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## WWF-UK's comments on Ofwat's Consultation: 'Setting Price Controls for 2015-2020 – business planning expectations: a consultation'

Ofwat issued its 'Setting Price Controls for 2015-2020 – business planning expectations: a consultation' documentation in April 2013. The consultation, which is open until the 23<sup>rd</sup> of May 2013, sets out Ofwat's proposed approach to reviewing Water Companies Business Plans for the period 2015-2020. It requests feedback to help inform the development of the final proposals ahead of publication in the summer.

This document sets out WWF-UK's response to Ofwat's consultation. We have focused on the specific parts of the proposals in which we have most interest, namely:

- The incentivisation of environmental outcomes. We are pleased to see explicit reference at the outset that a 'high quality business plan' should be designed to deliver good outcomes for the environment as well as customers, but would welcome continued emphasis throughout the remainder of the guidance. For example, our opinion is that it is essential that environmental considerations are integrated into the risk based review, which currently reflects only risks to customers and companies.
- The Abstraction Incentive Mechanism (AIM) We are concerned the methodology currently proposed for the AIM is narrowly focused only on the most at risk sites; and, only incentivised action when water levels had already dropped to very low levels. This approach risks displacing water abstraction to adjacent at risk sites; and, fails to trigger the early action required to preserve the resilience of groundwater-based systems. We understand that Ofwat's main concern with regard to the AIM is the level of complexity. We have made several suggestions in our response to significantly reduce the complexity in comparison to Ofwat's current proposals.
- The Restoring Sustainable Abstraction (RSA) programme We are disappointed that direction as to whether the Restoring Sustainable Abstraction (RSA) programme is to be directly funded through PR14 is not included in the guidance. We believe that bringing the RSA process into PR14 will provide the most cost effective solution to address the legacy of unsustainable abstraction.

## **Overall approach**

WWF-UK welcomes the proposal to develop an approach to the review of business plans that gives Water Companies greater freedom to innovate, and to pursue outcomes that meet the needs of customers and the environment. Providing companies with greater control over the means to deliver outcomes, and incentives and freedom to find innovative and sustainable solutions to the management of water resources has our full support.

We are pleased to see explicit reference at the outset that a ‘high quality business plan’ should be designed to deliver good outcomes for the environment as well as customers. But the need to deliver good environmental outcomes receives significantly less attention and emphasis thereafter than does the need to deliver good outcomes for customers. We would welcome more emphasis on ways to incentivise and support the attainment of good environmental outcomes, which could perhaps be achieved through inclusion of environmental benefits as one of the high level groups of tests to be made, and integration of environmental considerations into the risk based review, which currently reflects only risks to customers and companies. We believe that Ofwat should look at the possibility of considering incentives based around higher rates of return for companies trying more innovative, higher-risk solutions, particularly where these have additional environmental and social benefits.

We support the greater emphasis on customers’ views and welcome the use of Customer Challenge Groups (CCG) to assess the effectiveness of companies’ customer engagement process, and how well their business plans reflect customer views and priorities. WWF-UK and a number of Blueprint for Water colleagues are members of CCGs. We feel CCGs would benefit from greater guidance from Ofwat on the nature and extent of their remit, and on the content of their assessment reports to companies. It is particularly disappointing that water companies did not use CCG’s more in the phrasing of questions used in willingness to pay (and willingness to accept) studies, and in the design and analysis of quantitative research exercises.

## **The Abstraction Incentive Mechanism (AIM)**

WWF-UK welcomes Ofwat’s focus on the value of water as a key future challenge for the water industry. In particular, we welcome the work that Ofwat have devoted to the development of the AIM. We do however lament the fact that the current approach proposed for the AIM is focussed only on the most at risk sites identified by the Environment Agency (‘Band 3’ sites) and uses only a single threshold of water flow/level at which the incentive will be triggered (at the Q95, which is not exceeded on only 5% of occasions). We are convinced that this is too narrow a conception, and is one that risks failing to realise the potential of the AIM. For example it risks spill over effects from Band 3 into Band 2 and 1 sites that are also at risk.

WWF-UK believes that an alternative approach is possible to realise the broader potential of the AIM and ensure it make an important contribution to a number of water resource objectives through:

- Broadening the Scope to include Bands 1 and 2
- Introducing tiered signals for abstraction from groundwater sources, and from surface water sources that are highly dependent on groundwater contributions
- Developing a single national incentive level (a shadow price of abstraction), with weightings for tiers to translate the base shadow price into lower shadow prices for abstraction at higher tiers.
- Introducing a cap to limit risk to customers in the context of uncertain information and limited total funds available for the incentive.

Our full proposals are set out in our response to the Ofwat's consultation on the proposed price setting methodology for PR14.

We understand that Ofwat's main concern with regard to the proposals is the level of complexity. We have made several suggestions in our response to question 9 below and as detailed in Annex 1 to significantly reduce the complexity in comparison to Ofwat's current proposals, which in requiring data for all sites on recent deficits against target environmental flows is considerably more complicated than it needs to be, in our opinion. We favour a simpler alternative approach to setting the threshold level – using the historic flow level, rather than an individually generated deficit against an Environmental Flow Indicator (EFI) for each site. WWF-UK feels that this would lead to a massive reduction in complexity, with only a fractional loss of targeting.

