Appendix 5 – Using water efficiently: Response to IAP

Wessex Water

March 2019

Wessex Water
YTL GROUP

Summary

This appendix provides additional evidence in relation to Ofwat's cost assessment for leakage.

We understand that leakage has a level of political importance over and above some other measures and that companies should not be seen to benefit from a perceived failure. We consider however that in our case there is a strong case for making an additional cost allowance above the implicit funding for leakage control allowed in the base cost models.

The table below summarises the additional evidence provided, our response to the cost assessment in the initial assessment of plans received in January 2019, and the actions that we would like Ofwat to consider in the draft determination.

Ofwat model / Driver	Value challenged £m	Our response	Suggested actions for Ofwat
Leakage (WS2 line 13) • Reducing leakage by 15% between 2020 and 2025. This requires a reduction in distribution losses of 10.5 Ml/d.	25.3	We do not agree with Ofwat's assessment that a step change in leakage performance can be achieved through its IAP base cost allowances i.e. with no additional funding. While we can see a case not to make additional allowances above the base level for some companies to cut leakage further, we consider that there is a strong case for allowing the efficient costs of a step-change in leakage reduction for a company with our overall efficiency and track record of delivery in this area. We provide evidence to demonstrate historical leakage performance and	Reconsider leakage allowances ensuring that sufficient allowance is made in costs over and above the allowances calculated from the base models to deliver the step-change in leakage. Line-by-line review of all dimensions of service quality (including leakage) to come to an evidence-based view on what level of performance is funded by the allowances from models of historical base costs.

		provide comments on the cost assessment approach for leakage in the IAP.	

In addition we include an external report we have commissioned on our approach to the PCC performance commitment.

Contents

1. Introduction

This document provides our response to Ofwat's initial assessment of plans (IAP) published on 31st January 2019 with respect to using water efficiently, particularly regarding leakage.

Relevant sections of our September 2018 submission include section 5.6.3 of our main business plan narrative *For You For Life*, *Supporting document 5.2 – Using water efficiently* and a cost adjustment claim *Appendix 8.8.A – Claim WSX04 – reducing leakage by a further 15%.*

Supporting the efficient use of water in our region is a key priority for us. Ensuring that water is used as efficiently as possible not only lessens our impact on the environment by managing abstraction and lowering carbon emissions from treating and pumping less water through our network, it also helps strengthen the resilience of our supply system to periods of dry weather.

To underpin our outcome for the efficient use of water we have developed stretching and, in places, industry leading performance commitments to:

- Reduce leakage by 15% by 2025
- Fix 90% of customer reported leaks by the end of the next working day
- Reduce per capita consumption to 127.9 litres per person per day by 2025
- Deliver water efficiency savings amounting to 5 Ml/d by 2025.

This document provides additional evidence and responses in relation to the cost assessment for leakage. Following some initial comments on the approach that Ofwat have taken in the IAP, it is structured around the following headings:

- Historical leakage performance
- Our PR19 proposals
- Ofwat's cost assessment, and
- Suggested actions for Ofwat.

In addition, we include an external report we have commissioned on our approach to the PCC performance commitment.

2. Leakage

2.1 The approach to leakage in the IAP

In the IAP, Ofwat's assessment of leakage costs assumes that a 15% reduction in leakage can be achieved by all companies from their base expenditure allowances.

However, we consider that Ofwat's approach is inappropriate in our case on two counts. Firstly, there is no explicit justification for enhancement allowances only being granted for leakage reduction above 15%. Secondly, we do not agree that the base allowances are sufficient to deliver step changes in performance.

The assessment of companies' leakage enhancement costs is then based on several separate tests and a unit cost calculation:

- Test A: Is the company proposing a reduction of more than 15 per cent? If so, make an allowance for leakage reduced beyond 15 per cent.
- Test B: Is the company proposing to achieve levels of leakage by 2024/25 that place it at, or better than, the upper quartile for both of two normalised measures:
    - B1: Leakage per km of mains (m3/km/day)
    - B2: Leakage per property (l/property/day)

  If so, make an allowance for leakage that goes beyond that upper quartile.
- Funding, where the tests are satisfied, is on the basis of an assessment of the industry forecast median unit costs or the company proposed unit cost if that it is lower.

