

**Appendix 11i:
ATKINS - Water Rights
Trading Review January
2017**

KeldaGroup

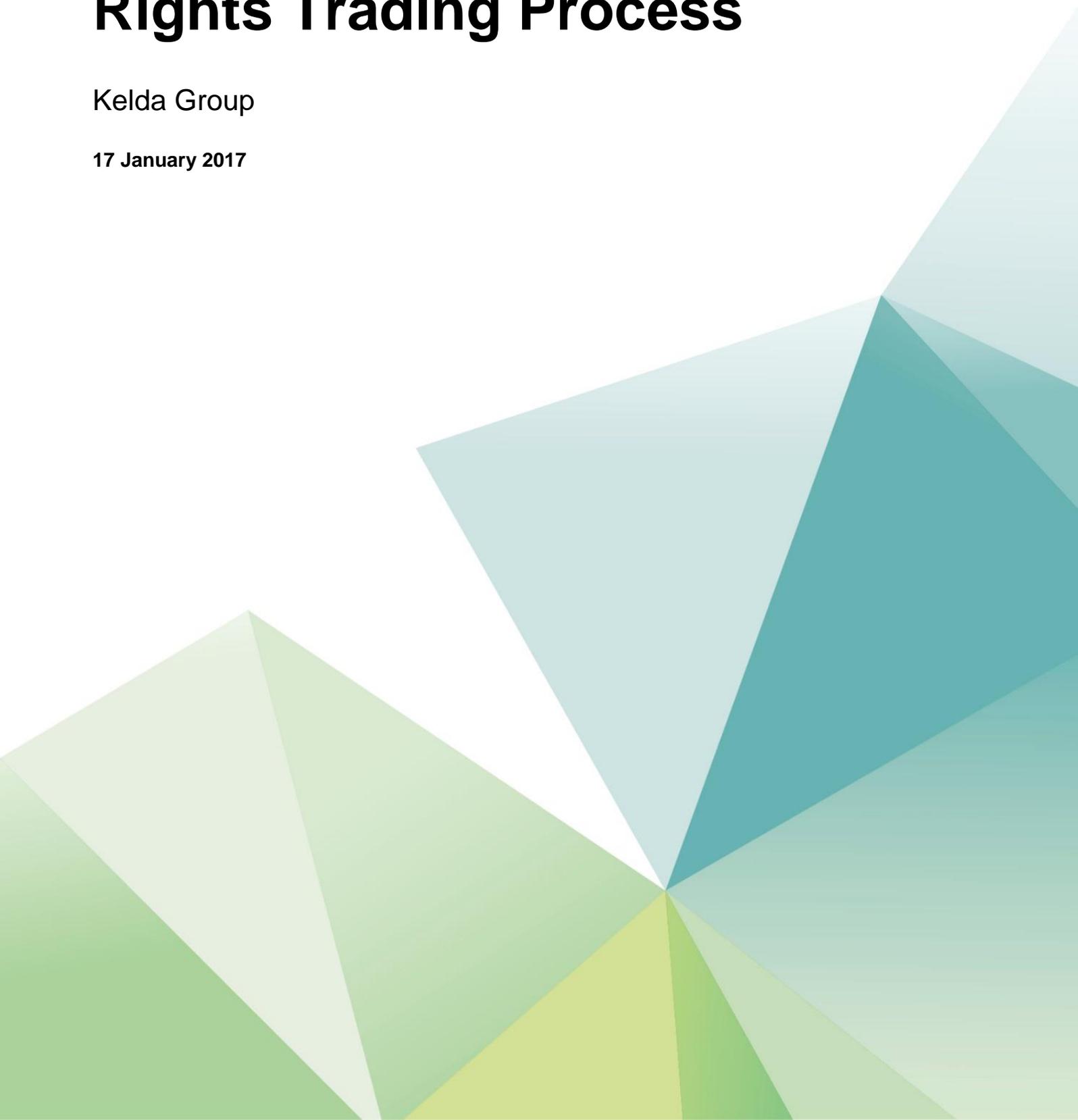


ATKINS

A Review of the Water Rights Trading Process

Kelda Group

17 January 2017



Notice

This document and its contents have been prepared and are intended solely for Kelda Group's information and use in relation to the Water Rights Trading project – an extension of Atkin's Water Sector Scoping project.

Atkins Ltd assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

This document has 42 pages including the cover.

Document history

Job number: 20160938			Document ref: 20160938-1			
Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev 1.0	Draft for comment	MS	MW	JS	-	04/11/16
Rev 2.0	Final draft for comment	MS	MW	JS	BP	14/11/16
Rev 3.0	Final – including updated EA data	MS	MW	JS	BP	17/01/17

Table of contents

Chapter	Pages
Executive summary	5
1. Introduction	6
1.1. Abstraction licencing	6
1.2. Water rights trading	6
1.3. Benefits of trading	7
1.4. What is the Environment Agency's role in water rights trading	8
1.5. Types of trade	9
2. Assessing availability of water for abstraction	10
2.1. Background	10
2.2. Water availability and trading assessments	16
3. Constraints	17
3.1. Clawback - returning water to the environment	17
3.2. Time limits	19
3.3. Licence conditions	19
4. Complicating factors and constraints	20
5. Applying for a water rights trade	21
5.1. Forms and fees	21
6. Case studies	23
6.1. England and Wales	23
6.2. International experience	27
7. Other mechanisms to encourage sustainable abstraction	29
7.1. Abstraction Incentive Mechanism	29
7.2. Restoring Sustainable Abstraction	30
8. Abstraction reform	30
8.1. Background	30
8.2. Broad proposal	31
8.3. Next steps	32
8.4. Possible future improvements to the trading system	33
9. Summary	34
References	35
Appendix A. Technical note on Abstraction licence restrictions	36
Appendix B. Water Rights Trading Pre application form WR48	37
Appendix C. Environment Agency letter to water companies - Achieving sustainable abstraction	38
Appendix D. Investigating Yorkshire Water's opportunities for water rights trading	39
Appendix E. Environment Agency data on historic water rights trades	40

Tables

Table 1-1	Environment Agency's role in water rights trading	8
Table 2-1	Overview of the Programmes of Measures in the Humber River Basin District	11
Table 2-2	Water availability and trading	16
Table 3-1	Environment Agency approach to recovering water for the environment	17
Table 6-1	Characterisation of water rights trades between 2004 and 2007	24
Table 7-1	A comparison of the Abstraction Incentive Mechanism and Water Rights Trading	29

Figures

Figure 2-1	Humber River Basin District	12
Figure 2-2	Yorkshire Catchment Abstraction Management Areas	14
Figure 2-3	Water resource availability across Yorkshire at very low flows (Q95)	15
Figure 3-1	Clawback on a whole trade in a CAMS area with no water available for licencing	18
Figure 5-1	Forms and fees by type of trade	22
Figure 6-1	Annual quantities of water rights traded in ML	23
Figure 6-2	Abstraction uses across Yorkshire study area	25
Figure 6-3	Water rights trades from 2003 to 2011	26
Figure 8-1	Plan for achieving sustainable abstractions	32

Executive summary

This report critically reviews the process for, and uptake of, water rights trading in England and Wales. It does this by discussing pertinent information from the Environment Agency's guidance on trading water rights and assessing, in an international context, data provided by the Environment Agency that reveals the extent of water rights trading in England and Wales over time.

This report finds that water rights trading could provide benefits for the environment, the regulator and traders but that despite this few water rights trades are undertaken in England and Wales; on average just 7 per year were completed between 2003 and 2011. A number of constraints have been identified that could be deterring water users from trading their rights and possible future improvements to the trading system are set out that could address these.

The acceptability of a trade to the Environment Agency is found to be dependent on a number of factors - these include: the location of the seller and buyer, the water source, the current and proposed usage, any environmental receptors and the licence type being traded. It can take three to four months for a trade to be approved, during this time fees will be incurred and professional services may be needed, for example to plan and undertake surveys.

Fundamentally, the report highlights that the current framework for water rights trading is complex, with those that partake not being incentivised by the regulator and being uncertain at the outset what, if any, modifications will be made to their proposed trade. Traders also risk having the quantity of the water rights traded being reduced by environmental clawback as well as having new conditions or time limits imposed.

1. Introduction

This Chapter introduces the abstraction licencing system and summarises and discusses pertinent information from the Environment Agency's guidance on trading water rights. This guidance can primarily be found on the Water Management Sections of the .gov website (Environment Agency, 2016a) and in the report 'A Guide to Water Rights Trading' (Environment Agency, 2014).

1.1. Abstraction licencing

Abstraction is the removal of that water, permanently or temporarily, from rivers, lakes, canals, reservoirs or from underground strata (aquifers).

Traditionally water has been treated as a 'commons' good like air or fisheries in international waters. However, this breaks down when there is excess demand for the resource, as is well known from the literature on the 'tragedy of the commons'. For water supply this issue arises when there is insufficient water to meet both human demand and to sustain the environment. At this point the regime becomes 'first-come first-served' - in the absence of scarcity both new and existing users can gain access to water to meet their demands by applying for a right, however, when supplies become scarce this may no longer be possible. The Environment Agency therefore have to actively regulate abstraction to ensure it is fair, sustainable and does not damage the environment. They do this using a licensing system that enables them to control how much water is abstracted, where it is taken from and when it is taken. This system was introduced by the Water Resources Act 1963 and has been refined and changed as a result of the Water Resources Act 1991 and the Water Act 2003.

An abstraction licence gives the holder a right to take a certain quantity of water from a source of supply (inland water such as rivers or streams or an underground source). It also guarantees that no one who applies for an abstraction licence can take a share of water already allocated to existing licences. Importantly an abstraction licence does not guarantee the quality of the water or that the amount authorised for abstraction will always be available.

1.2. Water rights trading

Water rights trading, also referred to as abstraction licence trading, is where an individual or organisation makes all or part of their abstraction licence rights permanently or temporarily available to another individual or organisation. This means trading the rights to abstract water that are part of an abstraction licence, NOT the actual licence (with its accompanying conditions if any) or physical volumes of water. The term 'abstraction licence trading' can therefore be misleading and accordingly in the remainder of this report it will be referred to as 'water rights trading' or more simply as 'trading', which in this report is exclusive of bulk water trades, e.g. between water companies.

It enables a valuable resource to be reallocated to user(s) that value it most. It has been introduced in England and Wales because in places the demand for water (including water for the environment) exceeds the available supply. Where there is significant excess demand, some form of rationing is required. In principle, that can be done either by quantity rationing or by pricing, for example, in a market framework or by some combination of quantity and price regulation. Trading is one such type of these tools, it combines quantity and price regulation. Experience has shown that price signals can be used to handle water scarcity for most periods unless and until severe drought conditions arise which require quantity controls to allocate between essential uses.

It should be noted that a water rights trade often involves a change in the abstraction location and may also involve a change in water use.

The Environment Agency approves water rights trades by revoking an existing licence and granting a new licence or by varying an existing licence.

1.3. Benefits of trading

Many existing abstraction licences are unused or underused, even in dry years. Returns data submitted to the Environment Agency from abstractors suggests that on average approximately 40% of licenced quantities are actually abstracted. Given this trading presents several positive opportunities:

1. It enables unused licensed abstraction to be transferred to abstractors who will use it;
2. It enables high value users (both long standing and new users) to gain access water;
3. It encourages low value users to release part or all of their allocation(s);
4. It is adaptable – for example temporary trades could be set up in advance and used as drought management tools by water companies;
5. It reveals the true value of water – leading to more accurate allocation and efficient use;
6. It accounts for changes in user's valuation of water over time;
7. It protects existing users and so encourages long term management and investment;
8. It is transparent (the Environment Agency advertises trades that may impact other users);
9. There is scope to enhance the financial viability of reservoirs and water conservation measures. Where abstractors (e.g. water companies) have scope to abstract from different sources, trading could be used to release water to other users in the more stressed catchment; and
10. It leads to a greater appreciation of the resource and a greater activation of existing water rights. Noting that a reduction in 'sleeper licences' could have negative short term impacts.

1.4. What is the Environment Agency’s role in water rights trading

Table 1-1 identifies what the Environment Agency’s role is in a water rights trade.

Table 1-1 Environment Agency’s role in water rights trading

What the Environment Agency will and will not provide assistance with	
	
<ul style="list-style-type: none"> • Provide information about abstractions and water availability * 	<ul style="list-style-type: none"> • Act as a broker for either buyers or sellers – identifying opportunities for licence trades
<ul style="list-style-type: none"> • Explain the Environment Agency’s approach to licensing 	<ul style="list-style-type: none"> • Facilitate or preside over negotiations on trading prices
<ul style="list-style-type: none"> • Advise before an application whether proposed trading is likely to be licensed – or how it could be modified to improve the proposal. For example, explaining likely constraints on abstraction at the buyer’s location. 	
<ul style="list-style-type: none"> • Review trading applications and feedback on those that are unsuccessful 	
<ul style="list-style-type: none"> • License successful trading applications that do not lead to further environmental damage beyond that already occurring 	
<ul style="list-style-type: none"> • Provide details of how much water is abstracted (after checking with the licence holder, providing this information is not commercially sensitive). NB this data is not free of charge. 	

**Longer term it is understood that the Environment Agency has plans to develop an electronic public register holding all abstraction information considered vital for enabling trading to progress.*

1.5. Types of trade

There are 6 different trading scenarios, these are summarised in Box 1 below. There is currently no application fee for any of these – though it is understood this is under review for temporary trades.