#### **PR14 and the Restoring Sustainable Abstraction (RSA) programme.**

We understood that following omission from Ofwat's proposed price setting methodology for PR14, the Business Planning Guidance would provide direction as to whether the RSA programme is to be directly funded through PR14. We are therefore extremely disappointed and concerned to see that this direction has not been included in the Business Planning Guidance. We believe that bringing the RSA process into PR14 will provide the most cost effective solution to address the legacy of unsustainable abstraction. Water Companies that WWF-UK has spoken to are overwhelmingly supportive of addressing unsustainable abstractions through price limits, subject to cost benefit analysis, as this will remove a significant current source of uncertainty in water resource planning. There remains a significant legacy of over-abstracted and over-licensed catchments, whose situation will not be improved by increased trading. In the absence of an effective AIM, legacy abstraction issues may be exacerbated.

We look forward to discussing these issues in more detail as part of the on-going positive working relationship between WWF-UK and Ofwat.

## Response to question 9

*Q9 We aim to collect data on a consistent basis from all companies. Are the data tables clear and well specified? Are there any areas where we need to look again at the way we have asked for data to remove any ambiguities in the request?*

We have focussed our response on Section W7 outlining the proposed incentive and data for the Abstraction Incentive Mechanism.

### Use of the Environmental Flow Indicator (EFI) to set the AIM threshold.

Section W7 identifies that the current proposal is to set the baseline AIM threshold as a percentage of the Environmental Flow Indicator (EFI). This approach would require the EFI target flow for each qualifying site and the deficit of actual flows (after abstraction) against that EFI target flow to be determined for a baseline period and for a future period with the AIM incentive in play.

WWF-UK feels that the use of deficits against the EFI target flow as the performance measure introduces significant and unnecessary complexity. This could be avoided with the use of readily available gauged flows (Q) which would only result in a limited decrease in the accuracy of the targeting.

The approach proposed by WWF-UK makes reference to EFI categories (bands) rather than specific EFI flows at individual sites. These categories are used to sort abstraction points into three categories (Bands 1, 2 and 3) of relative vulnerability to damage from abstraction at low flows. A site falling into (EFI) Band 3 is more at risk than one that falls into Band 2. Gauged flows (or water levels Q) are then used to calculate AIM shadow prices when flows/levels fall below a defined flow threshold, for example the Q95.

### Trigger threshold for the AIM

In assessing the appropriate incentive level for the AIM, WWF-UK have reconsidered the appropriate river flow (or level, or groundwater level) at which the incentive should operate. The current Ofwat proposal is for the incentive to be triggered when flows or levels fall below the Q95. This would target only the most extreme low-flow situations<sup>1</sup>, and means that the incentive would apply only very occasionally (only 5% of the time, on average); and in many cases (especially in groundwater-fed systems) when the situation is already environmentally irredeemable.

The purpose of the AIM is to signal increased environmental risk as low flow spells develop, rather than to respond to extreme situations. We believe that the latter cases are best dealt with through regulatory mechanisms. We therefore believe that the level at which the incentive

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<sup>1</sup> Only 5% of the total, by definition.

should be triggered should be set at the Q70.<sup>2</sup> In the context of the 'cap' proposed, this would not increase the exposure to costs of customers, but would broaden the range of situations to which the AIM would apply. In the context of an AIM targeted already at the most 'at risk' sites, there is a likelihood of environmental risk from levels below the Q70. A trigger for the AIM set out the Q95 may overly limit the extent of opportunities under which companies would be able to benefit from the AIM.

#### Use of a single threshold.

The current proposal is to use a single flow threshold to trigger the AIM. The purpose of the AIM is to signal increased environmental risk as low flow spells develop, rather than to respond to extreme situations. Using tiered thresholds would provide an earlier signal of risk and therefore catalyse earlier action

The challenge in introducing tiers under the approach currently proposed is that it would require the calculation of deficits against the naturalised flows (QN) and it's associated EFI for each of the tiers. In contrast the approach proposed by WWF-UK uses readily available gauged flows (Q). The extra work involved in computing AIM prices for different flow tiers would therefore be negligible.

#### Application to Band 3 sites only

The currently proposal is to target the AIM at Band 3 sites only, however Band 3 sites are not the only ones at risk from abstraction. WWF-UK feels that a narrowly defined AIM risks increasing abstraction in Band 1 and Band 2 sites. A limited focus on Band 3 sites also means that the AIM will be focused on precisely the same sites as the RSA programme.

WWF-UK recommend that's the AIM mechanism be broadened to include sites in Bands 1 to 3, to reflect the likelihood of risk at all these sites at times of low flows, and to mitigate against the risk of spill-over effects. We understand that Ofwat are concerned with the potential number of sites that could fall under the AIM with a broadening to include Band 1 to 3 sites. Once filtered appropriately the number of eligible sites would be much smaller than the total. WWF- UK are concerned that restriction to Band 3 risks the number of potential sites being so limited as to severely restrict the application of the AIM by Water Companies

Consideration should be given to allowing companies to nominate sites which they believe to be of particular environmental risk but not covered by bands 1 -3, for example chalk stream headwaters or some surface water abstractions at times of very low flow. 'Opt outs' (where companies believe there is no risk from abstraction in bands 1 – 3 sites) may not be required, as the AIM places no obligation or penalty on companies electing not to alter existing operations.<sup>3</sup>

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<sup>2</sup> If a tiered approach to groundwater and high baseflow surface water abstractions is introduced as proposed by WWF, this would imply that the first tier of incentives in these cases would operate from a higher threshold, at, for example, the Q50.

