This is equal to the post-sustainability reduction annual licensed rate and similar to the Gade sources, the considerable difference between peak and average licensed conditions would serve to discourage peak use during low flow periods.

CHES source will operate under AIM at the abstraction baseline of 4.08 MI/d as calculated by the AIM methodology for flow in the Chess reaching Q95 values at the Rickmansworth gauge. A sustainability reduction planned at the source in AMP7 has been implemented on a voluntary basis as of September 2020. It is proposed that the source is removed from the AIM assessment going forward (from 2021-22 onwards), since the reduction has resulted in zero DO (full cessation).

HUGH source has had a sustainability reduction imposed on the 1 April 2017 (full closure). As such, AIM has ceased to apply.

Sustainability reductions are planned in AMP7 for the Upper Lea sources (RUNL Chalk and PERI). It is proposed that the combined AIM baseline of the two sources will be 9.94 MI/d until the reductions are implemented.

BUCM source has a licence condition that requires augmentation to the River Dour during low flow periods. However, since both this and PRIM are located in the same part of the catchment, it is proposed that when the trigger is reached at Crabble Mill gauge, that both sources will operate under AIM at the combined abstraction of 6.50 MI/d. This was adopted based on the anticipated increased demand in this zone due to housing developments. This volume is still lower than the combined DO for the two sources by 0.5 MI/d. It needs to be noted, that as mentioned above for sources that have river support schemes, the AIM baseline will apply to the volume of water into supply and not the augmentation volume. This will apply to BUCM only as there is no augmentation capability from PRIM.

DENG source will operate at the AIM baseline of 6 MI/d as per the new average licence implemented on the 1 April 2015. This is a voluntary licence reduction by 3 MI/d at average (previous licence at 9 MI/d average), so the AIM baseline is adjusted to reflect the new operational pattern.

All triggers and AIM abstraction baseline values for the AIM sources are shown in Table 4. It should be noted that both the triggers and the baseline values are subject to consultation and may need to be reviewed following this procedure. At present, they are thought to be robust based on the current knowledge of the catchments and the historic and future use of the sources under low flow conditions. Periodic reviews of the AIM sites will take place in order to validate both the triggers and the abstraction values. The review of the AIM sites for the financial year of 2020-21 is discussed in Section 4.

Table 4. AIM Baseline Abstraction versus Triggers

Source	Catchment	Combined AIM baseline (MI/d)	AIM baseline (MI/d)	Average Deployable Output based on 1 in 10 year drought (MI/d)	Operational Site Target (MI/d)
BRIC	Colne	37.16	18.65	14.00	15.00
NETH			18.51	28.00	27.00
WELL	Hiz	5.03	0.84	1.15	1.70
OUGH			4.43	4.10	4.55
OFFS			0.60	0.00	1.00
DIGS (aggregated with FULL)	Mimram	7.53	7.53	7.88	8.00
HOLY	Ver	17.72	10.29	8.20	8.00
MUDL			7.43	10.03	10.00
MARL	Gade	14.06	8.34	8.34	8.34
PICC			5.72	5.72	5.72
AMER	Misbourne	4.00	4.00	4.00	4.00
WHIH	Beane	2.00	2.00	2.00	2.00
CHES	Chess	4.08	4.08	5.22	5.22
PERI	Upper Lee	9.94	3.36	4.19	4.50
RUNL Chalk			6.58	6.30	6.30
SLIP	Rhee	95% of licensed abstraction	95% of licensed abstraction	0.00	4.50
PRIM	Dour	6.50	2.50	3.00	2.50
BUCM			4.00	4.00	3.50
DENG Gravels	Denge	6.00	6.00	4.65	5.00

4 Abstraction in 2020-2021 versus AIM Baseline

A periodic review of the AIM triggers and baseline abstraction is undertaken on a monthly and annual basis in order to validate the selected values. Table 5 below shows the actual abstraction figures for 2020-21 against the AIM baseline values.