BOX 1 – Trading scenarios

- Abstraction location stays the same: *
 - **a transfer** is where all the licence is transferred to the buyer; and
 - **an apportionment** is where part of the licence is retained by the seller or the abstraction right is sold to several buyers.
- Abstraction location changes: **
 - **whole, permanent** – the whole of the trader’s abstraction right is transferred to the recipient on a permanent basis. The Environment Agency grants a new or varied licence to the buyer and revoke the seller’s licence;
 - **whole, temporary** – the whole of the trader’s abstraction right is transferred to the recipient on a temporary basis. The Environment Agency grants a new or varied licence to the buyer, and varies the seller’s licence with a condition preventing the seller from using their licence for the duration of the trade. The seller gets back all of their abstraction right at the end of the trade;
 - **part, permanent** – part of the trader’s abstraction right is transferred to the recipient on a permanent basis. The Environment Agency grants a new or varied licence to the buyer, and reduces the quantities on the seller’s licence; and
 - **part, temporary** – part of the trader’s abstraction right is transferred to the recipient on a temporary basis. The seller gets back all of their abstraction right at the end of the trade. The Environment Agency grants a new or varied licence to the buyer, and reduces the quantities on the seller’s licence for the duration of the trade.

* For example a buyer gains access to water by acquiring an interest in land where there is an abstraction by obtaining a right of access or occupation. Transfers or apportionments are relatively straight forward compared to trades where the abstraction location changes. Consequently the Environment Agency aims to deal with them in 10 working days. If a change in use is required this must be applied for after the transfer or apportionment.

**Unlike a transfer or apportionment the buyer can apply to change the use of the abstracted water as part of their trading application.

2. Assessing availability of water for abstraction

2.1. Background

The Environment Agency's approach to licensing water rights trades depends heavily on the water resource availability where the buyer and seller are located.

The availability of water resources for abstraction is assessed through the Environment Agency's Resource Assessment Methodology. This determines how much water is reliably available for abstraction on a catchment by catchment basis. Since not all abstractors use the full quantity of water they are entitled to, flows in recent years may be significantly different to what would be expected if some or all abstractors took their full licensed quantities. To account for this the Environment Agency's method assesses the availability of water by the relationship between the fully licensed and recent actual flows and compares this to an Environmental Flow Indicator (EFI) which assesses whether river flows are sufficient to support a healthy ecology.

By taking into account the amount of water already licensed for abstraction and how much water the environment needs, the Environment Agency determines how much water is potentially available for further abstraction. This method is an integral part of River Basin Management Planning (see Section 2.1.1), and the Abstraction Licensing Strategies the Environment Agency publish (known as Catchment Abstraction Management Strategies or, CAMS Reports) (see Section 2.1.2).

2.1.1. River Basin District River Basin Management Plans

The Environment Agency produces River Basin Management Plans for each of the 7 River Basin Districts (RBDs) in England. These plans set out the actions, known as the 'Programme of Measures', that are necessary to ensure that inland and coastal waters achieve 'good ecological status' or 'good ecological potential' (as defined by the Water Framework Directive [WFD]), or an alternative objective, and that there is no deterioration from their current status.

Abstraction licensing is one of several mechanisms in place to support River Basin Planning objectives. Other mechanisms include those to control diffuse and point source pollution, and to manage physical alterations to watercourses.

The second River Basin Management Plans were published in 2016. For the Yorkshire Water service area it is the Humber River Basin District River Basin Management that is of relevance. This is shown on the map in Figure 2-1. The full plan can be found at the link below and a summary of the programmes of measures it sets out is presented in Table 2-1.

The Humber River Basin District River Basin Management can be found online at:

<https://www.gov.uk/government/publications/humber-river-basin-district-river-basin-management-plan>

Table 2-1 Overview of the Programmes of Measures in the Humber River Basin District

Objective	Measure
To prevent deterioration	<p>Programme of Measures to control the significant water management issues. These ongoing measures play a significant role in preventing deterioration.</p> <p>The measures protect all the current uses of the water environment and the benefits that society gets from it.</p> <p>The ongoing measures represent substantial investment and all sectors with an interest in the water environment have a role to play.</p> <p>These measures apply across the River Basin District.</p>
To achieve outcomes by 2021	<p>The main programmes have discrete funding streams to deal with particular issues. These programmes will achieve the biggest improvements in the water environment by 2021.</p> <p>They include the measures predicted to improve specific water bodies by 2021 and additional measures where it has not been possible to predict the geographic extent and/or size of environmental change they will result in by 2021.</p> <p>These measures apply in either specific locations or across the River Basin District.</p> <hr/> <p>Local measures (identified by catchment partnerships).</p> <p>Each catchment partnership has identified the measures they will implement by 2021.</p> <p>Some of the measures are reflected in water body specific outcomes by 2021.</p> <p>These measures apply within specific catchments.</p> <p>Catchment partnerships also identify what more they could achieve if additional resources could be realised in future.</p>
To achieve outcomes beyond 2021	<p>A summary of the additional measures needed to achieve objectives beyond 2021. These will be reviewed when the plans are next updated in 2021.</p> <p>These measures are not linked to predicted outcomes for 2021.</p>
To achieve protected area objectives	<p>Action plans have been created to meet protected area objectives in specific locations.</p>

Source: Part 1: Humber river basin district River basin management plan - Water for life and livelihoods, 2015, Section 3.1 - Programme of measures, www.gov.uk/government/uploads/system/uploads/attachment_data/file/500465/Humber_RBD_Part_1_river_basin_management_plan.pdf

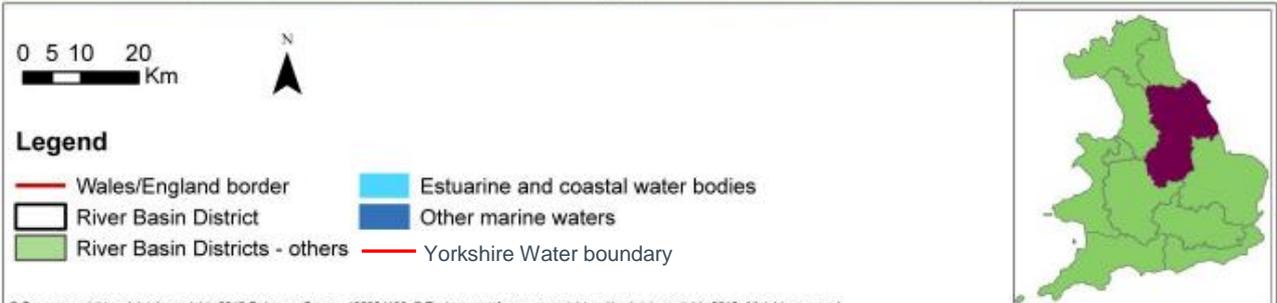


Figure 2-1 Humber River Basin District

2.1.2. Catchment Abstraction Management Strategies

Catchment Abstraction Management Strategies (CAMS) set out how the Environment Agency manage water resources in specific areas. The strategies consider the volumes licensed and the volumes actually abstracted. These quantities are then compared against estimates of the volumes available for abstraction to determine the abstraction status of each catchment: water available; no water available; over licensed; or over abstracted. In Yorkshire there are 7 CAMS areas, these are mapped on Figure 2-2 and listed below:

- Aire and Calder abstraction licensing strategy;
- Esk and Coast abstraction licensing strategy;
- Hull and East Riding abstraction licensing strategy;
- Derwent abstraction licensing strategy;
- Don and Rother abstraction licensing strategy;
- Swale, Ure, Nidd and Upper Ouse abstraction licensing strategy; and
- Wharfe and Lower Ouse abstraction licensing strategy.

Figure 2-3 shows a compilation of CAMS data across the Yorkshire Water service area with a 25km buffer. The figure reveals that 6,273 square kilometres of the study area (26%) do not have surface water available for licensing under Q95 flows (a further 36% of the area has restricted water available at this time). A Q95 flow is the flow which is equalled or exceeded for 95% of the flow record, it is therefore a significantly low flow. Gradually as the flows increase towards Q30 (a higher flow that is exceeded only 30% of the time), more water is available and can be licensed without risking ecological damage. At Q30 there are high flows, such as when there has been a lot of rainfall. However it is noteworthy that some licences only allow abstraction at high flows, so in some areas there may actually be less water available when flows are high.