\* There may be a need to consider a process of opt-outs for particular cases where it is clear that no environmental risk is associated with the abstraction, in order to remove the risk of perverse incentives (for example, abstraction from entirely degraded catchments).

## Calibration of the AIM using National Willingness to Pay data

WWF- UK has undertaken a piece of work, in partnership with key experts in the field<sup>4</sup> to explore the options for setting the incentive level for the AIM. Through this we have identified that there are considerable difficulties in converting Willingness to Pay data into an incentive level expressed in terms of mega litres. These include:

- The fact that Willingness to Pay surveys do not ask questions in the format required;
- The fact that the relationship between volume of abstraction reduction and environmental improvement is complex;
- The fact that the relationship between volume of abstraction and changes to flow is site specific, depending for example on factors such as total flow volumes in a river. By way of illustration, 1 Ml per day of reduced abstraction would make a significant difference to low flows on a small headwater stream, but would have limited impact at the bottom of a major river system;
- The fact that the reduced abstraction at a given point in a river system benefits the river downstream, not just locally, whereas improvements to say the hydromorphology of a reach can have much more spatially restricted benefits.

On the basis of these uncertainties, WWF-UK does not believe that a meaningful value for willingness to pay per Ml of reduced abstraction can currently be derived from customer surveys. Our work has therefore not used National Willingness to Pay data directly, however we have sought to ensure that the overall levels of financial reward available under the AIM incentive are within the bounds of available evidence on customer willingness to pay.

Data does exist from multiple sources over the level of incentive likely to incentivise companies to respond, albeit that this will vary considerably between companies. In work undertaken for the design of the AIM, the marginal cost faced by different companies to deploy alternative sources was estimated for four different company situations at £0, £20, £22, and £64 per megalitre.<sup>5</sup> It should be noted that these values are full substitution costs, and that lower values that defray some if not all of the marginal costs involved in switching to a more environmentally sensitive abstraction regime could be sufficient to provide an incentive to companies modify their existing abstraction policy in line with their broader objectives.

WWF-UK's study concludes that the 'base' incentive level for reductions in abstraction under the AIM should be set at £40/Ml. This level should be sufficient to incentivise action and to yield information. Weighting factors would be applied to this base value (shadow price) for different risk categories.

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<sup>4</sup> Colin Fenn (CFOnstream), Ian Dickie (EFTEC), and Scott Reid (ICS Consulting)

<sup>5</sup> CF Onstream, September 2012, Report to Ofwat on Application Testing of a Prototype Design of the Abstraction Incentive Mechanism (AIM).

We also propose that:

- A cap be introduced to limit total financial benefits to companies, and liabilities to customers and that this should be set at a level that would limit customer risk to £1 / property / year.
- An asymmetric approach to pricing should be considered, with a greater level of penalty for increased abstraction against baseline abstraction than the level of incentive for improved performance in reduced abstraction against the baseline. The 'base' penalty level for increases in abstraction under the AIM should be set at £80/MI. Weighting factors would be applied to this for different risk categories.

A series of additional recommendations emerged from the study:

- Recommendation 1: A single national incentive level should be set, rather than different rates for different companies. Differences in scale between companies would be reflected through the cap.
- Recommendation 2: An asymmetric approach to pricing should be considered, with a greater level of penalty for increased abstraction against baseline abstraction than the level of incentive for improved performance in reduced abstraction against the baseline.
- Recommendation 3: A mechanism for ex-post adjustment be designed to reduce risks of double rewards for companies (to prevent AIM rewards 'piggy-backing' on funding provided for supply-demand headroom improvement or under the RSA programme).
- Recommendation 4: Introduce an AIM suspension, for extreme drought.
- Recommendation 5: The level at which the AIM incentive should be triggered should be set at the Q70 (with consideration given to an additional tier at Q50 in groundwater systems).

More detail on the key findings of the study is provided in the Annex

**WWF-UK, 23<sup>rd</sup> May 2013**

## **Annex 1 - Setting an incentive level for the AIM**

This note has been prepared to provide an input into options for the level of the incentive for Ofwat's proposed Abstraction Incentive Mechanism (AIM). It has been drafted by WWF-UK, with advice from Colin Fenn (CFOnstream), Ian Dickie (EFTEC), and Scott Reid (ICS Consulting).

This note is intended as a discussion note to stimulate discussion around key aspects of the design of the AIM, rather than a clear set of WWF policy recommendations. WWF have set out in our response to Ofwat's consultation on future price limits the changes that we do believe to be essential if the AIM is to meet its potential, in particular a broadening of the AIM beyond 'band 3' sites, and the inclusion of more than one tier of incentives, in particular for groundwater and high base flow index abstraction sites.