Table 5. AIM baseline Abstraction versus Actual Abstraction in 2020-21

Source	Catchment	Combined AIM baseline (MI/d)	AIM baseline (MI/d)	Actual Abstraction (2020/21) (MI/d)		AIM Performance (MI)	Normalised AIM Performance	Number of days flow below the trigger	
BRIC	Colne	37.16	18.65	11.75	38.98	NA	NA	0	
NETH			18.51	27.23					
WELL	Hiz	0.84	0.84	1.52 (excludes augmentation)		NA	NA	0	
OUGH			5.03	4.43	0.00				0.97
OFFS				0.60	0.97				
DIGS plus FULL	Mimram	7.53	7.53	9.43		NA	NA	0	
WHIH	Beane	2.00	2.00	2.00		NA	NA	0	
HOLY	Ver	17.72	10.29	7.86	16.83	NA	NA	0	
MUDL			7.43	8.97					
MARL	Gade	14.06	8.34	0.03	12.72	NA	NA	0	
PICC			5.72	12.69					
AMER	Misbourne	4.00	4.00	3.95		NA	NA	0	
CHES	Chess	4.08	4.08	1.17		NA	NA	0	
PERI	Upper Lea	9.94	3.36	3.02	6.68	-303.36	-0.24	128	
RUNL Chalk			6.58	3.66					
SLIP	Rhee	95% of licensed abstraction	95% of licensed abstraction	5.22 (excluding augmentation)		-0.95	-0.18	1	
PRIM	Dour	6.50	2.50	1.51	2.99	NA	NA	0	
BUCM			4.00	1.48					
DENG Gravels	Denge	6.00	6.00	5.47		NA	NA	0	
				TOTALS		-304.31	-0.42	129	

Background groundwater levels generally exceeded the long-term average (LTA) from March 2020 to March 2021 but briefly dropped below the LTA in September 2020 following the summer 2020 recession. The groundwater levels followed a rising trend from October 2020 to March 2021. Similarly to the 2019-20 recharge period, this was due to significant winter rainfall and rapid recovery during the 2020-21 recharge period likely of a similar magnitude to winter 2013-14. Due to above average groundwater levels, only three AIM triggers in two catchments were active in the 2020-21 reporting period, a significant reduction from the ten catchments that were active in 2019-20, a below average groundwater level period.