In section 3.3.4 of our main response document we set out our response to the IAP challenge that base cost models include sufficient allowance (capex and opex) for enhancing common performance commitment service levels and cutting leakage by 15 %. We conclude that the IAP assessment does not make sufficient cost allowance in the base costs for reducing leakage by 15%. In practice for Wessex Water, as a company assessed as upper quartile efficient on base costs, if retained this would be an additional frontier shift on top of the published 1.5% per year productivity challenge.

We consider that there is a strong case for allowing the efficient costs of a step-change in leakage reduction for a company with our overall efficiency and track record of delivery on leakage.

Our business plan and Water Resources Management Plan included detailed descriptions of our approach to leakage and proposed investment plans, which we are not repeating here. However, in the following sections we summarise:

- Our historical leakage performance in comparison with the industry to highlight that we have an excellent track record, which we intend to build on in the next period – refer to section 2.2
- A brief summary of our proposals – refer to section 2.3
- Ofwat's costs assessment and our suggested action for Ofwat – in sections 2.4 and 2.5.

2.2 Historical leakage performance

Our leakage performance is exemplary:

- Since the mid-1990s we have halved the amount of water that leaks from our network
- We have always met our leakage target
- We have a resilient water supply system, as evidenced by the fact that we have not had a hosepipe ban since 1976 and have maintained supplies throughout severe events such the Beast from the East
- In addition to leakage control, we have customer facing policies such as our commitment to fix 90% of customer reported leaks within a day.

This is relevant in this context as Ofwat has chosen two specific measures of absolute leakage as criteria for determining whether additional cost allowances will be made. While there is no explicit justification for this we understand that it may be to ensure that there is no sense that companies who have previously failed on leakage are being rewarded for failure. Our argument here is that absolute leakage levels does not give a full enough picture of company leakage performance and ignores a much wider context. Once this is taken into account, Ofwat can be more confident in making sufficient allowance for delivering a step-change in leakage that is cost-beneficial in Wessex Water's determination.

2.2.1 Leakage targets

We have always met our regulatory leakage reduction targets.

As shown in Table 2-1 below, out of ten WASCs, only two companies have met their leakage target in every one of the past ten years; the remaining companies have failed their targets in one or more years in the ten years. Of the two companies that have consistently met their leakage targets, one has had flat targets. We are the only company to have consistently met our leakage targets whilst having a significantly reducing target (5% reduction over the period 2015 to 2020).

Table 2-1: Industry performance against agreed targets (Ml/d)

Leakage	2008-09		2009-10		2010-11		2011-12		2012-13		2013-14		2014-15		2015-16		2016-17		2017-18	
	Target	Outturn	Target	Outturn	Target	Outturn	Target	Outturn	Target	Outturn	Target	Outturn	Target	Outturn	Target	Outturn	Target	Outturn	Target	Outturn
Affinity															183.9	180.9	178.5	173.0	173.1	172.7
Anglian	210.0	211.0	210.0	211.0	212.0	230.0	212.0	199.0	212.0	189.0	212.0	193.0	212.0	192.0	192.0	189.0	192.0	186.0	192.0	183.0
Bournemouth															21.5	N/A	N/A	19.0	N/A	19.1
Bristol															48.0	44.2	47.0	46.4	45.0	46.6
Cambridge															13.5	13.2	13.5	14.3	13.5	14.4
Welsh Water	195.0	194.0	195.0	193.0	190.0	199.0	190.0	185.0	190.0	185.0	190.0	184.0	190.0	180.0	181.0	180.0	177.0	175.0	173.0	172.9
Essex & Suffolk															66.0	62.4	66.0	68.1	66.0	66.2
Hafren Dyfrdwy															90.8	85.0	90.8	96.5	90.8	92.5
Northumbrian	217.0	217.0	216.0	223.0	216.0	223.0	216.0	189.0		136.0		134.0		137.0	139.0	134.7	137.0	133.8	137.0	137.1
Portsmouth															30.0	28.1	30.0	30.4	29.9	32.9
SES Water															24.4	24.2	24.3	24.3	24.2	24.2
Severn Trent	520.0	491.0	520.0	497.0	483.0	497.0	483.0	464.0	483.0	441.0	483.0	441.0	483.0	441.0	444.0	434.0	439.0	432.0	434.0	443.0
South East															91.8	88.1	90.9	88.6	90.0	87.7
South Staffs															70.5	69.9	70.5	69.9	70.5	72.4
South West	84.0	84.0	84.0	82.0	84.0	84.0	84.0	81.0	84.0	84.0	84.0	84.0	84.0	84.0	84.0	84.0	84.0	82.0	84.0	83.0
Southern	92.0	87.0	92.0	95.0	83.0	92.0	83.0	82.0	83.0	81.0	83.0	85.0	83.0	82.0	88.0	N/A	N/A	88.1	N/A	88.7
Thames	715.0	698.0	690.0	670.0	674.0	665.0	674.0	637.0	674.0	646.0	674.0	644.0	674.0	654.0	649.0	642.5	630.0	677.0	620.0	695.0
United Utilities	465.0	462.0	465.0	462.0	454.0	464.0	454.0	453.0	454.0	457.0	454.0	452.0	454.0	454.0	462.7	451.7	462.7	439.3	462.7	453.5
Wessex	74.0	72.0	74.0	74.0	71.0	71.0	71.0	69.0	71.0	69.0	71.0	69.0	71.0	69.0	69.3	68.3	68.6	68.3	67.9	67.7
Yorkshire	295.0	295.0	295.0	295.0	297.0	325.0	297.0	274.0	297.0	265.0	297.0	282.0	297.0	288.0	297.1	285.1	297.1	295.2	297.1	300.3