### **Summary**

This note sets out a proposed incentive level for the AIM. It makes the following proposals and recommendations:

#### Proposals

- AIM proposal 1: The 'base' incentive level for reductions in abstraction under the AIM should be set at £40/MI. Weighting factors would be applied to this base value (shadow price) for different risk categories.
- AIM proposal 2: The cap on the incentive available to companies should be set at a level that would limit customer risk to £1 / property / year.
- AIM proposal 3: The 'base' penalty level for increases in abstraction under the AIM should be set at £80/MI. Weighting factors would be applied to this for different risk categories.

#### Recommendations

- Recommendation 1: A single national incentive level should be set, rather than different rates for different companies. Differences in scale between companies would be reflected through the cap.
- Recommendation 2: Introduce a cap at company level on total financial benefits to companies, and liabilities to customers.
- Recommendation 3: Err on the side of a higher incentive level in order that it actually takes effect and therefore reveals information, with risk to customers mitigated through the cap.



- Recommendation 4: Reduce the risks of either windfall gains or the failure of the AIM threshold to apply too infrequently by introducing two tiers of incentive.
- Recommendation 4: An asymmetric approach to pricing should be considered, with a greater level of penalty for increased abstraction against baseline abstraction than the level of incentive for improved performance in reduced abstraction against the baseline.
- Recommendation 6: Introduce an AIM suspension, for extreme drought.
- Recommendation 7: The level at which the AIM incentive should be triggered should be set at the Q70 (with consideration given to an additional tier at Q50 in groundwater systems).
- Recommendation 8: Consideration should be given to allow companies to 'opt-in' sites which they believe to be of particular environmental sensitivity and at risk of over-abstraction, but not covered by the AIM (for example the headwaters of chalkstreams).

### Objectives of the aim

The AIM is intended to provide incentives for water companies to take account of the environmental impacts of water abstraction in meeting their water supply obligations. Proposing a level for the AIM incentive requires clarity over the purpose and desired outcomes from the AIM, as part of Ofwat's overall regulatory incentive package.

In considering options for the incentive level, we have had regard to the following overall purpose for the AIM:

- **To internalise in company decision-making some of the hitherto external costs of water abstraction.** Companies currently face no price signals of the external impacts of their water abstraction. This represents a particularly notable market failure at times and places of water scarcity, when abstraction can have significant negative external impacts. The current regulatory and pricing mechanism provides no signals to companies of the significantly differing external costs of alternate sources of water.
- **To encourage companies to think strategically about responding to water scarcity.** Companies have a range of demand, supply and network optimisation options for meeting the water demands of their customers. The AIM would encourage companies to develop innovative approaches to meeting demands that reflect times and places of scarcity. It enables companies to do what they can to minimise the adverse effects of abstraction where and when they can, without compromising their ability to provide security of supply to customers, both (a) within existing licence permissions and (resource and demand option) capabilities; and (b) under future licensing, resources base and demand landscapes.
- On the basis of these overall objectives, we identify the following desired outcomes from a well-designed AIM.

- **Offsetting increased incentives for trading from sensitive sites.** The regulatory framework proposed by Ofwat for PR14 includes stronger incentives for companies to trade water. In the context of the historic water licensing regime, this risks creating incentives for companies to increase abstraction from environmentally sensitive sources at times of scarcity. Offsetting stronger trading incentives has been identified by Ofwat as the primary purpose of the AIM. We agree that this is an important output of the AIM; but there are others, too.
- **Securing low-cost environmental improvement.** The AIM would provide incentives for companies to reduce abstraction from sensitive sites at times of pressure, where low-cost options exist for them to do so, without compromising security of supply or necessitating costly case-by-case assessment by regulators and costly permanent replacement schemes being paid for by customers.
- **Revealing information.** By use of a market-based mechanism, the AIM has the potential to reveal information on innovative options that companies have for mitigating environmental impacts, and meeting the supply-demand balance at times of scarcity (for example, through network optimisation, options on trades, or interruptible supply contracts).

### Details of the AIM model

Ofwat is currently consulting on the details of the AIM mechanism. In the consultation proposals published by Ofwat, a single 'category' of abstraction would be covered by the AIM incentive, applying only to abstraction from the most over-abstracted ('band 3') sites at times of the lowest flow (at flow levels below the Q95; which by definition occur only 5% of the time, over the long term). That definition of applicability is far too restricted, in regard to both where and when it would apply.

In WWF's response to the consultation, we set out our view that this is too narrow an interpretation of the AIM. Specifically, WWF's view is that this proposal is narrowly focused only on the most extremely at risk sites; and, only incentivises action when water levels have already dropped too far, to very low levels. This approach risks displacing water abstraction to adjacent at risk sites; and, fails to trigger the early action required to preserve the resilience of sites, especially in groundwater-based catchments. The expert discussions undertaken in the context of this project have reinforced WWF's earlier recommendations in this respect.

The proposals on incentive levels set out here do not depend on a resolution of this issue. They can be applied to Ofwat's 'worst cases, worst times' model; but they can also be applied to a broadened AIM that encompasses more at-risk sites and more states of stress. We propose a 'base' incentive level that would be applied to the most at risk sites at times of most scarcity. A weighting factor could be applied to this 'base' incentive level, to reflect differing levels of risk at other times and places as required. This approach is set out in more detail in the Annex.

In considering the appropriate incentive level here, we have assumed that the basic approach to the AIM would involve rewards and/or penalties for abstraction when compared to an historic baseline; and, these rewards and/or penalties would be applied at the end of a price review period on the basis of performance over that time. We discuss aspects of each of these below.