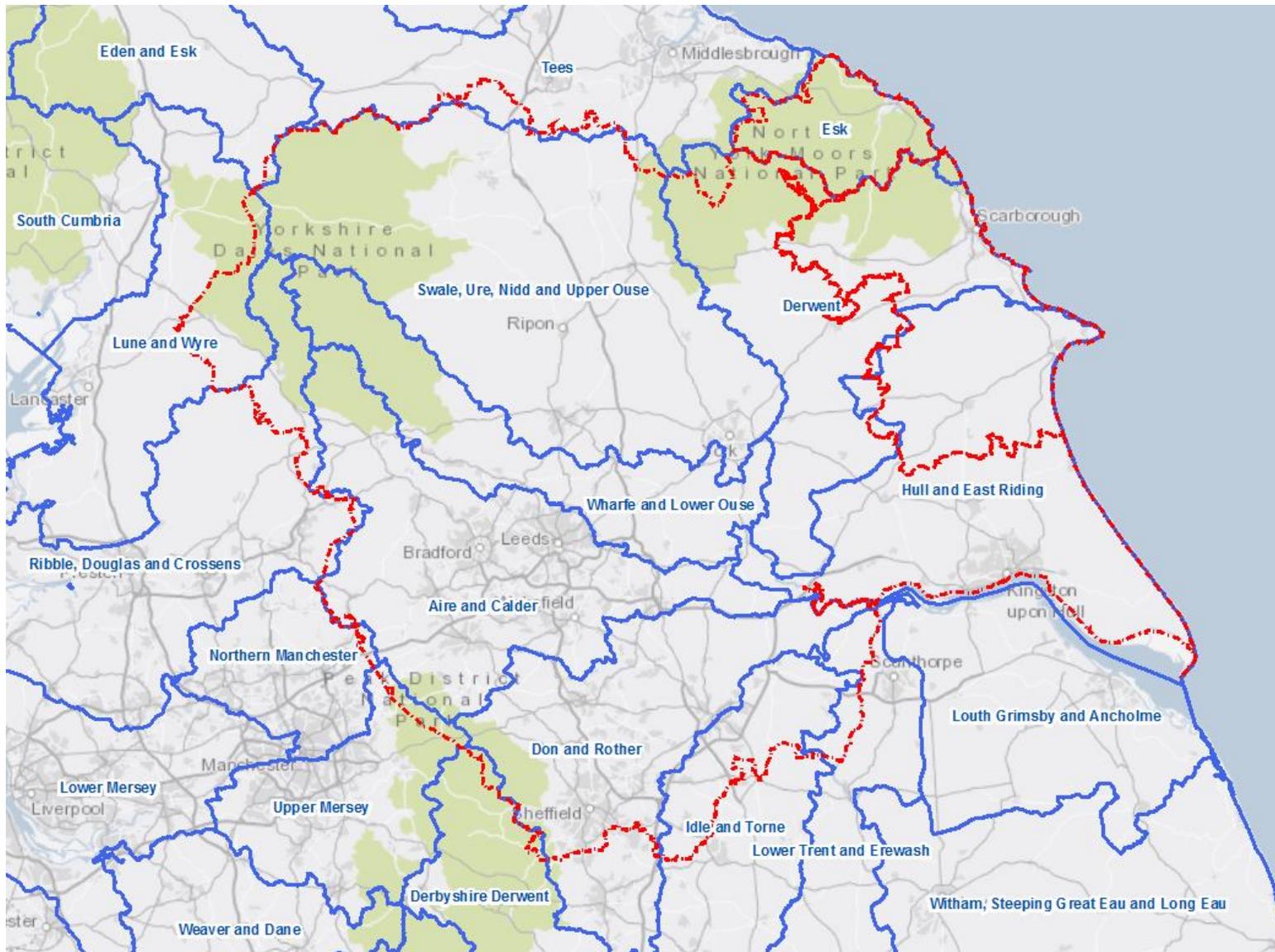


Figure 2-2 Yorkshire Catchment Abstraction Management Areas

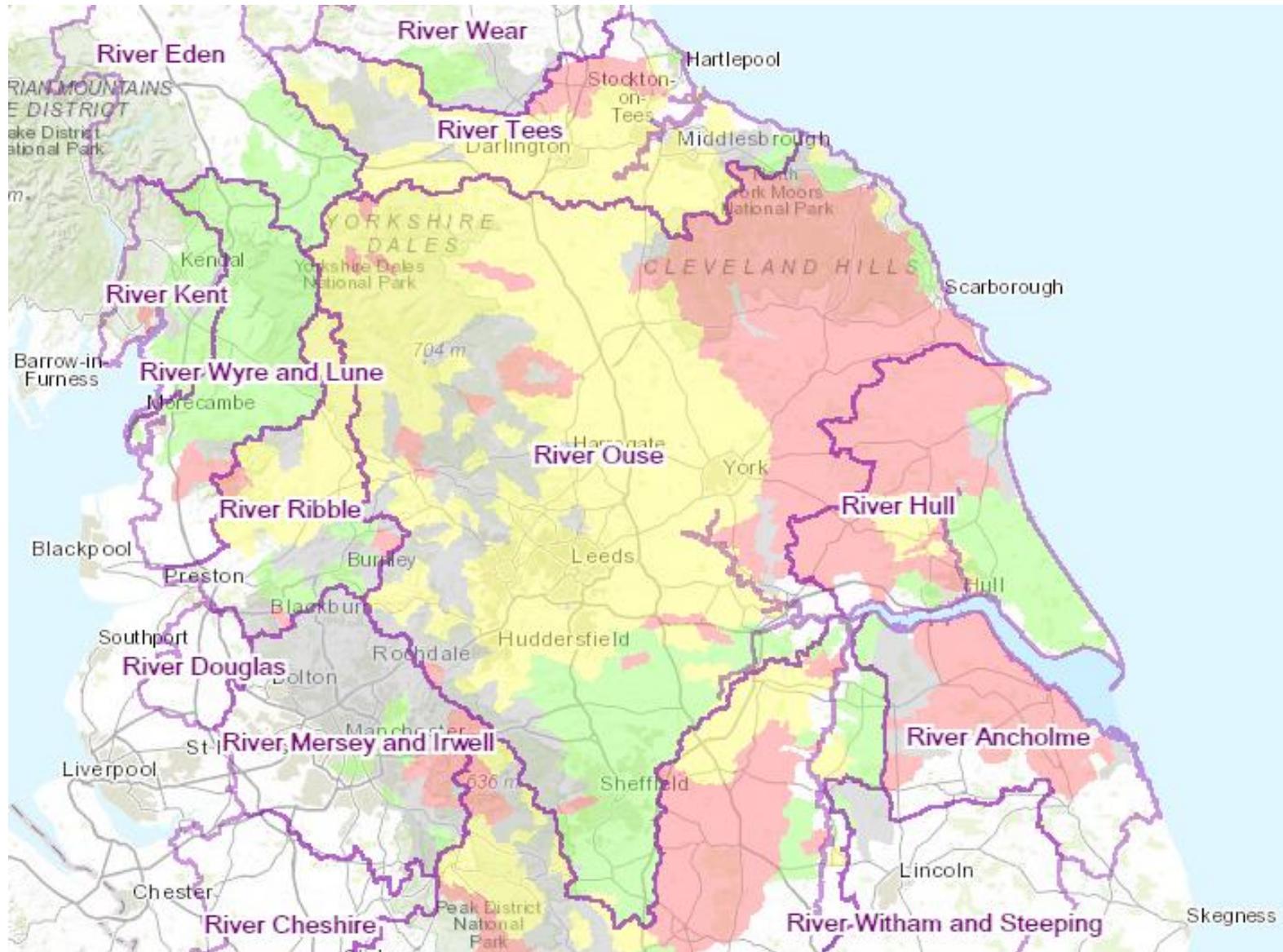


Figure 2-3 Water resource availability across Yorkshire at very low flows (Q95)

(shown against regional catchments, purple line)

2.2. Water availability and trading assessments

Table 2-2 sets out the Environment Agency’s approach to licensing water rights trades with regard to water resource availability defined by the appropriate CAMS for where the buyer and seller are located.

Table 2-2 Water availability and trading

CAMS water availability	Trading viability
Water available for licensing	Trading acceptable of used* and unused water**
Restricted water available for licensing - Current abstraction is sustainable, but if existing licences were fully-used they would cause unacceptable environmental impact at low flows. Water may be available at high flows with appropriate constraints.	Trades of used* and unused** water up to the point where levels of actual abstraction reach sustainable limits are allowed. Once this limit is reached, then only trades of used* water will be allowed.
Water not available for licensing - Existing abstraction is causing unacceptable environmental impact at low flows (restricted water may be available at high flows).	Only trades of used* water are allowed.

***Used water** – is licenced water that has been abstracted (returns)

****Unused water** – licenced water that has not been abstracted (commonly referred to as ‘paper water’ – this may be unrequired or for many users it provides contingency for times when they have higher demands)

Source: table created from information provided in ‘A Guide to Water Rights Trading - Report GEH00711BTZK-E-E (Environment Agency, 2014)

When applying the logic set out in Table 2-2 it should be noted that the **water resource availability of a downstream water body will always take priority over an upstream one**, because water taken out upstream affects the flow downstream.

This means that whilst an upstream water body may have water available for licensing (green) if downstream parts of the system had no water available (red) then a trade of unused water would not be allowed in the upstream waterbody because of the impact it would have downstream.

3. Constraints

3.1. Clawback - returning water to the environment

As part of its statutory duty to protect the environment the Environment Agency may, as part of a water rights trade, seek to recover or 'clawback' what is perceived to be unused water from a licence to benefit the environment (**used water will not be clawed back**). This means that after a trade there may be less water licensed for abstraction as the Environment Agency may amend the licensed quantities on the new or modified permit(s).

3.1.1. Method for determining clawback

Table 3-1 outlines the Environment Agency's method for determining clawback quantities.

Table 3-1 Environment Agency approach to recovering water for the environment

CAMS water availability	Environment Agency approach to clawback
Water available for licensing	There is no clawback
Restricted water available for licensing - Current abstraction is sustainable, but if existing licences were fully-used they would cause unacceptable environmental impact at low flows. Water may be available at high flows with appropriate constraints.	There is no clawback until actual abstraction reaches sustainable limits. Then unused water will be recovered for the environment.
Water not available for licensing - Existing abstraction is causing unacceptable environmental impact at low flows (restricted water may be available at high flows).	Unused water is recovered for the environment

Source: table created from information provided in 'A Guide to Water Rights Trading - Report GEHO0711BTZK-E-E (Environment Agency, 2014)

Figure 3-1 shows an example where the Environment Agency would clawback water to meet their statutory duties. In this example the buyer and seller are in an area that has no water available for licencing, the buyer and seller agree to trade the maximum amount of licensed water possible (a whole trade) and the seller has not been fully utilising the maximum available quantity of water on the licence. The outcome is that the buyer cannot have the whole licence as this could increase actual abstraction (if they fully utilised it) and so cause environmental damage. The seller can therefore only trade the portion of their licence that is in active use and so the buyers new licence will be for a reduced amount, with the remainder now being clawed back to supplement environmental flows.

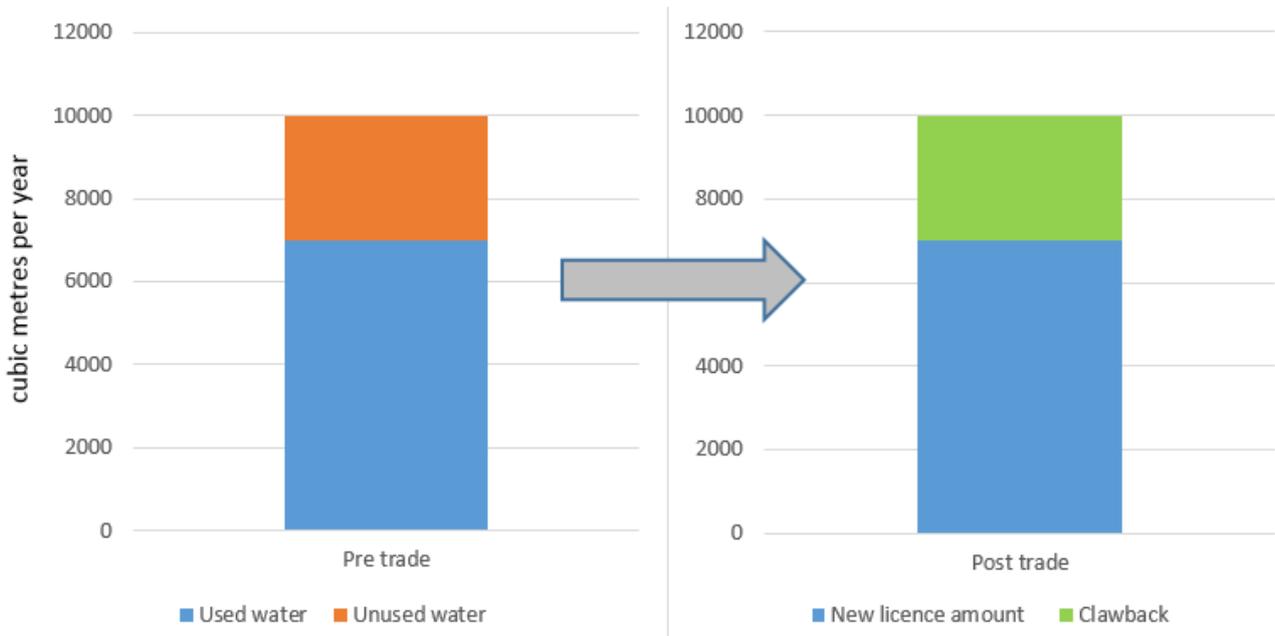


Figure 3-1 Clawback on a whole trade in a CAMS area with no water available for licencing

3.1.2. Avoiding clawback

For temporary trades unused water will only be clawed back for the period of the trade. This means the seller will get all of their licence back at the end of the trade.

If a permanent trade is preferable to the seller it may benefit them to begin the trade at the end of a hydrological year in which they have made more use of their abstraction licence than usual. This is particularly true where demand is not driven by hydrological conditions - for example, for a farmer trading an irrigation licence the Environment Agency may be less likely to clawback flows if usage was high due to farm expansion or the use of water demanding crops rather than because it had been a particularly dry year – which would imply there may be more unused water on the licence in future wetter years.

3.2. Time limits

The Environment Agency are now legally required to limit the duration of all new or varied abstraction licences. This includes those arising from a water rights trade where the seller's existing licence does not have a time limit. With regard to time limits it is noteworthy that:

- When a time limit on a temporary trade expires, the licence reverts to its original form – with no time limit applied;
- The Environment Agency may limit the duration of a temporary trade;
- No time limit is applied to licence variations that reduce the licensed quantities (EA, 2014);
- Time limits typically align to the relevant CAMS common end date, unless a date sooner is agreed. This allows for periodic review and changes to abstractions within an area where circumstances may have changed since licences were granted.

3.3. Licence conditions

A water rights trade may be subject to licence conditions similar to those imposed on full licences. These could include site-specific operating rules that require abstraction to stop or be reduced when a flow or water level falls below a specified point. These are known as hands off flows (HoF) and hands off levels (HoL) conditions (see Appendix A for further details). Typically these are imposed to ensure sufficient water continues to be available for the environment – in a given catchment these may become increasingly restrictive as more of the available water is allocated to abstraction.

Abstraction Licensing Strategies (CAMS reports, see Section 2.1.2) provide information on what conditions might apply to new licences and whether time limited licences will be replaced with the same conditions.

4. Complicating factors and constraints

In addition to water availability (see Chapter 2) there are a number of other factors that could affect the acceptability of a trade. These are summarised below:

LOCATION:

- The buyer intends to abstract from a different location;
- In general, trading downstream on water body (i.e. selling water rights to somebody who will abstract the water downstream of your location) is simpler than trading upstream (selling water rights to somebody higher up the catchment) or to a smaller tributary, where more restrictive conditions may be required;
- The buyer intends to discharge used water to a different location (with regard to non-consumptive uses; for example a water company abstracts water but a portion of this is returned to the environment at wastewater treatment works which may be far from the original abstraction);
- There are other licensed abstractions in proximity to the buyers proposed location. This would be particularly important with regard to groundwater abstractions but the Environment Agency would also look at the local impacts of the trade on impoundments;
- If the seller's abstraction quantity is linked to abstraction quantities at other locations – e.g. it has conditions or is part of a group licence;
- If a seller's abstraction is dependent on flows in a part of a river that is not hydrologically connected to the buyer's location;
- Trading can only take place where there is a hydrological (surface water) or hydrogeological (groundwater) link between the seller's abstraction point and the buyer's proposed abstraction point. This means that there must be a:
 - **Surface water connection:** The buyer's and seller's abstractions must be from the same river, between two tributaries in the same catchment, or between a tributary and the main river;
 - **Groundwater connection:** The buyer's and seller's abstractions must be from the same aquifer (e.g. in the same groundwater management unit) ; or
 - **Surface to groundwater, or groundwater to surface water connection:** Trading between surface water and groundwater may be possible in some cases (for example, between a river and adjacent river gravels).

WATER SOURCE

- Trading groundwater abstraction rights is more complex than trading surface water abstraction rights as groundwater licences are often more restrictive and flows are more difficult to monitor and model; and
- If a seller's abstraction is dependent on them transferring water into the catchment from another water source – as this transfer may not be controlled by the buyer.

USAGE

- The buyer intends to use the water for a different purpose to the seller;
- The buyer intends to use the water for the same purpose to the seller but plans to use different techniques/processes. For example if a spray irrigator sold their water right to a drip irrigator the Environment Agency would need to resolve complexities relating to the fact that drip irrigation is more efficient than spray irrigation, so less abstraction may be needed to meet crop water requirements, unless the buyers farm was larger in which case the demand for water may be the same or higher, in which case it would be significant that drip irrigation provides a lower return to the environment;
- The buyer intends to return less of their used water to the environment than the seller does currently, i.e. there is a change in consumptive volumes. For example comparing a fisheries abstraction licence, which is largely flow through water taken from the environment and then returned to it close to the point of abstraction, to an abstraction licence of a potable bottling company.
- The quantity of water traded cannot exceed that authorised by the seller's licence; and
- Many licence holders are reportedly reluctant to discuss trading with the Environment Agency because of fears that it may highlight that they have unneeded water and/or that the Agency may impose additional hands-off or other conditions on their licence.

ENVIRONMENTAL RECEPTORS

- There are nearby environmental constraints for example designated environmentally sensitive features near the buyer's proposed location. The Environment Agency will require evidence showing these will not be adversely impacted by the trade (this could potentially require surveys). A trade will not be allowed if it is deemed to bring about further environmental damage beyond what is already occurring;
- Water companies have a duty to have regard to River Basin Management Plan (RBMP) objectives when carrying out their activities; and
- Water companies must demonstrate through their Water Resources Management Plans (WRMPs) that they have solutions in place to resolve existing environmental problems caused by abstraction and also to prevent deterioration.