2.2.2 Leakage reductions

Since the mid-1990s we have halved the amount of water that leaks from our network; around a 30% bigger reduction than the industry average reduction over the same period.

Table 2-2 below shows historical performance for leakage across the industry.

Table 2-2: Comparison of leakage reductions

Company	Reported leakage m^3/km/day		
	1994/95	2016/17	% reduction
Welsh	15.5	6.4	59%
Wessex	**12.9**	**5.7**	**56%**
Yorkshire	19.4	9.3	52%
UU	21.7	10.5	52%
Severn Trent	16.2	9.2	43%
South West	9.5	5.5	42%
Thames	34.7	21.6	38%
Southern	10.2	6.4	37%
Bournemouth	10.2	6.8	33%
Northumbrian	11.5	7.8	32%
South Staffs	17	11.6	32%
Anglian	6.9	4.8	30%
South East	8.7	6.1	30%
Bristol	9	6.9	23%
Portsmouth	10.1	9.1	10%
Weighted average	**16.1**	**9.1**	**43%**

We also note that of the other companies judged to be upper quartile efficient in Ofwat's base cost models, reported leakage at Yorkshire and South West has increased over the period 2011/12 to 2017/18; and as shown in Table 2-3 below Yorkshire, Portsmouth and Dee Valley all missed their leakage targets last year.