**Design principles for the tariff structure**

In deciding on the level and structure of the incentive, we have developed a number of design principles. These are discussed below, and summarised in the table below.

**Table 1: Summary of design principles and recommendations**

<u>Design principle</u>	<u>Recommendation</u>
Sufficient simplicity	A single national incentive level should be set, rather than different rates for different companies. Differences in scale between companies would be reflected through the cap.
Limits cost risk to customers	Introduce a cap at company level on total financial benefits to companies, and liabilities to customers.
An iterative approach that yields information while minimising risks	Err on the side of a higher incentive level in order that it actually takes effect and therefore reveals information, with risk to customers mitigated through the cap.  Reduce the risks of either windfall gains or the failure of the AIM threshold to apply too infrequently by introducing two tiers of incentive.
Offsets trading incentives and reduces risks of deterioration	An asymmetric approach to pricing should be considered, with a greater level of penalty for increased abstraction against baseline abstraction than the level of incentive for improved performance in reduced abstraction against the baseline.
Accounts for weather risks	Introduce an AIM suspension, for extreme drought.
Addressing environmental risk rather than merely	The level at which the AIM incentive should be triggered should be set at the Q70 (with consideration

extreme low-flows	<p>given to an additional tier at Q50 in groundwater systems)</p> <p>Consideration should be given to allow companies to ‘opt-in’ sites which they believe to be of particular environmental sensitivity and at risk of over-abstraction, but not covered by the AIM (for example the headwaters of chalkstreams).</p>
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**Design principle #1: Sufficient simplicity**

One of the advantages of the AIM is the simplicity of the approach. In the design of all regulatory instruments, there is a tension between a more precisely calibrated incentive, and a simpler incentive. We believe that the simple approach should in general be preferred for the AIM, recognising that this means that there will on occasions be some imperfections in the incentive. This approach is justified because:

A simple AIM that signals external impacts fits with an outcomes-focused regulatory framework.

The AIM should be seen as iterative, with learning from the first cycle used to amend approaches in later price reviews.

The total incentives in contemplation under the AIM are relatively low when compared to other incentives, meaning that any distortions from the simpler approach will not have an excessive impact on bills or profits.

On this basis, we propose that a single national base incentive level should therefore be utilised. Alternatives include: assessment of incentives at a company-specific level; or, assessment of incentives with regard to the costs of particular schemes. In our view, these would add very significantly to the administrative complexity of the scheme for insufficient benefit.

We believe that a single national ‘base’ incentive could be given a weighting factor to reflect different hydrological states (as river flows or river or groundwater levels) or environmental sensitivity (see Annex A). This would create only a trivial increase in complexity.

*Recommendation 1: A single national incentive level should be used, rather than variable rates for different companies. Variations in company size would be dealt with through the cap.*

**Design principle #2: Limits cost risk to customers**

In the context of imperfect information on the costs facing companies, there is a risk of companies being able to derive very significant benefits under the AIM. A highly beneficial AIM

result for companies could also result from a run of wet years over the assessment period<sup>6</sup>. We therefore propose that the total potential cost liability for customers be capped under the AIM.

In the cases of companies with limited over-abstraction pressures, the lack of potential reduction in sensitive abstraction would act as a built-in cap.

*Recommendation 2: Introduce a cap at company level on total financial benefits to customers, and liabilities to consumers.*

### **Design principle #3: An iterative approach that yields information while minimising risks**

The AIM is an incentive mechanism explicitly designed in the context of imperfect information and information asymmetries between companies and regulators. In this context, a simple, market-based mechanism is an appropriate regulatory tool. One of the important outcomes of the AIM will therefore be the information that it reveals.

In these circumstances, an iterative and learning approach should be adopted to the design and calibration of the AIM. Lessons from company responses under the first round of the AIM (one price review period) can be used to adjust the incentive and cap levels for the next period. The introduction of a cap limits risks to customers in the context of imperfect information. This implies that the incentive levels of the AIM should err of the higher side: better to incentivise action and reveal information to allow for future design, than to under-incentivise action meaning that few responses and limited information is elicited from companies.

A second potential risk of the AIM failing to stimulate a response from companies would occur if the threshold at which the AIM is triggered is set at such low flow levels that it almost never occurs. This risk needs to be balanced against the opposite risk, namely that the AIM threshold is set at flow levels that are too high, resulting in companies utilising all their AIM allowance before key events are reached. Given information limitations and the different costs facing different companies, designing a single threshold level that balances these risks poses challenges.

An alternative approach is to introduce a 2-tier approach across all sites, not just groundwater and high BFI index sites. This would provide for an earlier, less strongly incentivised trigger that would reveal information about company options, while minimising the risk of all the AIM allowance prior to the cap being used up at this higher flow level. Introducing a 2-tier mechanism of this form would require only a fractional increase in administrative effort, and would be very significantly less complex than attempting to calibrate at a site-by-site level the appropriate threshold at which the AIM should be triggered.

*Recommendation 3: Err on the side of a higher incentive level in order that it actually takes effect and therefore reveals information, with risk to customers mitigated through the cap.*

*Recommendation 4: Reduce the risks of either windfall gains or the failure of the AIM threshold to apply too infrequently by introducing two tiers of incentive.*

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<sup>6</sup> See Design Principle #6 for details.