LICENCE TYPE

- Only full licences can be traded. That is licences with a protected right (most types of abstraction over 20 cubic metres a day). As opposed to:
 - **transfer licences** – for moving over 20 cubic metres of water a day from one source of supply to another without intervening use;
 - **temporary licences** – for abstractions over 20 cubic metres a day over a period of less than 28 days; or
 - **exemptions or unlicensed abstractions** – for example abstractions of 20 cubic metres or less a day that are part of a single operation, some land drainage operations, flood protection, filling ships or boats with drinking or ballast water, firefighting water, dewatering from quarries, mines and other building or engineering operations.

5. Applying for a water rights trade

5.1. Forms and fees

Before applying for a water rights trade the Environment Agency advises completing a pre-application form (form WR48, see Appendix A). The Environment Agency's Permitting Support Centre will then advise if the trade is acceptable in principle.

Once a proposed trade has been discussed with the Environment Agency the buyer and seller must apply for the appropriate licences (see Figure 5-1). Additionally if the proposal may impact on the environment or other water users the Environment Agency will advertise the application (at the buyer's expense). This gives people who may be affected by it the opportunity to share their concerns with the Environment Agency.

In total it can take three to four months for a trade to be approved.

Figure 5-1 shows the application fees for the various types of trade. However while these are low it should be noted that potential traders could incur substantial costs in their own time and effort, and professional fees for environmental studies, flow monitoring, legal agreements and other requirements.

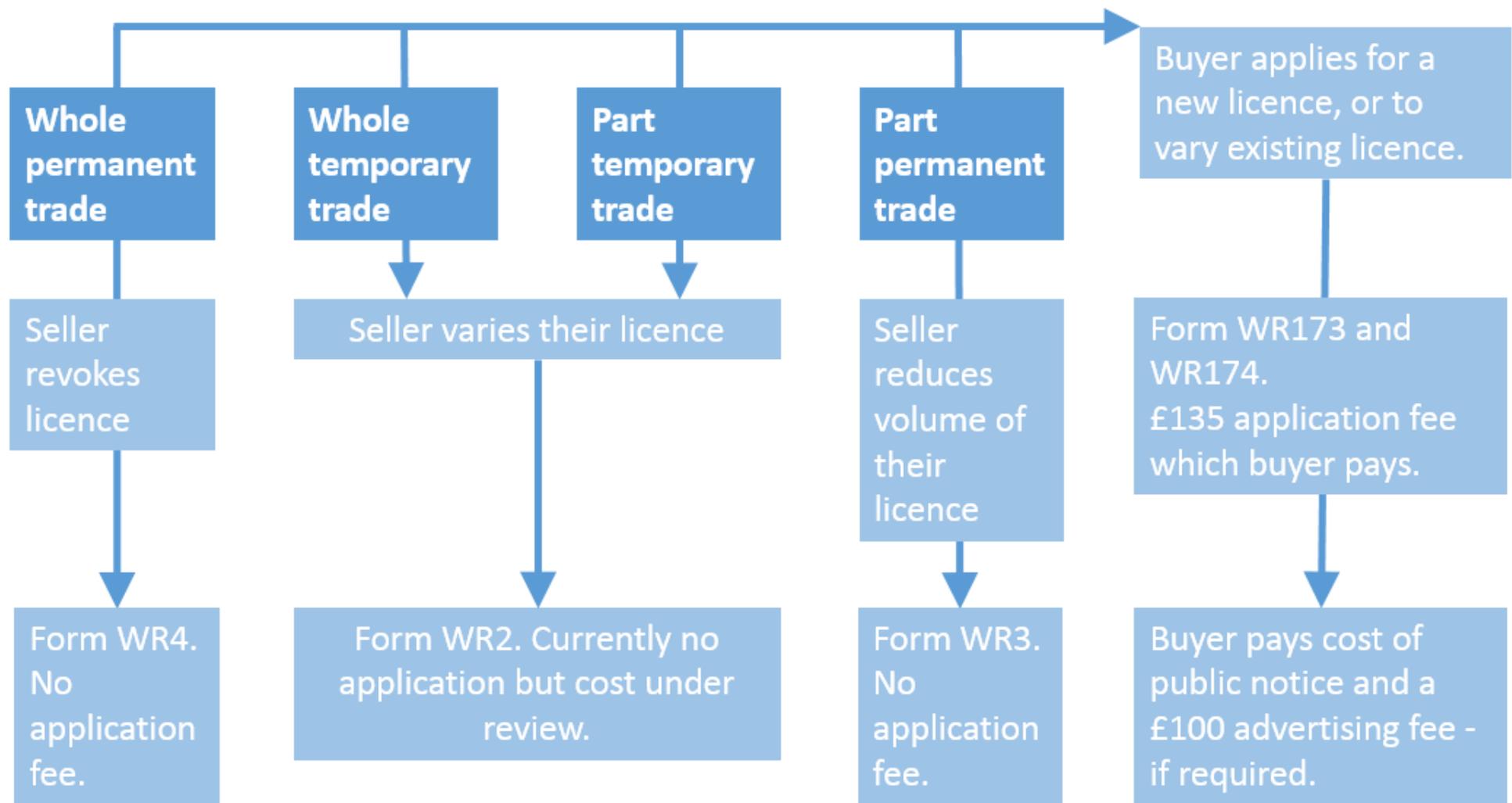


Figure 5-1 Forms and fees by type of trade

Source: figure created from information provided in 'A Guide to Water Rights Trading - Report GEHO0711BTZK-E-E (Environment Agency, 2014)

Note: The forms referenced in the above figure are available online at: <http://www.environment-agency.gov.uk/business/topics/water/32020.aspx>

6. Case studies

6.1. England and Wales

Although water rights trades have been possible, by joint application to the Environment Agency for some time there are few public examples of successful trading. In England and Wales only 53 trades were recorded from 2003 to 2011, out of some 20,000 abstraction licences. These trades represent just 0.002% of annual average abstraction in the period. For comparison, trading levels in Australia were around 1.4 per cent of water rights in 2007/08 (National Water Commission, 2010).

The lack of trading activity suggests that factors such as poor incentives for trading, an overly complex process and a lack of a pricing model have been turning potential traders away. It is, however, notable from Figure 6-1 that the number of trades have been increasing year on year with regard to the quantity of rights being sold. This is a positive sign and suggests that reforms to the trading system that address traders concerns will increase uptake further.

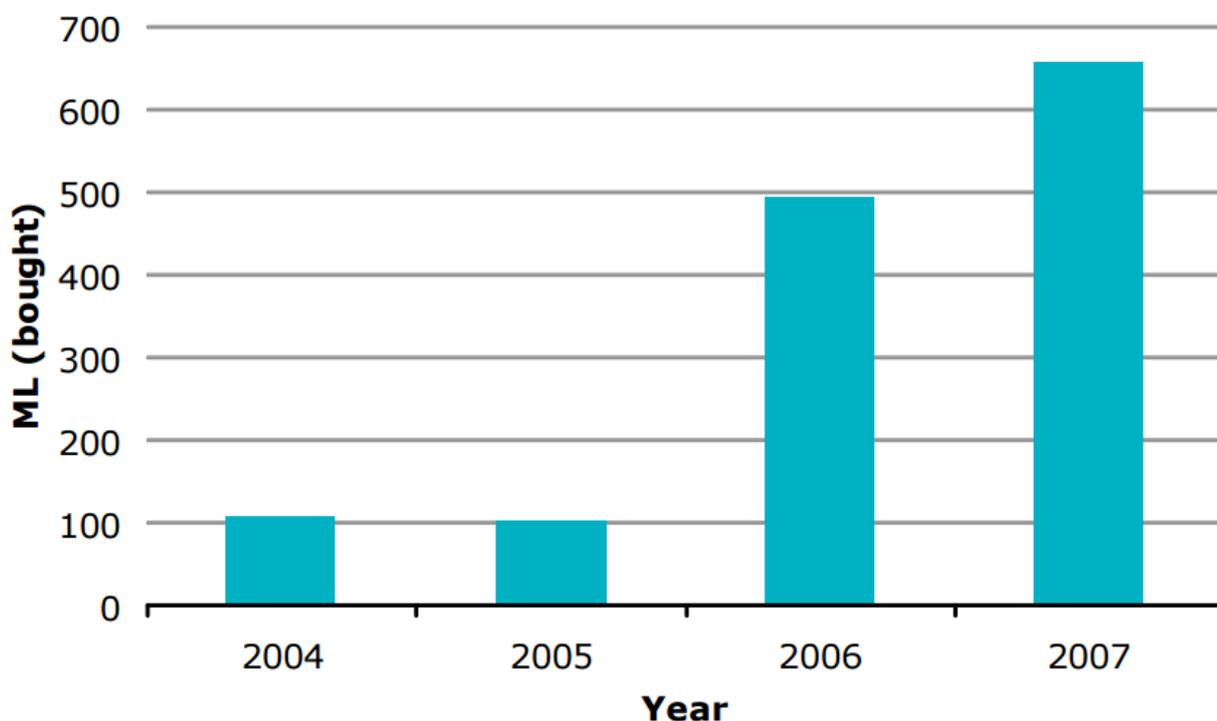


Figure 6-1 Annual quantities of water rights traded in ML

Source: Frontier Economics, 2011 - EA data on registered trades that have occurred over the period 2004–2007. Note: volumes are based on those issued to buyer's licences. Partial year data has been excluded

Note: A request for an update to the data presented in this figure has been submitted to the Environment Agency under the Freedom of Information Act. If the request is successful updates will be issued in an addendum to this report.

In spite of the low number of reported trades it is possible that there is a relatively large number of trades that are unreported. This is most likely in the agricultural sector where many growers informally trade water by renting land with water; this avoids the need to apply for temporary water abstraction rights as the land is rented with a fixed amount of irrigation included in the annual rental fee.

The importance of the agricultural industry in trading is supported by an examination of EA data on registered trades that have occurred over the period 2004–2007 (see Table 6-1). This reveals that most trades are small and occur between agricultural producers or irrigators (Frontier Economics, 2011). Further assessment of the 2004–2007 data examined in Table 6-1 shows that the majority of these trades occurred within the Anglian region which ties in with the large number of agricultural abstractions in this area. The data also shows that 53 percent involved a temporary lease of rights, although the duration of these lease agreements is unknown. Having established the importance of the agricultural sector in trades (see also Section 6-2) it is likely that trade in the Yorkshire Water service area is unlikely to be uniform with most trading likely to occur in central and eastern areas where there is a high density of agricultural abstractions, see Figure 6-2.

Table 6-1 Characterisation of water rights trades between 2004 and 2007

Characterisation of trade	Number of trades	Quantity traded (ML)	Percentage by volume
Between agriculture/irrigation traders	35	981	52%
Between a water supply company and others	3	74	4%
From one water supply company to another	2	95	5%
Misc	8	731	39%