Table 2-3: Recent leakage performance

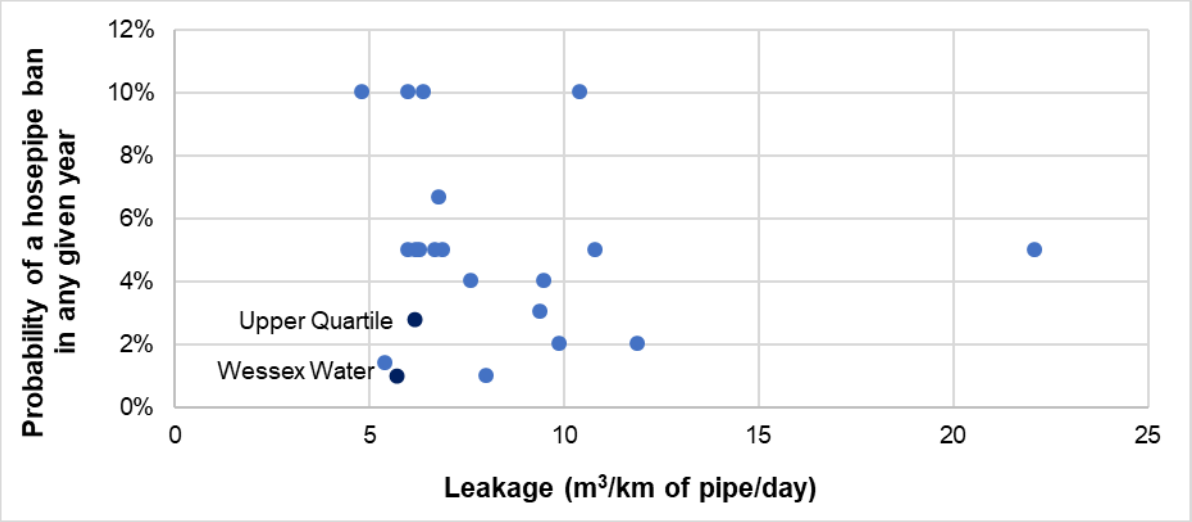
Company Name	Commitment (Ml / Day)		Performance
	2017-18	2019-20	2017-18 Actual[8]
Affinity Water	173	162	173
Anglian Water[1]	192	192	183
Bristol Water	45	43	50
Bournemouth Water[2]	-	20	19
Dee Valley Water[3]	91	91	93
Northumbrian Water	137	137	137[9]
Northumbrian Water (E&S)[4]	66	66	66[10]
Portsmouth Water	30	30	33
SES Water	24	24	24
South East Water	90	88	88
Southern Water[5]	-	87	89
South Staffs & Cambridge Water	71	71	72
South Staffs & Cambridge Water[6] - Cambridge region	14	14	14
Severn Trent Water	434	424	443
South West Water	84	84	83
Thames Water	620	606	695
United Utilities Water[7]	-	-	454
Dŵr Cymru	173	169	173
Wessex Water	68	67	68
Yorkshire Water	297	287	300

Source: Ofwat Service and Delivery Report January 2019

2.2.3 Leakage indicators

We are one of the best performers when leakage is measured per km of pipe. At the same time, we have the lowest probability of hosepipe bans in the country at <1% (see Figure 2-1 below) and we have assessed our supplies as resilient to a 1 in 200 year drought.

Figure 2-1: Leakage by km of pipe and probability of hosepipe ban in a year for water supply companies in the UK



The table below shows leakage levels reported by mains length for 2017/18 with Wessex Water the second best performer in the industry, which in the context of not being a water stressed company and operating significantly below our SELL represents industry leading performance.

Table 2-4: Leakage per km

APR 2018 Reported Leakage	m3/km/day
Anglian	4.8
Wessex	5.7
South East	6.0
Dŵr Cymru Welsh Water	6.3
South West	6.3
Southern	6.4
Bristol	6.8
SES Water	6.9
Northumbrian	7.8
Severn Trent	9.4
Yorkshire	9.5
Portsmouth	9.9
South Staffs	10.2
Affinity	10.4
United Utilities	10.8
Thames	22.1
Upper Quartile	**6.3**

2.2.4 Leakage expenditure

At PR14 we agreed to reduce leakage by 5% over the five years of the price control. The expenditure required to deliver this performance has been increasing each year.

We estimate that the total cost in PR14 will be up to £100m. This cost will continue throughout PR19 just to hold leakage at the end of period position. Our leakage totex in PR09 was around £70m.

2.3 Our PR19 proposals

As detailed in *Supporting document 5.2 – Using water efficiently* and our Water Resources Management Plan and summarised in the Table 2-5 below we have looked at a wide range of leakage reduction options and calculated the Average Incremental Cost (AIC) of each option in accordance with the WRMP guidelines.

Table 2-5: Leakage options

Option	Description	AIC (p/m3)
ALC1	Innovation and optimisation of existing Active Leakage Control	-9
ALC3	ALC Optimisation through better data	71
ALC2a	Increased Active Leakage Control activity (2Ml/d)	96
AM2	Better DMAs	96
PM1	Pressure management optimisation	107
ALC2b	Increased Active Leakage Control activity (5Ml/d)	146
AM1a	Leakage driven asset renewal (2Ml/d)	186
AM1b	Leakage driven asset renewal (4Ml/d)	210
AM1c	Leakage driven asset renewal (9Ml/d)	272
AM3	Near real time monitoring and decision support	280

The most cost efficient and effective options were chosen to meet the required performance outcome of reducing leakage by 15%.

Ranking these options by their AIC allowed us to identify the optimal mix of schemes to achieve the required 15% target reduction in the most cost effective manner as summarised in Table 2-6 below.