#### **Design principle #4: Offsets trading incentives and reduces risks of deterioration**

One of the key desired outcomes of the AIM is to offset the risk of increased incentives for trading, leading to increased abstraction from sites of environmental sensitivity that are currently not adequately protected by the historic licensing system. Whereas, as discussed below, the incentive level for the AIM will account at some level for the willingness to pay for environmental improvements, consideration needs to be given to the appropriate level of incentive to prevent deterioration. This needs to take account of the strength of the increased trading incentive. This implies that there may be a case for an asymmetric incentive, with a stronger level of incentive applying to deterioration from the baseline, than reward for improvements against the baseline.

There are further reasons in support of such an asymmetric approach. First, the Water Framework Directive includes a 'no deterioration' requirement. This implies the need for strong policy instruments to prevent a decline in water status. Second, evidence from customer willingness to pay surveys indicates a greater willingness to pay to prevent deterioration of water levels than to improve current levels.

*Recommendation 5: An asymmetric approach to pricing should be considered, with a greater level of penalty for increased abstraction against baseline abstraction than the level of incentive for improved performance in reduced abstraction against the baseline.*

#### **Design principle #5: Accounts for weather risks**

The extent to which companies are required to abstract from sensitive sites at times of low flows is in part dependent on the weather, with increased abstraction required in dry periods, and less abstraction covered by the AIM in wet periods. This creates risks of excess benefits to companies from wet periods, and risks to companies from dry periods<sup>7</sup>.

As in the case of double rewards, this consideration in no way takes away from the basic fact that the AIM signals the (variable) external costs of water abstraction to companies, and incentives them to take environmental care considerations into account in their operations. The variation in the strength of this signal in the context of weather fluctuations therefore reflects the true variation in the level of these external costs, subject to the reliability of the baseline used to gauge change in abstraction. As identified in the CEPA / UKWIR report<sup>8</sup>, assessing AIM abstraction over a 5-year price review period will allow for weather variations to even out to a significant degree.

At the same time, we believe it is desirable to limit the extent of weather related risks. The cap on benefits to companies introduces a limit on customer exposure to a set of wet years (amongst other things). We believe that a similar consideration needs to be introduced for

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<sup>7</sup> Another option is to define a prior baseline abstraction policy, and to use it to gauge increase or decrease in abstraction (from qualifying sites and states) compared to the AIM-modified abstraction policy, on a going forward basis. This would remove the need to assume sufficient hydrological similarity in historic and future 5 years periods, but would require 'existing' and 'new' policy abstraction values to be determined by companies on an on-going basis, and some verification by regulators. On simplicity grounds, we have adopted the historic baseline approach rather than the policy baseline approach, here.

<sup>8</sup> (Ref to be added)

company liabilities under circumstances of extreme or prolonged drought, without entirely removing the important signal that the AIM would provide to companies of the external impacts of their water abstraction in periods of water stress. We therefore propose that the AIM mechanism would be suspended under conditions of extreme drought, for example a 1:50 year event. The precise trigger for the suspension of the AIM would need to be identified.

*Recommendation 6: Introduce an AIM suspension, for extreme drought.*

### **Design principle #7: Addressing environmental risk rather than extreme low-flows**

In assessing the appropriate incentive level for the AIM, we have reconsidered the appropriate river flow (or level, or groundwater level) at which the incentive should operate. The current Ofwat proposal is for the incentive to be triggered when flows or levels fall below the Q95. This would target only the most extreme low-flow situations<sup>9</sup>, and means that this situation occurs only very occasionally (only 5% of the time, on average); and in many cases (especially in groundwater-fed systems) when the situation is already environmentally irredeemable.

The purpose of the AIM is to signal increased environmental risk as low flow spells develop, rather than to respond to extreme situations. We believe that the latter cases are best dealt with through regulatory mechanisms. We therefore propose that the level at which the incentive should be triggered should be set at the Q70.<sup>10</sup> In the context of the 'cap' proposed, this would not increase the exposure to costs of customers, but would broaden the range of situations to which the AIM would apply. In the context of an AIM targeted already at the most 'at risk' sites, there is a likelihood of environmental risk from levels below the Q70.

Such an approach also accords with design principle #3, suggesting that the design of the AIM should err on the side of incentivising action to reveal information, rather than risking failing to provide sufficient incentives. A trigger for the AIM set out the Q95 may overly limit the extent of opportunities under which companies would be able to benefit from the AIM.

We also believe that there is a case to be made for permitting companies to 'opt-in' specific, sensitive sites, even where these are not covered by bands 1-3 of the AIM classification. This would be, in particular, for sites where water abundance is required to maintain ecosystem functioning, and any abstraction is likely to pose risks. This might include headwaters of chalkstreams or certain wetland systems.

*Recommendation 7: The level at which the AIM incentive should be triggered should be set at the Q70 (with consideration given to an additional tier at Q50 in groundwater-fed systems)*

*Recommendation 8: Consideration should be given to allow companies to 'opt-in' sites which they believe to be of particular environmental sensitivity and at risk of over-abstraction, but not covered by the AIM (for example the headwaters of chalkstreams).*

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<sup>9</sup> Only 5% of the total, by definition.