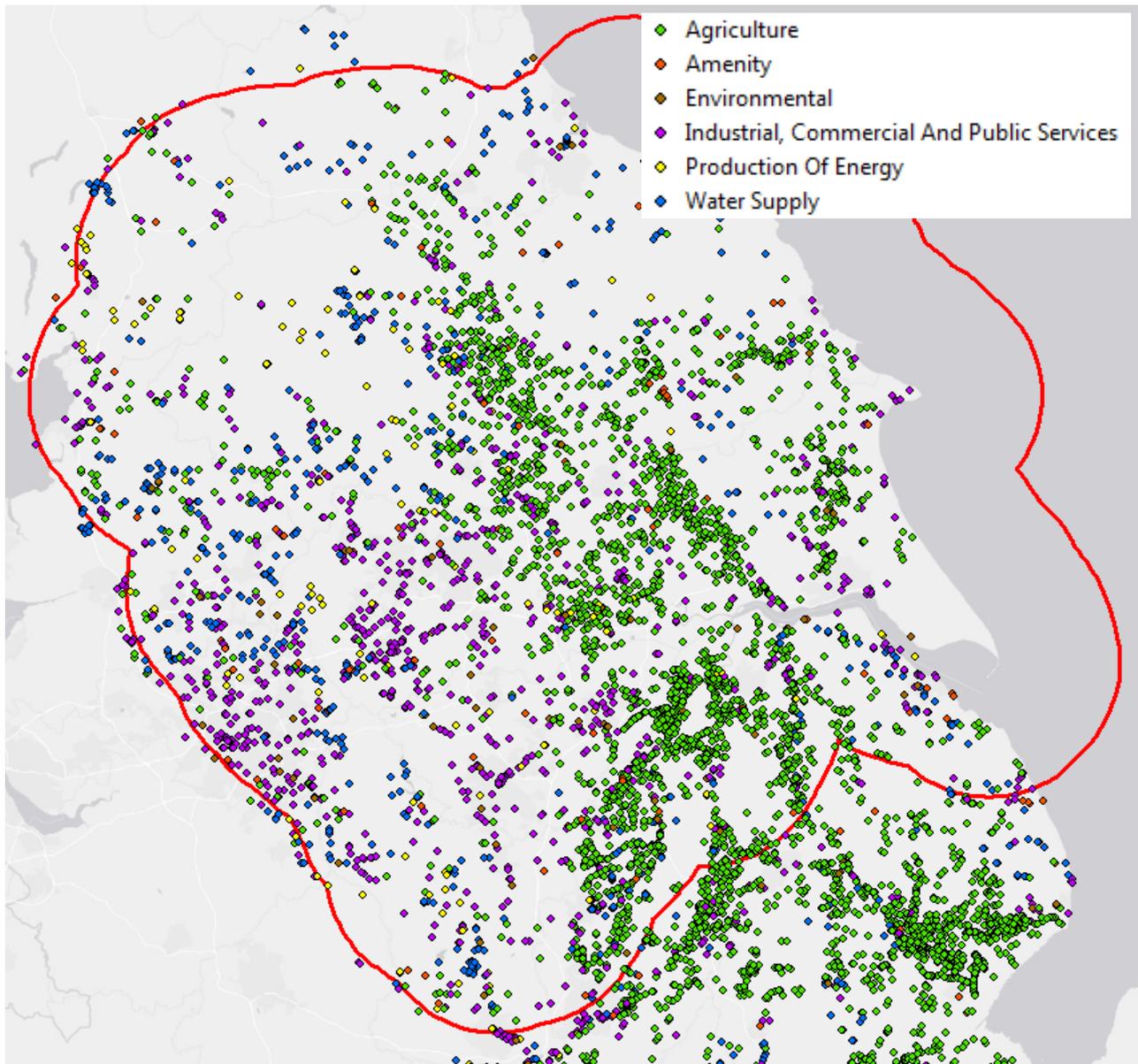
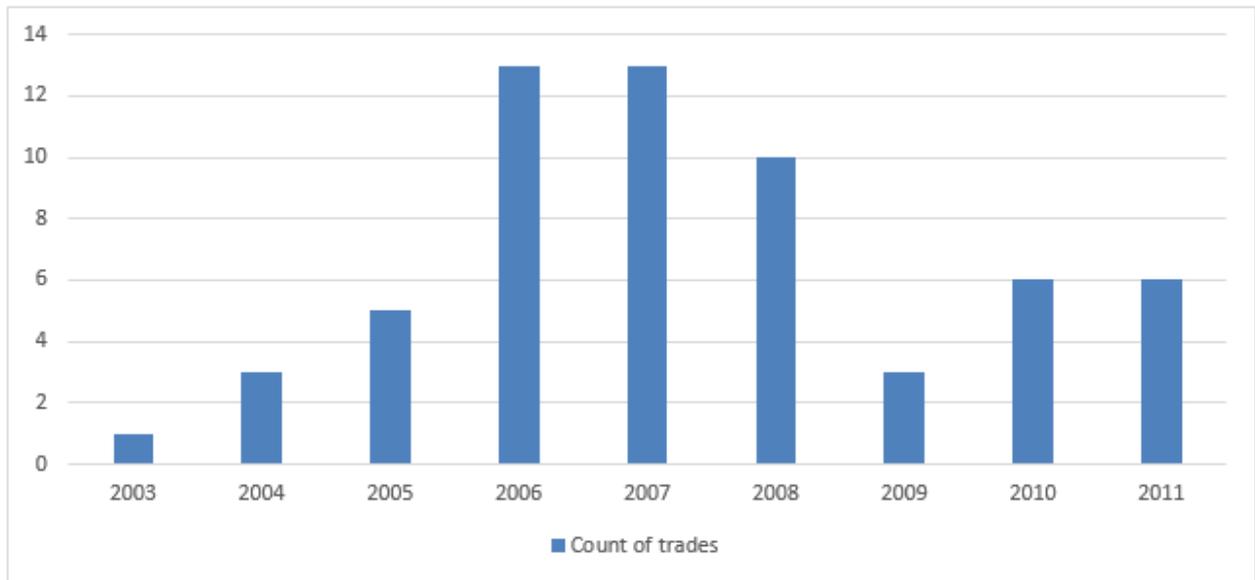


Figure 6-2 Abstraction uses across Yorkshire study area

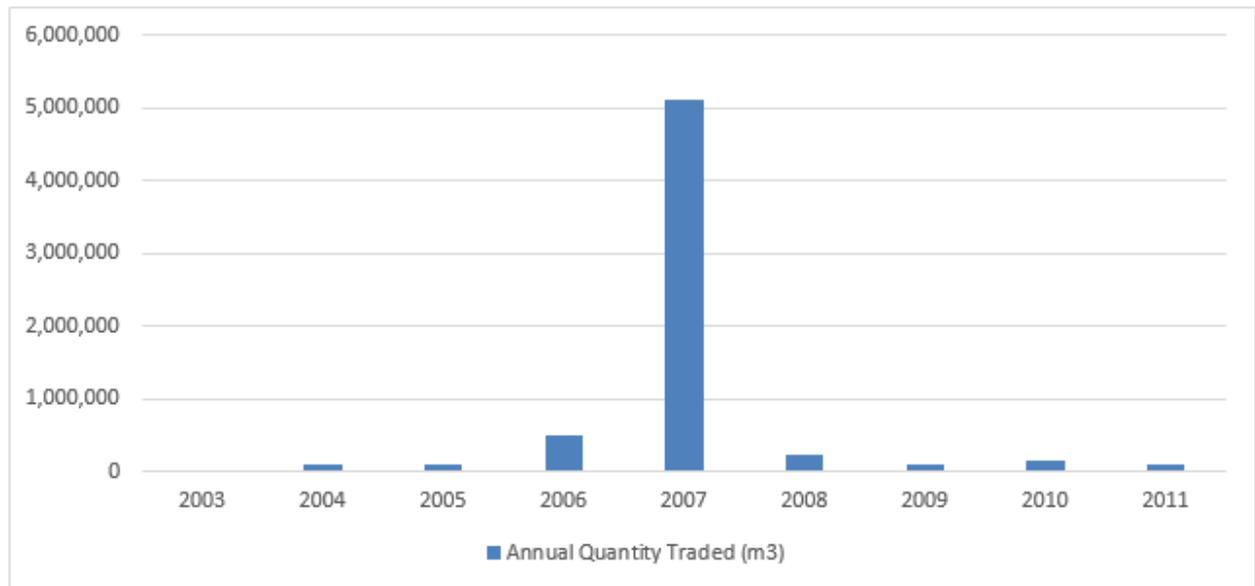
In addition to revealing the importance of agricultural traders, Table 6-1 also reveals that water supply companies have been participating, but not to the same extent as others. There is, however, international evidence that shows that water supply companies can be major players in a trading market. In the US for example the most common trades involve public water suppliers buying rights from agricultural users. Similarly, leases (temporary trades) between agricultural users and public water suppliers (in both directions) are becoming increasingly common there. For example, dry year option contracts are often used by public water suppliers, which give them the ability to exercise an option to purchase water in dry years. Often, option sellers are agricultural producers who can fallow land in the event that a water option is exercised.

In Australia, trades between public water suppliers and agricultural users or, 'rural to urban trades' as they are termed, have grown substantially in the last five years. They have enabled water suppliers to transfer upstream water availability down to their downstream abstractions (National Water Commission, 2010).

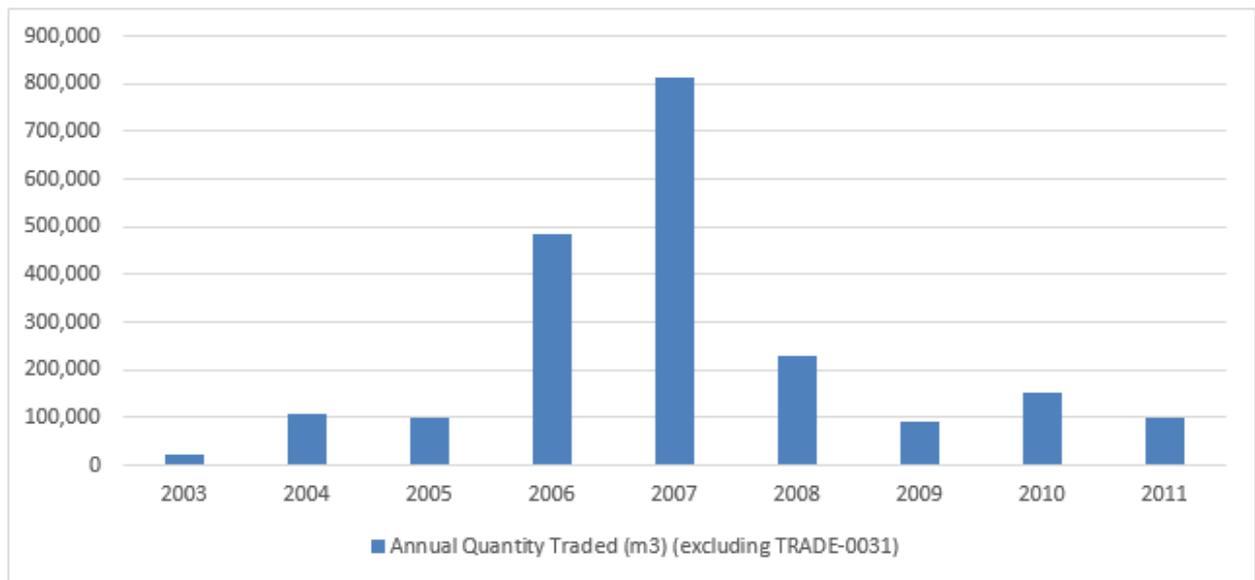
UPDATE: Figure 6-3 and Appendix E provide an update to the data presented in this Section following a request to the Environment Agency under the under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.



a)



b)



c)

Figure 6-3 Water rights trades from 2003 to 2011

Figure 6-3 a shows that although the number of water rights trades increased from 2003 to 2007 the number has reduced since 2007. This trend is reflected in the quantity of water rights traded, shown in Figure 6-3 b. One of the 13 trades in 2007 was particularly large, 4,291,424 m³. The trade (reference number 0031) was of a non-evaporative cooling process water right to a recipient that used it for potable water supply. Figure 6-3 c presents the quantity of water rights traded with trade 0031 excluded, the result shows that this single trade was significant but that even without it more water rights were traded, by volume, in 2007 than in any other year from 2003 to 2011.

6.2. International experience

Several countries already have established water markets, in particular Australia, Chile and the US. A thorough review of these and other countries trading regimes can be found in Ofwat (2010) and Frontier Economics (2011). This Section summarises some of the key learnings from international experience.

In many cases there are notable differences between international water markets and those in England and Wales, in particular the importance of agricultural users in those countries. However, there are also a number of similarities from which a number of relevant factors that impact the take-up of trading can be established:

- The extent of water scarcity. Trading becomes a more important route to secure water when resources are scarce;
- There is more trade when the characterisation of traders is heterogeneous; this encourages a wider range of water valuations which drives more trades (note this also encourages physical trades of water and investment in water systems, e.g. interconnections or development of alternative water resources);
- There is more trade where licence types are simple or at least heterogeneous – for example a dominance of seasonal licences / or licences with flow constraints may limit the development of standardised trades resulting in higher transaction costs. In the case of licences with restricted flows users may also need more investment, e.g. storage, to make best use of trading opportunities;
- Trading is most prominent where there are many agricultural users – whose valuations of water vary based on their crop and irrigation system – meaning their valuation of water can vary and differ from one another;
- Trading is most prevalent where there is a streamlined approval process and commitment to the market from Government and regulators. Australia and Chile both have public registers of trades and both the US and Australia have streamlined approvals for standard well known trade types;
- In the US and Australia temporary water trades dominate over permanent trades. In the US, temporary trade moves over 20 times the volume of permanent trades. In Australia's MDB the differential is around 5 times (Frontier Economics, 2011). This is possibly due to large variations in the value of water over time and also because temporary trades in these regulatory regimes are less complex;
- Trading levels increase over time as participants become familiar with the process. Water rights trading in Australia grew by approximately 600% from 1999 to 2008 (Australian National Water Commission).

A review of international trading experience also reveals that markets need to be closely monitored to avoid negative unintended impacts, see Box 3.

BOX 3 – Unintended impacts of trading

NEGATIVE:

Hoarding – In Chile there were fears over investors hoarding water rights. To overcome this a ‘use it or lose it’ rule was introduced.

Unemployment – Following a decline of water-dependent industries in specific regions.

Reduced runoff and water quality impacts - Following trading reforms in Australia many agricultural users increased the volume and number of farm dams they had on their properties in order to reduce their water abstractions.

Depletion of alternative resources - In the western US, agricultural users have increased their use of unregulated groundwater.

POSITIVE

Reduction in the economic impact of drought - the Australian Bureau of Agricultural and Resource Economics found trading caused structural adjustments in the agricultural industry as in responses to water shortages in 2007/08 irrigators used water trade as a means of maximising the value from limited water supplies. The main buyers of water during the 2007/08 droughts were horticulturalists while the main sellers were dairy producers, who benefited from being more flexible in their water consumption in the short term (National Water Commission, 2010).

Public water supply security - a diversification of water resource management tools for water companies.

Rationalisation - trading increases incentives for intensive water demanding industries to consider locating where supplies are more plentiful because they will be cheaper there.

7. Other mechanisms to encourage sustainable abstraction

In addition to clawback in trading (see Section 3.1) the Environment Agency has other schemes to recover water for the environment. These include River Basin Management Plans, Resource Assessment and Abstraction Licensing Strategies, the National Environment Programme and Environment Agency drought plans. Two others which are most relevant to water rights trading are the Abstraction Incentive Mechanism and Restoring Sustainable Abstraction - further details about these two schemes is provided in the following sections. It is important to understand these when considering water rights trading since they may impact trades. For example licences vulnerable to sustainability reductions, say through the ongoing Restoring Sustainable Abstraction investigations may lose value over time and so be less lucrative to trade. Conversely these risks must also be considered when acquiring water rights via a trade.