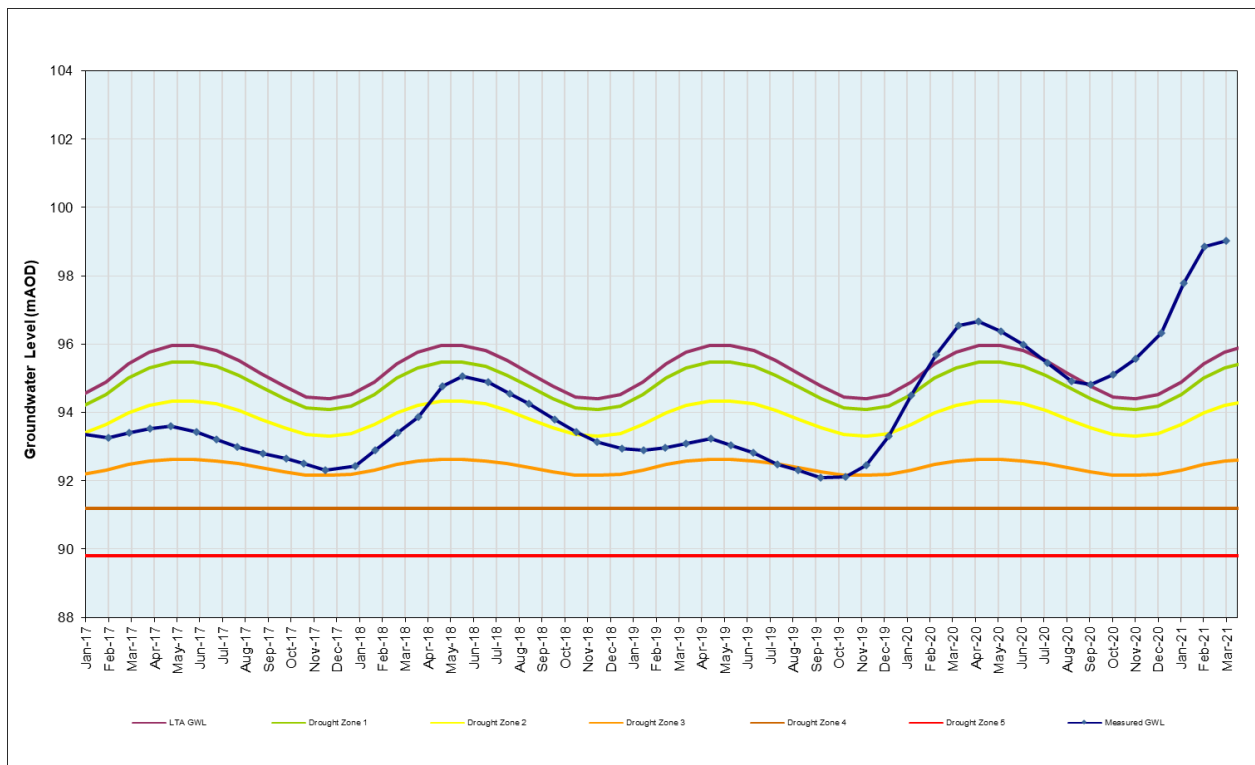


Figure 2: Background Groundwater Level Fluctuations Measured at the Environment Agency Observation Borehole at Lilley Bottom

Table 5 states the number of days in 2020-21 that each AIM trigger was active. This can be used to assess how sensitive each trigger is to drought and how spatially variable a drought is. It can be seen that the Upper Lea trigger was active for the most days during 2020-21 (128 days). The only other trigger that was active in 2020-21 was the Rhee trigger for 1 day. No other triggers were activated in 2020-21.

As specified in the AIM guidelines document from Ofwat, the AIM performance is measured based on the difference between the actual and the baseline abstraction, multiplied by the number of days when flows were at or below the trigger threshold (see equation below).

AIM performance in MI = (average daily abstraction during period when flows are at or below the trigger threshold - baseline average daily abstraction during period when flows are at or below the trigger threshold) * length of period when flows are at or below the trigger threshold.

In order to allow for comparison of the AIM performance between abstraction sites, either within the company or between water companies, the performance on the AIM is normalised by the

baseline average daily abstraction and the length of time for which flows were at or below the trigger threshold. This is because the guidelines suggest that a performance of -1MI is better if the AIM baseline is smaller or if the period for which flows are at or below the trigger threshold is shorter. The equation for the Normalised AIM performance is given below as proposed by Ofwat.

Normalised AIM performance = AIM performance / (baseline average daily abstraction * length of period when river flows are at or below the trigger threshold)

As such, when applying the two equations above to measure the AIM performance and the normalised AIM performance for RUNL Chalk and PERI for 2020-21, the AIM performance is -303.36 MI and the normalised performance is -0.24. The negative figure signifies an improved performance as average abstraction was lower than the baseline, over the 128 days that AIM was in effect, equating to a daily outperformance of 2.37 MI/d compared to historic drought periods. This is the highest outperformance figure of all the AIM sources. Both RUNL Chalk and PERI sources are situated in the Upper Lea catchment. The under-abstraction compared to the AIM baseline is mainly attributed to regular abstraction below the baseline at the two sources combined in addition to good operational management.

SLIP source is assessed based on the trigger at Ashwell gauging station on the Rhee. Flow here was below the trigger for 1 day during 2020-21. On 27th September 2020, our AIM score was -0.95 MI and our normalised AIM score was -0.18, therefore we abstracted 0.95 MI/d less than the rolling AIM baseline for the day the trigger was in effect. The negative figure signifies an improved performance as average abstraction was lower than the baseline.

In 2020-21, the trigger for 16 of the sources was not activated (Table 5). This is the highest number of sources that were not activated since AIM came into effect in April 2016. This is a reflection of the hydrological conditions experienced in 2020/21 (i.e. high groundwater levels).

In summary, for the 3 AIM sources that the trigger was reached during 2020-21, the global AIM performance was -304.31 MI and the global normalised AIM performance was -0.42. This suggests that the company met and exceeded the AIM performance figures for this period.

Following the quarterly and annual review of the AIM triggers and baseline abstractions, it appears that they are robust and representative of the catchment status. The validity of the triggers and baseline abstraction is constantly monitored. Since the start of AMP7 in April 2020, the global AIM score is calculated and tracked on a monthly basis and an end of month forecast is produced and updated.

5 References

1: <http://nrfa.ceh.ac.uk/data/search>