<sup>10</sup> If a tiered approach to groundwater and high baseflow surface water abstractions is introduced as proposed by WWF, this would imply that the first tier of incentives in these cases would operate from a higher threshold, at, for example, the Q50.

## **Additional considerations and options**

In addition to the design principles set out above, we have considered a number of other issues in relation to the AIM. In each of these cases, we do not believe that specific design issues are required in order to address these issues.

**(i) A collar.** We have considered the case for the introduction of a general ‘collar’, to limit company risk from the AIM in the same way that the ‘cap’ limits risk to customers. We believe that the case for a collar should exist only to cover those circumstances beyond the control of the company.

We do not believe that it is appropriate to limit company exposure to penalties resulting from increased water trading. The additional principle causes of increased abstraction would result either from increased demand; or, from significantly below average precipitation. We believe that the extent of increased demand will not be very large, and does not require a safeguard. Moreover, the AIM provides a well-targeted incentive for companies to manage the risk of increased demand. The case of extreme dry periods would be addressed through the mechanism to suspend the AIM under these circumstances.

**(ii) The risk of double benefits.** The basic approach to the AIM assumes that penalties or rewards would be applied on the basis of performance against an historic baseline. Here, we assume, like Ofwat, that abstraction over a defined historical period of 5 years duration is deemed to provide a sufficiently reliable baseline from which increases or decreases in abstraction driven solely by the AIM can be judged.<sup>11</sup>

Where companies are being funded through the price review process for investment that would reduce abstraction that falls under the AIM – for example, measures to increase security of supply – this creates the risk of companies also benefitting through the AIM.

We have considered a variety of responses to this issue and concluded that no specific measures should be included to offset this consideration. Attempts to address this issue would open a Pandora’s Box of complex potential adjustments that would dilute one of the main benefits of the AIM – its simplicity. Moreover, even though investment may have been approved through the price review process, this does not obviate the fact that the AIM is signalling an external impact to companies, and may still be necessary to incentive companies to use any available ‘headroom’ to reduce environmental risk. Resetting the baseline against

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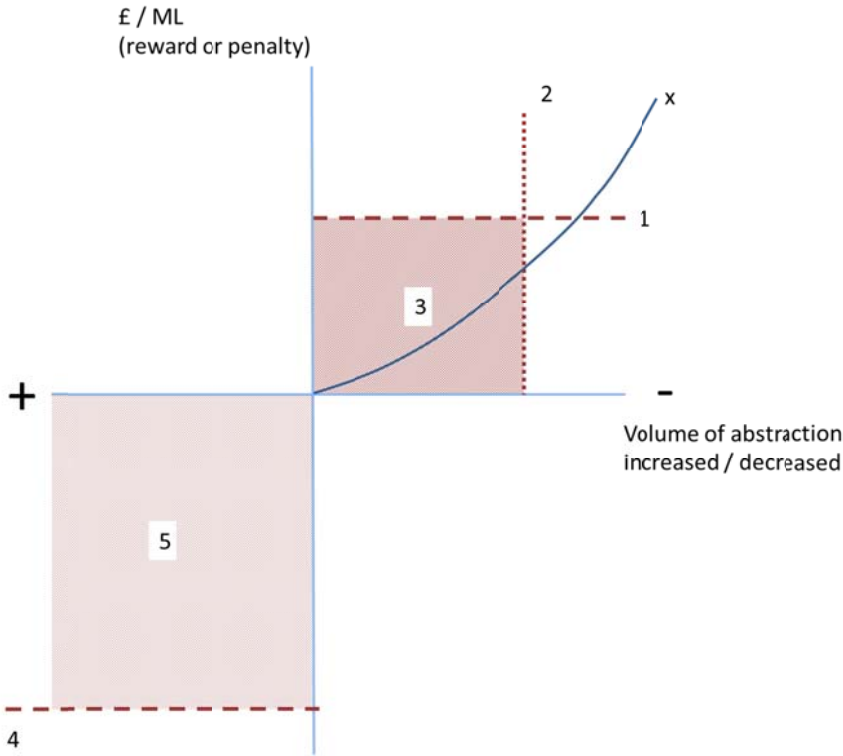
<sup>11</sup> Under a run of wet years, abstraction under signalled states and sites would be lower because flows and levels would be higher (and demands would be lower) than the average run of years in the baseline used to assess increase or decrease in abstraction. Under a run of dry years, the opposite tendencies would obtain. The use of an historic abstraction baseline to attribute variations in abstraction in the future to the AIM alone (rather than to weather variations) carries the risk false attribution, which will be minimised but not eliminated by use of a 5 year aggregation framework.



which the AIM is assessed at the end of each price review will also minimise the duration of this effect.

**Theoretical model**

In setting the values of the AIM, we will need to set the following values, as set out in the diagram below. In the diagram, x represents the hypothetical increasing marginal cost curve that companies would face in seeking to reduce abstraction from sensitive sites.



**Incentive level for reduced abstraction.** The reward in £/ML that companies would receive for each ML reduction in abstraction against the AIM baseline level.

**The cap.** The total volume of abstraction (ML) for which companies can be rewarded.

**Total potential reward** (1) x (2). The total potential financial cost to customers (£), should companies reach the cap.

**Penalty level for increased abstraction.** The penalty in £/ML that companies would pay for each ML increase in abstraction against the AIM baseline.