7.1. Abstraction Incentive Mechanism

The Abstraction Incentive Mechanism (AIM) is a means by which water companies can be incentivised to reduce their abstractions from environmentally sensitive water sources. It is currently a reputational incentive – meaning it harnesses a water company’s aspiration to enhance its reputation by demonstrating that it is changing its operating practices in a way that benefits the water environment. In time, possibly forming part of PR19, it may also include financial incentives such as penalties and/or rewards (for details see Ofwat, 2016).

AIM provides an incentive to water companies to abstract from less-environmentally sensitive sources (which may incur higher opex costs) when possible, but recognising that under design condition for which source deployable output (DO) is calculated AIM sources will need to be operated up to the licensed quantity to maintain the supply demand balance.

When considering water trading opportunities a water company therefore needs to also consider if their abstraction may also be suitable for AIM and how these two different options compare (Table 7-1).

Table 7-1 A comparison of the Abstraction Incentive Mechanism and Water Rights Trading

	AIM	Water rights trade
Financial	There are currently no financial incentives. When/if they are introduced they will be set by the regulator – could be lower than market rate	Market based fee
Reputational	Clearly demonstrates that company is changing its operating practices in a way that benefits the water environment. Direct comparisons to other water companies are likely to be made by Ofwat.	Positive reputational outcomes may be less visible
Environmental	Amount returned to environment is variable – potentially full licenced amount could be returned.	Only clawback, if any, is returned to the environment
Timeline	New system – potentially slower process – financial incentives not available yet.	Established process – easier to implement
Availability of opportunities	Only certain abstractions are suitable for AIM (see Ofwat, 2016). However, if successful, AIM could be applied more widely – potentially being applicable at sites where there are no trading options.	Water company must find willing buyers and/or sellers to set up a trade. Trades may therefore be difficult to arrange.

7.2. Restoring Sustainable Abstraction

Restoring Sustainable Abstraction (RSA) is an ongoing process through which abstraction licences that are considered to be unsustainable, or potentially damaging to the environment are identified. A programme of work is then implemented under the National Environment Programme (NEP) that investigates the causes, assesses options and implements measures to restore sustainable abstraction. This could include changing abstraction licences or other actions to reduce the impact on the environment. These licences are identified in the Restoring Sustainable Abstraction Programme. It is the Environment Agency's ambition to complete this by March 2020.

8. Abstraction reform

Defra has indicated that it is committed to making sure that the water sector is resilient for the long term. Increased pressure on water resources from climate change, population growth and the requirements for environmental protection mean that action is needed not only to address existing issues arising from abstraction, but also to provide the ability to manage water resources sustainably into the future. Managing water abstractions is an important part of that process. This Chapter examines some of the proposed changes that are relevant to trading. Full details of the proposed reforms are given in the Environment Agency's response to consultation on reforming the Water Abstraction Management System (Environment Agency, 2016c).

8.1. Background

The Coalition Government committed to reform of the water abstraction management system in England in the Natural Environment White Paper, published in June 2011. The proposed direction, principles and process for reform was then set out in the Water White Paper, Water for Life, (Defra, 2011).

The UK and Welsh Governments published a joint consultation, "Making the Most of Every Drop", in December 2013. The purpose of the consultation was to seek views on a range of proposals for reforming the water abstraction management system in England and in Wales. A summary of consultation responses was published in July 2014.

In January 2016 the Environment Agency published the 'UK Government response to consultation on reforming the Water Abstraction Management System (Environment Agency, 2016c). The remaining sections of this document set out the high level proposals for a new abstraction management system in England.

8.2. Broad proposal

The proposed new abstraction management system is summarised in Box 2 (Environment Agency, 2016c).

BOX 2 – Proposed abstraction reforms

- From the early 2020s replacement abstraction permits will be issued with permitted volumes that reflect current business. 'Paper water' (licensed abstraction volumes that have not been used) will be removed, subject to appeal, if they pose a risk to the environment.
- Hands-off flows and similar conditions will be standardised to simplify the system.
- At any time when flows are high, abstractors will be allowed to take water to store it. There will be no seasonal permits.
- All abstractors directly affecting surface water will have conditions on their permits that enable flow based controls to protect the environment. Those currently without flow-based controls will have new conditions on their permits.
- Abstractors will be able to trade water in a quicker and easier way in catchments where there are potential benefits. In these catchments, there will be a range of **preapproved trades**, which means permit holders can trade more easily at times when the availability of water is low. In these catchments, surface water abstractors will be given shares of the catchment's different water resources which will facilitate pre-approval of upstream trades. This will give abstractors more flexibility, helping them to cope during low flows and reveal the value of water to underpin decision making.
- No permits will be time limited, providing a fairer approach. We will take a risk based catchment approach to permit reviews and will consider all permits on a level playing field. We will publish catchment data and information so abstractors and others can understand the environmental risks in their catchment and the likelihood of a review being triggered. Catchment abstraction reviews will link to the overall management of catchments as a key natural asset working closely with local people. There will be reasonable notice given of potential permit changes to give abstractors time to adapt. There will be no compensation for permit changes.
- Currently exempt abstractions (e.g. trickle irrigators) will be brought under licensing control

8.3. Next steps

On the 30th of September 2016 the Environment Agency wrote to its regulatory contacts in water companies in England (see Appendix C). The letter sets out the Environment Agency’s vision for achieving sustainable abstraction by the early 2020’s and appended to it was a methodology (summarised in Figure 7-1), relevant data and an explanatory slide pack. In short, the letter stated that the draft WRMP19 now needs to ensure that any new or planned increases to abstraction would not cause deterioration. By February 2017 all water companies must confirm that their licences are sustainable, or set out how to manage the impacts, which will then inform the NEP released in March 2017. A holistic review of trading opportunities may form a part of that response.

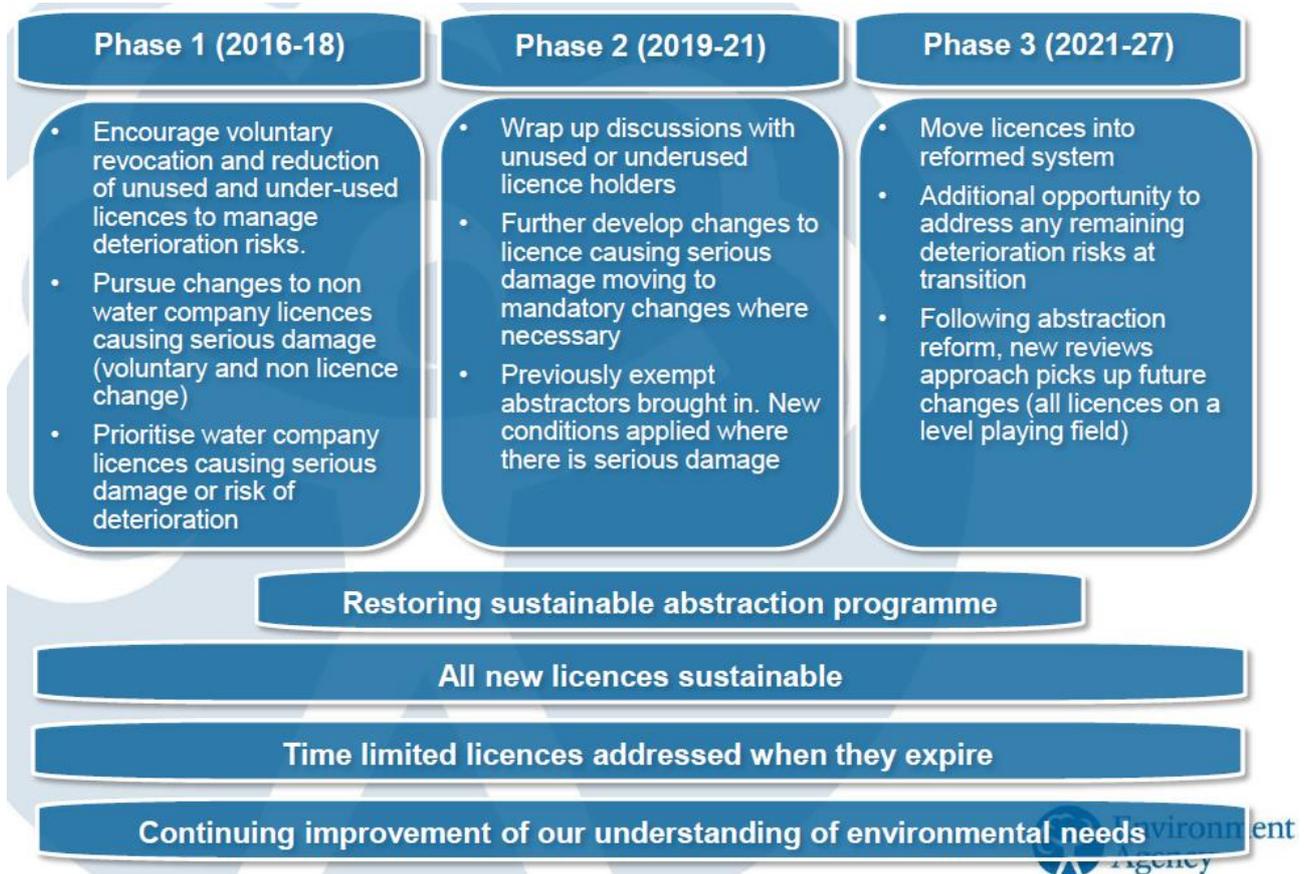


Figure 8-1 Plan for achieving sustainable abstractions

Source: Achieving sustainable abstraction - water company slide pack (Environment Agency, Sept 2016) (REF: 161003)

8.4. Possible future improvements to the trading system

Trading is a relatively new concept to water resource management in England. As such its operation is likely to develop over the coming years. It is suggested that the following changes are likely and would encourage more trading:

- **Reducing costs to traders:**
 - A standardisation of costs or development of a pricing framework that includes incentives for buyers and sellers, so that both parties have an incentive to trade and neither is penalised; and
 - A streamlined and transparent approvals process to reduce uncertainty – for example a simplified process where there is no change in abstraction location and/or where there is no change in use and consumption;
- **Increasing visibility of the market:**
 - An improvement in the availability, quality and currency of relevant data;
 - A platform for publishing buy and sell offers to allow buyers and sellers to find one another more easily; and
 - Publish pricing information of past trades.
- **Reducing risk to traders:**
 - To date the Environment Agency's approach to assessing trades has been on a case-by-case basis. This creates uncertainty which could be removed by moving toward a regime with explicit trading rules. For example trading viability could be based on categories of trade and distinct trading zones that defined who could trade with who based on their locations. A rule based regime could also define set licensed volume reductions for upstream trades and offer unchanged licensed amounts for downstream trades. A compromise between this and the current 'case by case' regime would be for the Environment Agency to provide catchment level trading guidelines since guidance is currently only available at a national scale – this could be incorporated into the CAMS process relatively easily;
 - It is noted that the Environment Agency's approach of environmental licence reductions at the point of trade was also implemented in Australia but that the approach was ultimately abandoned due to its negative impact on incentives for trade. A variation to this that may improve the system would be if the Environment Agency had the 'first rights of refusal', as is the case in Spain. This would give the Environment Agency the option of purchasing any rights put up for sale at the price listed in the proposed trade.
- **Governance:**
 - A review of the Water Resource Management Plan processes, potentially mandating water companies to show they have considered trading;
 - Review how water companies can be incentivised including a review of the regulatory treatment of any sales revenues and purchase costs. For example if Ofwat treated purchases of water rights as capex rather than opex companies might be more open to trading as it would not make it harder for them to achieve their efficiency targets;
 - Ofwat's technical paper on upstream markets (Ofwat, 2010) suggests that water companies could be required to trade a proportion of their water resources;
 - Increased certainty over the approach to abstraction reforms and the practical consequences of implementing reforms – uncertainty makes buyers less likely to purchase rights as they are not sure exactly what they are buying and users are more likely to conservatively hold onto their rights for contingency.
- **Maximising environmental benefits:**
 - It is feasible that the Environment Agency could enter the trading market itself (either buying and selling or just as a reverse auction in over abstracted catchments). This would enable them to make flows mimic natural conditions or to boost water available for the environment at critical times – rather than just setting aside a fixed minimum quantity of water. This is common in the US and is also the practice in Australia. It is noted however that In Australia this has led to accusations of conflict of interest; and
 - The Environment Agency could build its modelling capacity so that it was able to proactively encourage specific trades, or certain types of trade in selected areas.

NB - The Environment Agency and Ofwat have said (Environment Agency, 2016c) they will work with interested parties to consider whether there are any mechanisms (e.g. trading codes of practice) required to address concerns from smaller abstractors such as farmers around market dominance by larger abstractors. They have also committed to keep the impacts of markets under review to guard against unintended consequences such as impacts on food security.

9. Summary

International experience shows that water markets can be an appropriate solution for distributing scarce water resources across increasing demand. The main way they do this is by promoting more efficient water allocation; because a market based price acts as an incentive for users to allocate resources from low value activities to high value activities. In concept water markets can also provide benefits for the environment, the regulator and traders. There are, however, debates about the extent to which water markets operate efficiently in practice, what the social and environmental outcomes of water trading schemes are, and the ethics of applying economic principles to a resource such as water.