Table 2-6: Mix of schemes to achieve 15% reduction in leakage

Option	Cumulative Yield Ml/d	Cumulative Capex £m	Cumulative Opex £m/yr
ALC1	1	0	0
ALC3	3	1.8	0.30
ALC2a	5	3.6	0.59
AM2	7	9.3	0.94
PM1	9	17.9	1.51
ALC2b	10.5	19.8	1.83

The total transitional totex of £25.3m is based on £19.8m capex plus opex rising evenly over the five year period from £0.37m in Year 1 to £1.83m in Year 5.

We have deducted the cost saved by reduced production volumes on the basis of the volume of water saved over five years (12,500 Ml) multiplied by the short run marginal cost (£97 per Ml). Thus, the costs set out in the table above are net costs.

2.4 Ofwat's cost assessment

2.4.1 Assumption that base cost models include sufficient funding (capex and opex) for reducing leakage by 15%

We consider that Ofwat has not made sufficient allowance for leakage (either opex or capex) in its IAP. We have been allowed no additional funding to deliver a 15% reduction in leakage.

We do not see any theoretical basis, or evidence, for the IAP view that the base cost allowances provide sufficient funding for projected future step changes in performance. A possible exception to this is if it was possible to change the mix of activities and associated expenditure such that funds could be diverted to address the future step change. This is not feasible in leakage (or the other service metrics requiring step changes) for the following reasons:

- The current leakage strategy and expenditure has to continue to maintain the current level of leakage.
- The proposals to reduce leakage (outlined in section 2.3 above and in our September 2018 submissions) require investment in network changes, and in data acquisition and analytics. These activities are all **in addition** to the current set of leakage control activities.

Our view is that the base service costs models can only allow for the costs of continuing to perform at the level the industry has achieved over the period used for the base service cost assessment.

We note that we have already accounted for innovation in our proposals for leakage reduction (ALC1) and expect to be able to deliver 1Ml/d of leakage reduction at no extra cost.

Ofwat do not use leakage as an explanatory variable in their base cost assessment models. As a result, it could be deduced that the model allows for a hypothetical company with industry average levels of leakage.

Figure 2-7 below shows the average leakage reduction over the period used for cost modelling. It shows that the industry historical reduction is close to zero.

Figure 2-7: Average leakage reduction over period used for cost modelling

Total leakage Ml/d	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	%Reduction over period
Anglian	199	189	193	192	183	185	183	8%
Dwr Cymru	185	185	184	180	180	175	173	6%
Severn Trent	464	441	441	441	434	432	443	5%
Wessex	69	69	69	69	68	68	68	2%
United Utilities	453	457	452	454	452	439	454	0%
South West	81	84	84	84	84	84	83	-2%
Northumbrian	189	190	192	198	197	202	203	-7%
Southern	82	81	85	82	84	88	89	-8%
Thames	637	646	644	654	642	677	695	-9%
Yorkshire	274	265	282	288	285	295	300	-10%
WaSC total	2633	2607	2626	2642	2609	2646	2691	-2%
Bournemouth	22	21	21	21	20	19	19	12%
Bristol	43	42	44	45	44	46	50	-15%

Thus, we conclude that the base service cost allowances are only sufficient to maintain existing leakage levels, because:

- historical performance over the period used for cost modelling is close to zero i.e. maintaining current levels of leakage, and
- there are no other explanatory variables in the base service econometric models that explain leakage reduction
- the activities required to deliver the step change are in addition to the current activities and funds cannot be diverted from base cost to deliver the new investments.

The fact that the industry has stepped up to deliver a 15% reduction in leakage does not mean that it can be done without cost. To achieve the reduction requires additional active leakage control and pressure management supported by investments in improved network monitoring and data systems, and analysis and decision support tools – an additional cost.

In our summary response document, we also analyse the comparative absolute leakage performance of each of the companies assessed as upper quartile efficient in the base models. This analysis gave no evidence to suggest that upper quartile efficiency is in any way correlated with upper quartile absolute performance in the absolute level of leakage. We have also noted above that their record on leakage measured in other ways is also mixed. This adds further weight to the view that base cost allowances do not give sufficient cost allowances to deliver a step-change in leakage reduction for companies that are already operating at average levels of performance or above. Without making a specific adjustment for this item Ofwat is effectively applying an additional productivity challenge.