**Total potential penalty.** Shown as the shaded area on the illustration (£).

**Proposed values**

**The incentive level and cap**

The design principles and objectives suggest that there are two considerations in setting the incentive level:

- The level of externality associated with the abstraction
- A level of incentive sufficient to stimulate action

We have considered the first of these in the context of willingness to pay data. Willingness to pay surveys, both published and unpublished, suggest unambiguously that customers: a) have a willingness to pay for environmental improvement; b) have a willingness to pay for improved river flows; and, c) that this willingness to pay is greater to avoid deterioration than for improvements.

There are considerable difficulties in converting willingness to pay data into an incentive level expressed in terms of Ml. These include:

- Willingness to pay surveys do not ask questions in this form;
- The relationship between volume of abstraction reduction and environmental improvement is complex;
- The relationship between volume of abstraction and changes to flow is site specific, depending for example on factors such as total flow volumes in a river. By way of illustration, 1 Ml per day of reduced abstraction would make a significant difference to low flows on a small headwater stream, but would have limited impact at the bottom of a major river system;
- Reduced abstraction at a given point in a river system benefits the river downstream, not just locally, whereas improvements to say the hydromorphology of a reach can have much more spatially restricted benefits.

On the basis of these uncertainties, we do not believe that a meaningful value for willingness to pay per Ml of reduced abstraction can currently be derived from customer surveys. In broad terms, however, we have sought to ensure that the overall levels of financial reward available under the AIM incentive are within the bounds of available evidence on customer willingness to pay.

Data do exist from multiple sources over the level of incentive likely to incentivise companies to respond, albeit that this will vary considerably between companies. In work undertaken for the design of the AIM, the marginal cost faced by different companies to deploy alternative sources was estimated for four different company situations at £0, £20, £22, and £64 per megalitre.<sup>12</sup> It should be noted that these values are full substitution costs, and that lower values that defray some if not all of the marginal costs involved in switching to a more environmentally sensitive

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<sup>12</sup> CF Onstream, September 2012, Report to Ofwat on Application Testing of a Prototype Design of the Abstraction Incentive Mechanism (AIM).

abstraction regime could be sufficient to provide an incentive to companies modify their existing abstraction policy in line with their broader objectives.

In the context of the principle that the incentive level should err on the high side in order to incentivise action and to yield information, we recommend that the incentive level be set at £40/MI.

*AIM proposal 1: The 'base' incentive level for reductions in abstraction under the AIM should be set at £40/MI. Weighting factors could be applied to this to derive correspondingly reduced incentive levels (shadow prices) for other risk categories.*

The cap provides an important safeguard to prevent over-exposure to customers. Despite the theoretical attraction of basing the cap on customer willingness to pay data, the same practical considerations apply. However, using expert judgement of a range of customer studies, a cap of £1 / property / year is proposed. This cap would be aggregated over the water company area and the 5-year period of the price review.

*AIM proposal 2: The cap be set at a level that would limit customer risk to £1 / property / year.*

Expert judgement, with access to a number unpublished willingness to pay studies, has assessed each of these figures against the available published and unpublished willingness to pay data. This expert judgment has concluded that the proposed levels are broadly within the bounds of the available willingness to pay data.

### **The penalty level**

The design principles set out above suggest that the cap should be set at a sufficient level to offset the potential perverse incentives from increased trading incentives proposed by Ofwat. Assessing a precise level of these increased incentives is problematic, as the relationship between the overall trading incentive and the AIM incentive will vary from source to source, depending on the hydrological characteristics of the proposed trade. The design principle set out above suggests that a significant incentive should be incorporated to prevent deterioration. At the same time, there is significant evidence from customer surveys of a greater willingness to pay to prevent deterioration than to secure environmental improvements.

On this basis, we recommend a penalty level of £80 / MI.

*AIM proposal 3: The 'base' penalty level for increases in abstraction under the AIM should be set at £80/MI. Weighting factors would be applied to this for different risk categories.*

### **Annex: the potential use of weighting factors**

The 'base model' shown below illustrates how the AIM approach could be developed, using different weights to moderate the incentive for reduced abstraction in different categories of sites (bands 1 – 3) and at different flow levels (tiers 1 to 3). A nine cell (3 bands x 3 tiers) model is shown; but the number of cells employed can be increased or reduced. The 'shadow-price' (£/MI) for each cell in use is calculated from that of the band 3, tier 3 shadow price by

multiplying it by the relevant weight. The weights would be set to reflect the perceived benefit of reduced abstraction in each particular cell.

**The General model**

0.025	0.05	0.1	Q50
0.1	0.2	0.4	Q70
0.25	0.5	1.0	Q95
Band 1	Band 2	Band 3	

**The proposed, simplified model**

The proposed model recognises the need to keep the AIM as simple as possible, while at the same time ensuring that it realises its key benefits. Accordingly, three tiers are included for groundwater and high BFI sites alone; and, a single weighting (covering bands 1-3), is used for all other at risk sites. It would be a minimal increase in complexity to allocate different weighting factors for bands 1-3.

Groundwater and high BFI systems

0.05	Q50
1.0	Q70
Band 3	

Surface water abstractions

1.0	1.0	1.0	Q70
Band 3	Band 3	Band 3	