In England and Wales few water rights trades are completed compared to other countries with established markets. Although the number of trades, and the volume of water traded, increased from 2003 to 2007, suggesting a growing market, both reduced from 2007 to 2011. While the sample is small the trend may suggest that traders have tested the market and have subsequently been deterred from further engagement with it. This may be due to insufficient incentives for trading or because of the perceived complexity of the process - with proposed trades reviewed on a case by case basis. It may also be due to uncertainties regarding environmental clawback and/or having new conditions or time limits imposed on the traded licence. Increasingly there is also a possibility that potential trades are being held up as stakeholders first await to see the implications of proposed abstraction licence reforms.

In January 2016 the Environment Agency published the 'UK Government response to consultation on reforming the Water Abstraction Management System (Environment Agency, 2016c). With regard to water rights trading this will have both direct and indirect impacts:

- Permitted abstraction volumes will reflect current business usage – meaning that traders will no longer be defensive of 'paper water';
- Licence conditions will be simplified - making trades more straightforward;
- Time limited licences will be replaced with risk based permit reviews – partially removing some of the risks to traders around trading expiring permits; and
- In catchments where there are potential benefits there will be a mechanism for preapproving trades.

These changes may increase activity in the water trading market and this report finds that the reforms provide an opportunity to make additional improvements that would promote trading in England and Wales further still. In summary these would relate to reducing costs to traders, increasing visibility of the market, reducing risks to traders, improving governance and maximising environmental benefits.

References

Australian Competition and Consumer Commission, 2010, Final Advice - Water trading rules: advice development, <https://www.accc.gov.au/regulated-infrastructure/water/water-trading-rules-advice-development/final-advice>

Defra, 2011. Water for Life
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/228861/8230.pdf

Environment Agency, 2014, A Guide to Water Rights Trading - Report – GEHO0711BTZK-E-E,
<http://webarchive.nationalarchives.gov.uk/20140328084622/http://cdn.environment-agency.gov.uk/geho0711btzk-e-e.pdf>

Environment Agency, 2016a, Water management: abstract or impound water,
<https://www.gov.uk/guidance/water-management-abstract-or-impound-water>

Environment Agency, 2016b, Managing water abstraction, 2016,
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/562749/LIT_4892.pdf

Environment Agency, 2016c, UK Government response to consultation on reforming the Water Abstraction Management System
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/492411/abstraction-reform-govt-response.pdf

Ernst and Young, 2011, Changing course through water trading, https://s3-eu-west-1.amazonaws.com/media.aws.stwater.co.uk/upload/pdf/STW_Water_Trading_FINAL_9_June_2011.pdf

Frontier Economics, 2011 A report to Anglian Water - A right to water? Meeting the challenge of sustainable water allocation, <http://www.anglianwater.co.uk/assets/media/a-right-to-water-full-report.pdf>

Ofwat, 2010, Valuing Water - How upstream markets could deliver for consumers and the environment,
http://webarchive.nationalarchives.gov.uk/20150624091829/http://ofwat.gov.uk/publications/focusreports/prs_inf_value.pdf

Ofwat, 2015, Abstraction, <http://www.ofwat.gov.uk/regulated-companies/improving-regulation/abstraction/>

Ofwat, Feb 2016, Guidelines on the abstraction incentive mechanism, http://www.ofwat.gov.uk/wp-content/uploads/2016/02/gud_pro20160226aim.pdf

National Water Commission, 2010, Entitlement trading volumes: The impacts of water trading in the southern Murray–Darling Basin, Chapter 4) and estimates of the total entitlements in 2008-09, source:
http://www.nwc.gov.au/resources/documents/AWMMR08-09_S3_nat_summary.pdf

National Water Commission (2010,) 'The impacts of water trading in the southern Murray–Darling Basin An economic, social and environmental assessment'.

Stern, 2013, Water Rights and Water Trading in England and Wales , The Foundation for Law, Justice and Society, <http://www.fljs.org/sites/www.fljs.org/files/publications/Stern.pdf>

Australian government, national water commission, 2010, The impacts of water trading in the Southern Murray Darling basin – an economic social and environmental assessment'

Appendix A. Technical note on Abstraction licence restrictions

Environment Agency, Aug 2012

Abstraction licence restrictions

Hands off flow and hands off level conditions

August 2012

Applying hands off flow or level conditions to abstraction licences is how we and others manage water resources. It is a well-established way of particularly limiting or avoiding the impacts of abstraction during times of low flows. The Environment Agency and its predecessors have been applying limiting conditions to licences for all sectors for over 30 years. They enable us to make water available to abstractors whilst protecting the environment and the rights of other water users.

These restrictions come into force as river and groundwater levels fall, typically in the spring and summer months in most years. They are an accepted part of the abstraction regime. In drought conditions, we also have other powers to stop or reduce abstraction to protect the environment, for example in an emergency we can use section 57 of the Water Resources Act 1991, to vary licences to stop or reduce spray irrigation. You can read more about section 57 restrictions in our [guidance](#).

What are hands off flow or level conditions?

A hands off flow (HoF) or level (HoL) condition allows us to reduce or stop abstraction when flows at a gauging station, or levels in a borehole, pass a specified threshold.

Around 40 per cent of surface water licences and three per cent of groundwater licences contains these conditions. Overall, one quarter of abstraction licences are subject to a flow or level restriction. This reflects that many older licences did not contain HoFs, but we now include them on most new or varied licences.

How do you set these conditions?

We use the outputs from our catchment abstraction management strategies (CAMS), which takes account of the requirements of the Water Framework Directive (WFD), to set HoF conditions. The 'Environmental flow indicator' (EFI) in CAMS tells us how much water we need to protect for the environment, so we use HoF conditions to ensure that abstractions do not cause river flows to fall below the environmental flow indicators. We base these thresholds on best available data and information about in-river needs and minimum flows required to sustain ecology and protect other abstractors. If an applicant can demonstrate that applying a lower (or no) HoF will still meet these and the requirements of the WFD, we will consider their proposal. These situations are rare.

Rivers that are over abstracted, or have little water available at low flows, will have relatively high hands off flow thresholds. New abstractions from such rivers will tend to be limited more of the time when the flow is below the hands off flow threshold. Where more water is available, we will apply lower or no hands off flow conditions, so abstraction under these licences will be more reliable.

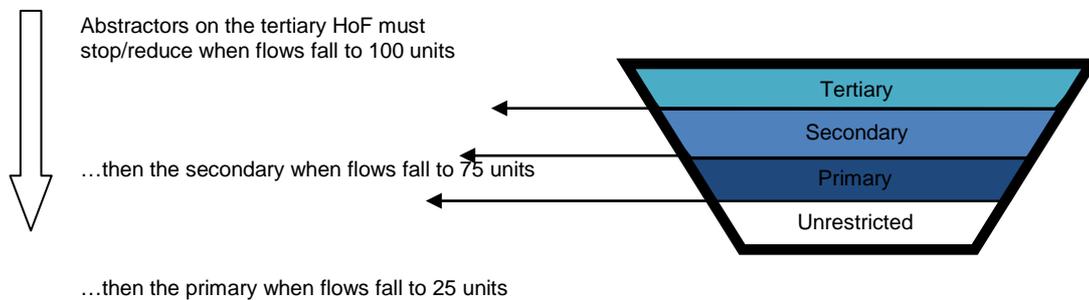
In some areas, we put HoF conditions on winter abstraction licences because higher flows play an important role in:

- flushing sediment from our rivers;
- acting as a cue for fish migrations;
- preventing invasive plant species colonising exposed river sediments, such as gravels bars, temporary islands;
- preventing saline water migrating upstream in tidal reaches, especially during a storm surge, which could kill fish and invertebrates.

Our hydrogeologists set HoL conditions using their local knowledge and expertise. These conditions allow the natural discharge to surface water features to continue to protect other users, protect surface features such as wetlands, maintain the overall resource of the aquifer and prevent ingress of any poor quality groundwater.

How do you manage HoFs?

In most rivers, we operate 'tiered' HoFs, so as river flows reduce at our gauging stations, we progressively restrict more abstractors. When the quantity of water available at the lowest, or least restrictive HoF is licensed away (the 'primary' threshold), the water available at the next HoF is taken and so on. See below:



The tertiary or newest abstractors are restricted first, thereby protecting the environment and those with historic abstraction rights. As flows continue to fall, the secondary and then primary restrictions come into force. The final set of unrestricted abstraction licence holders can continue abstracting until we impose a section 57 restriction (which only applies to spray irrigators) or we apply to government for a drought order.

When a time limited licence is renewed, does the HoF or HoL change?

If more water becomes available (because a large abstraction licence has been revoked, for example) or a feature no longer needs protecting, we will relax the restriction, but this is very rare. If less water is available, we may have to make the HoF or HoL conditions more restrictive. Our CAMS documents will explain and justify any changes, and our staff would discuss any change with abstractors applying to renew their licence.

How will I find out if a HoF or HoL condition is in force?

Because we have been including HoF and HoL conditions in abstraction licences for over 30 years, we have developed different approaches to manage these with different abstractors. On the River Wye, for example, we operate an automated phone line, where the abstractor calls us to find out what the flow is at the relevant gauging station before they start abstracting.

In other areas, we write, email or call abstractors to tell them when the HoF is in force and when we have lifted it. When flows are especially low, we endeavour to call or email abstractors so they know as soon as water is available. We are looking into publishing live river flows on the internet in future, so abstractors could check river flows themselves. The conditions of a licence apply regardless of any additional alerts or warnings we may give.

HoL conditions are often set in the abstraction borehole, so the abstractor can check the level themselves.

What happens if there isn't a river gauging station near me?

If we cannot set or manage a HoF using one of our gauging stations, we will ask the licence holder to install their own measurement structure. They must then check there is enough water available before abstracting. This kind of 'local prescribed flow' condition is relatively rare on new licences but may still be in place on older licences.

Appendix B. Water Rights Trading Pre application form WR48

(Environment Agency)

Water abstraction or impoundment

Preliminary enquiry form



Environment Agency

Water Resources Act 1991 (as amended by the Water Act 2003), Environment Act 1995,
The Water Resources (Abstraction and Impounding) Regulations 2006

Please read through this form and the guidance notes that came with it. Please write clearly in the answer spaces.

It will take about 15 minutes to fill in this form.

You'll need:

- Map clearly showing the point of abstraction

Use this form for pre-application enquiries for:

- surface water abstractions over 20 cubic metres (4,400 gallons) per day or impoundment enquiries
- complex variations.

If you are abstracting from groundwater you do not need to fill in this form, please contact us on 03708 506 506 (Mon–Fri 8am–6pm).

Contents

- 1 Contact details
 - 2 Restoring Sustainable Abstraction
 - 3 Details of abstraction
 - 4 Aggregate licence
 - 5 Location details
 - 6 Abstraction details
 - 7 Discharge details
 - 8 Impoundment and/or reservoir
 - 9 Additional information
 - 10 Checklist
 - 11 The Data Protection Act 1998
 - 12 Next steps
- Guidance notes

1 Contact details

1.1 Contact name

Title (Mr, Mrs, Miss and so on) _____

First name _____

Last name _____

Name of company or organisation, if applicable

1.2 Address

Postcode _____

1.3 Contact numbers, including the area code

Phone _____

Mobile _____

Email _____

1.4 Are you the:

applicant? Please go to question 1.6

agent?

advisor?

1.5 Applicant's name

Title (Mr, Mrs, Miss and so on) _____

First name _____

Last name _____

Name of company or organisation, if applicable

1 Contact details, continued

1.6 Have you spoken to anyone in the Environment Agency about the proposal?

Yes Please give details and contact names below

No

Details

2 Restoring Sustainable Abstraction

2.1 Is this enquiry a result of restoring sustainable abstraction (RSA)?

Yes

No

3 Details of abstraction

3.1 Is your enquiry:

for a new proposal? Please go to question 3.3

to vary an existing licence?

3.2 Existing licence number

3 Details of abstraction, continued

3.3 What licence type are you enquiring about?

- Full
- Temporary (less than 28 days)
- Transfer
- Impoundment

3.4 What activity is undertaken at your site?

4 Aggregate licence

4.1 Is this abstraction to be aggregated with an existing licence?

- Yes
- No Please go to question 5.1

4.2 Licence number, if applicable

4.3 Details

5 Location details

Please send us a map (see guidance) showing each point, reach or area you intend to abstract water from.

5.1 Please give us location details of the proposed abstraction

Abstraction name

Type of location

NGR 1

NGR 2

NGR 3

NGR 4

Do you have a right of access?

- Yes
- No

5 Location details, continued

Do you require planning permission?

- Yes
- No

Status and consent number

6 Abstraction details

6.1 Please give us details of the proposed abstraction. We need to know:

- the source of supply – see guidance notes
- the purpose of abstraction – see guidance notes
- the quantities of water that you wish to abstract.

Source of supply

Purpose (please be specific)

When do you plan to use the water?

Maximum yearly (m³)

Maximum daily (m³)

Peak abstraction rate (l/sec)

7 Discharge details

Please send us a map (see guidance) showing each point you intend to discharge water to.

7.1 Do you intend to discharge water from the site?

- Yes
- No Please go to question 8.1

7.2 Discharge site name

7.3 What will you be discharging to?

7.4 What volume of water will be discharged?

7.5 National grid reference(s) of discharge

NGR A _____

NGR B _____

NGR C _____

7.6 Discharge consent number, if applicable

8 Impoundment and/or reservoir

8.1 Description of works

Dam

Weir

8.2 Details of works

8.3 Capacity of impoundment and/or reservoir (m³)

8.4 Will there be an abstraction from the resulting impoundment?

Yes

No

9 Additional information

9.1 Please give us any other details that will help us to deal with your enquiry

10 Checklist

Please read through this list and tick the items you are sending us:

a completed form WR48

a map showing abstraction and discharge points

continuation sheets for answers to questions

Please state how many

11 The Data Protection Act 1998

We, the Environment Agency, will process the information you provide so that we can deal with your enquiry.