2.4.2 Unit costs

We have reviewed the supply-demand balance enhancement feeder models and summaries pack.

We have concerns about the derivation of unit costs in the SDB feeder model. On page 15 of the summary pack Ofwat set out the derivation of their triangulated unit cost of £1.6m per Ml/d of leakage reduction. This is based on the average of three median values:

- The median of companies PR19 SDB enhancement costs. In our case £25.3m for 10.49 Ml/d of distribution losses, which equals £2.42m per Ml/d
- The median of the companies' leakage standard underperformance incentive rates expressed as a unit cost
- The median of companies' standard outperformance incentive rates expressed as a unit cost.

We don't consider that it is appropriate to triangulate a leakage unit cost based on companies' investment proposals and the unit costs derived from the performance commitment under- and outperformance incentive rates, as the latter are also based on an assessment of the benefits using customer valuations which will reflect local customer priorities. It would appear that this approach mixes up costs and benefits.

2.5 Suggested actions for Ofwat

We consider that there is a strong case for allowing the efficient costs of a step-change in leakage reduction for a company with our overall efficiency and track record of delivery.

We request that Ofwat considers these issues again when it calculates our draft determination, ensuring that sufficient allowance is made in costs over and above the allowances calculated from the base models to deliver the stretching and step-change levels of performance proposed. In line with the suggestions in Reckon's report on opex we recommend that Ofwat goes line-by-line through all dimensions of service quality (including leakage) and environmental performance and comes to an evidence-based view on what level of performance it considers is funded by the allowances from models of historical base costs.

Ofwat should also recognise that, with ongoing efficiency reflected in a 1.5% productivity challenge, efficient upper quartile companies will need additional costs to achieve the future leakage targets.

3. Per capita consumption (PCC)

We have consulted with Artesia regarding our approach to the PCC performance commitment and dead bands. They have confirmed that the three-year annual average cannot remove the inter-annual variability in PCC due to the weather, which is outside of the company's control. Their analysis highlights that the dead bands reduce the risk of failure from summer peaks outside the company's control, but they do not remove all that risk.

A copy of their report is included in Annex 1.

4. Annex 1 – Artesia report on PCC performance commitment, March 2019

Wessex Water *Technical note* artesia

Comments on "PCC Performance Commitment: forecast uncertainty due to the weather and dead-bands"

Project no.:	2366	**Date:**	26/03/2019
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Reviewed by:	Dene Marshallsay	**Reference:**	AR1256

1 Introduction

Wessex Water have asked Artesia to review and provide comments on the document entitled "PCC Performance Commitment: forecast uncertainty due to the weather and dead-bands". This note summarises our comments.

2 Comments

The three-year annual average cannot remove the interannual variability in PCC (per capita consumption) due to weather. It does dampen the effect but should not be used as a normalisation method for PCC.

The impact of the 2018 summer is likely to be a 5.8% increase on the annual average PCC for 2018-19. This will increase the three-year rolling average PCC by approximately 2%.

The increase in PCC during peak summer weather is largely outside of the company's control (unless it is during a period of drought) and is not predictable or controllable with any certainty.

Therefore, one or more periods of peak summer weather (such as that seen in 2018) could result in a PCC target failure outside of the company's control, even with the use of the three-year annual average metric.

The best solution to this would be to model the PCC demand response to weather and use this to normalise the annual reported PCC. The performance commitment does not allow for this currently. However, we believe this would be worth doing in order to explain how PCC responds to different weather influences and the knock on effect on PCC targets.

Wessex Water have proposed an alternative approach in which dead-bands have been created to quantify the uncertainty due to weather. Without a full weather model, the approach taken by Wessex Water using a stochastic modelling approach seems a reasonable methodology.

The resulting dead-bands have a raised profile for the first year of AMP7 to compensate for the impact of the summer of 2018 on the three-year average PCC in year one of AMP7 (shown by the orange dot in Figure 1).

The dead-bands show that the impact from one extreme summer similar to 2018 will still result in a potential failure in one or more years (shown by the green line in Figure 1). However, the dead-bands do reduce the risk of failure in a less extreme summer.

Overall the dead-bands reduce the risk failure from summer peaks outside the control of the company, however they do not remove all of that risk.

Figure 1 PCC commitment with dead-bands and potential impact from one extreme summer