We may also process or release the information to:

- offer you documents or services relating to environmental matters;
- consult the public, public organisations and other organisations (for example, the Health and Safety Executive, local authorities, the emergency services, the Department for Environment, Food and Rural Affairs) on environmental issues;
- carry out research and development work on environmental issues;
- prevent anyone from breaking environmental law, investigate cases where environmental law may have been broken, and take any action that is needed;
- assess whether customers are satisfied with our service, and to improve our service; and
- respond to requests for information under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004 (if the Data Protection Act allows).

We may pass the information on to our agents or representatives to do these things for us.

12 Next steps

Please return this form and an accompanying map to **Water Resources Permitting Support Centre, Quadrant 2, 99 Parkway Avenue, Parkway Business Park, Sheffield, S9 4WF.**

If you need to talk to someone about this form or require assistance filling it out, please contact the National Customer Contact Centre on 03708 506 506 (Mon–Fri 8am–6pm).

We will get in touch with you shortly, either to tell you our decision on your enquiry, or to ask for further information to help us with your enquiry.

For Environment Agency use only

Notification reference number

Date received (DD/MM/YYYY)

Water abstraction or impoundment

Guidance notes



Water Resources Act 1991 (as amended by the Water Act 2003), Environment Act 1995,
The Water Resources (Abstraction and Impounding) Regulations 2006

About this form

Only use this form for **pre-application** enquiries:

- for abstraction of water
- to impound water
- for complex variations.

This is **not** a formal application form. If you wish to formally apply for an abstraction or impoundment licence or wish to formally vary an existing licence please contact the National Customer Contact Centre (NCCC) on 03708 506 506.

If you need more space for any of your answers please continue on a separate piece of paper. Make sure that you label each sheet clearly and tell us which question it applies to.

1 Contact details

Please complete this section including contact numbers and an email address where possible.

If you are or have appointed an advisor or agent please enter details of the person you wish to be contacted regarding the enquiry.

2 Restoring sustainable abstraction

The Restoring Sustainable Abstraction (RSA) Programme was set to identify and catalogue those sites which may be at risk from unsustainable abstraction.

The RSA Programme is a way of prioritising and progressively examining and resolving these concerns.

If through previous communication with the Environment Agency you are varying your abstraction licence due to RSA, you need to tick the appropriate box.

Please provide any details of previous communications in section 1.6.

3 Details of abstraction

3.1 Type of enquiry

Please tick the type of proposal you are enquiring about.

If you are enquiring about varying an existing licence to abstract water, summarise the changes you are applying for in section 10.

When you complete the rest of the application form, show the total that you now wish to have licensed.

For example:

- If you want to increase the quantities of water you are licensed to abstract, give the new maximum quantities required, not the quantity you want them increased by.
- If you want to abstract water from additional points, show the existing abstraction points as well as the new ones.

3.3 Type of licence

There are four types of licence. Please tick the most appropriate type of licence that you are enquiring about:

- A full licence is to abstract water from a source of supply over a period of 28 days or more.

- A transfer licence is to abstract water over a period of 28 days or more from one source of supply for the purpose of transferring it to another source of supply without intervening use.
- A temporary licence is to abstract water from a source of supply over a period of less than 28 days.
- An impoundment licence is required for works that impound, obstruct or impede the flow in an inland water such as a dam, weir or similar.

4 Aggregate licence

We need to know if you are enquiring about aggregating, or linking, the proposed abstraction with an existing abstraction licence.

5 Location details

Abstraction name

Name the abstraction point – that is, point 1, 2 and so on – or, if the inland water or underground source has a local name, please give it.

If there is more than one abstraction point please continue in section 10, including all details contained within this section for each separate point of abstraction.

Type of location

The type of location will either be:

- a single point – you only need to enter one National Grid Reference (NGR)
- a stretch – you will need to enter two NGRs of the points between which you plan to abstract
- an area – you will need to enter four NGRs of the points between which you plan to abstract.

You **must** give a ten-figure grid reference.

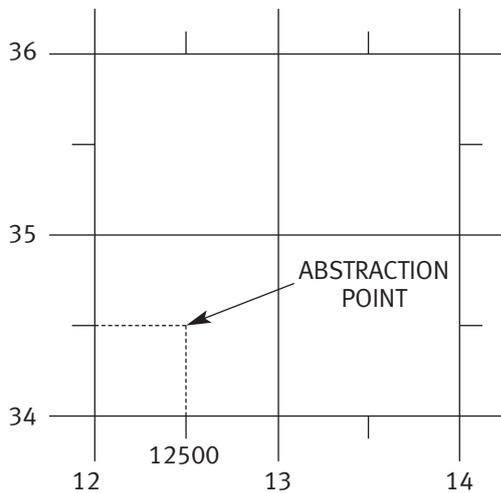
National grid reference

An NGR is not the same as a field number.

To work out the NGR of your proposed abstraction to the nearest ten-metre square:

- Read the two letters identifying the 100,000-metre square (you can find this on the front cover of the 1:10,000 scale maps). In this example it is ST.
- Locate the first vertical grid line to the left of your proposed abstraction and read the numbers labelling the line on either the top or bottom margin of the map. In this example it is 12.
- Locate the first horizontal grid line below the proposed abstraction and read the numbers labelling the line on either the left or right margin of the map. In this example it is 34.

The area can then be easily located within that grid square, as shown in the diagram.



If you imagine the square is split into ten sections across and ten down, the final grid reference is ST 12500 34500.

Right of access

You may only apply for a licence to abstract water if you have, or expect to have, a right of access to the land directly adjoining the inland water, or the land consisting of, or comprising, those underground strata from which you are applying to abstract. This right of access must continue for a period of at least one year or the duration of the licence.

Planning permission

Where part or all of a project requires planning permission the planning authority may have requested an environmental statement. In this case water-related issues may already have been covered that will assist us in your pre-application enquiry.

6 Abstraction details

If there is more than one purpose please continue in section 10, including all details contained within this section for **each** separate purpose.

Source of supply

Please choose from the following sources of supply:

River or stream, bypass channel, leat, pipe, seepage lagoon, spring, tidal waters, on-stream impoundment, spring-fed catchpit (pumped), spring-fed catchpit (gravity), off-stream reservoir, on-stream reservoir.

Purpose

If the water is required for industrial or commercial use, please say what the business is and how the water will be used, distinguishing between different uses.

Please be as specific as possible; for example 'trickle irrigation' as opposed to just 'irrigation', or 'non-evaporative cooling' as opposed to just 'cooling'.

When do you plan to use the water?

Please state the months in which you plan to abstract; for example, November to March.

Maximum yearly

For each purpose, give the maximum amount of water you propose to abstract in any one year (in cubic metres).

Maximum daily

For each purpose, give the maximum amount of water you propose to abstract in any one day (in cubic metres).

This could be more than the yearly quantity divided by the number of days.

Peak abstraction rate

For each purpose, give the maximum rate (in litres per second) that you plan to abstract at any given moment.

7 Discharge details

We need to know:

- if you intend to discharge used water from the site
- the name of the discharge location
- what inland water you will be discharging to; for example, a public sewer or a soakaway
- how much of the water you abstract will be discharged after use
- a ten-figure NGR for each of the discharge locations. Mark each of the discharge points (A, B, C) on the map.

The discharge may need consent from us (in relation to pollution control). If you need to discuss whether you need consent please phone 03708 506 506. **This can take up to four months so early contact with us is essential.**

8 Impoundment and/or reservoir

8.2 Detail of works

Describe the impounding works and/or reservoir, if applicable, in as much details as possible. Include:

- details of any existing works and the proposed alterations
- how the works will affect the flow of the inland water.

8.3 Capacity of impoundment and/or reservoir

You must inform the National Reservoir Safety Team at Manley House, Kestrel Way, Exeter EX2 7LQ or email reservoirs@environment-agency.gov.uk if the work you plan will impound more than 25,000 cubic metres of water, which is above the natural level of the lowest point of the adjoining land.

8.4 Further abstraction

Under the Water Resources Act 1991 (as amended), an abstraction licence from the Environment Agency will usually be needed if you want to abstract water from a surface water source. Abstraction from the resulting impoundment may require an abstraction licence.

Appendix C. Environment Agency letter to water companies - Achieving sustainable abstraction

(September 2016)

Information Letter: EA/2016
Date: 30 September 2016

To: Regulatory Contacts in Water Companies in England

Achieving sustainable abstraction

Dear Sir/Madam

It is our role to ensure that abstraction is sustainable and does not damage the environment. We aim to achieve sustainable abstraction by the early 2020s. Water companies have a significant role to play in achieving sustainable abstraction and have a duty to have regard to River Basin Management Plan (RBMP) objectives when carrying out their activities. Water companies must demonstrate through their Water Resources Management Plans (WRMPs) that they have solutions in place to resolve existing environmental problems caused by abstraction and also to prevent deterioration.

Water companies are already delivering significant environmental improvement through the Water Industry National Environment Programme. However, further action is required to tackle the most seriously damaged water bodies and to address deterioration risk. We did not have sufficient certainty around these requirements to include in phase 5 of the Water Industry National Environment Programme for PR14 but they need to be considered in your forthcoming draft WRMP and business plan for PR19.

We have also changed the way we assess deterioration risk. Our deterioration risk assessment for the RBMPs assessed the consequence of licences being used at their full capacity. We identified that assessing deterioration risk in this way could have a significant impact on water company security of supply and drive unnecessary investment. We have worked with a water industry task and finish group to identify a pragmatic approach to managing the risk of deterioration caused by abstraction. Going forward, we will now additionally consider the likelihood of abstraction increasing to determine deterioration risk. Further detail on our approach is given below.

Our approach to managing deterioration risk

We have decided to use planned increase in abstraction as the trigger to take action on deterioration risk. We have developed a prioritised approach to addressing deterioration risk that:

- works within the existing WRMP /AMP framework
- is risk based, focusing on the most damaging abstractions first
- seeks to avoid mandatory licence changes and use of Article 4.7

Actions needed by February 2017

When preparing your draft WRMP you need to ensure that any new or planned increases to abstraction would not cause deterioration. To help you do this, we will be sending an information pack containing data on all your licences to your Water Resources Technical Manager. We encourage you to view the dataset as a starting point to inform dialogue with our local Area Water Resources officers. We will provide your Technical Managers with local Area contacts with whom they can work through the list of abstraction licences.

You will have more detailed information on how you plan to use your licences. We would like you to confirm that your licences are sustainable or set out how you plan to manage potential impacts by end February 2017. We will use this information to inform the Water Industry National Environment Programme release in March 2017.

If you have any queries please contact: Owen Turpin: owen.turpin@environment-agency.gov.uk

Copies of this letter are being sent to Sarah Mukerjee at Water UK, Sarah Heineman at Defra, Graeme Hayes at Natural England and Caroline Harris at NRW for their information.

This letter is being sent electronically to Regulatory Contacts and hard copies of the letter will not be sent.

Yours sincerely

A handwritten signature in black ink, appearing to read 'P Hickey', written in a cursive style.

Paul Hickey
Deputy Director - Water Quality and Water Resources

Appendix D. Investigating Yorkshire Water's opportunities for water rights trading

(copy of proposal)

Extension Proposal

Project:	Yorkshire Water Sector Scoping	To:	Steven Jackson, John Hartley and Daniel Oxley
Subject:	Proposed Project Extension - Water Licence Trading V2	From:	Matt Shipton
Date:	14 Jun 2016	cc:	Mike Woolgar and Ben Piper

Background

Many existing abstraction licenses are unused or underused, even in dry years. This suggests there is scope for improving the licencing system so that water is available to users who most need it.

Licence trading is possible under the Water Resources Act 2003 but the process is complicated and has not been widely taken up. Abstraction reforms are expected in the early 2020's to seek to create a better, fairer licencing system. Their objectives are multifaceted, though, with regard to Kelda Groups interests, they can be summarised as being to reduce water waste, cut red tape, help businesses to respond better to short term low flows and to enable a focus on long term business investment and growth. It is also noteworthy that the new system will be embedded in local catchment decision-making and driven by the value of water.

Approach

Task 1) Licence trading - process review and summary of reforms

In light of impending reforms and at Kelda Groups request Atkins is able to provide a review of the current abstraction license trading process. This will describe the practical stages involved, fees and risks e.g. being forced onto a licence with a limited duration or losing some of the redundancy that can be offered by 'paper water', i.e. the buffer that is made up of the difference between the licence amount and what is usually actually abstracted. The review will also include an examination of how different timing and peak flow rate requirements of different users can be represented in a trade and what the potential costs might be. This is important since although capital costs - i.e. licence and admin fees - may be low, attaining approval for a trade from the Environment Agency may require substantial effort and incur professional fees for services such as environmental studies, flow monitoring and legal agreements. There may also be a requirement for increased monitoring subsequently.

Building on Atkins experience from our UKWIR work to assess the possible impact on public water supply licence holders of Defra's proposals for abstraction reform paper, we will then outline the key changes the proposed reforms will implement and the associated risks and opportunities they may create for Kelda Group. If they are found to be easily available we will also provide selected relevant case studies and learning from wider water industry thinking on the topic (noting that we are only able to do this where the data is already in the public realm).

Extension Proposal

Task 2) Identification of potential opportunities for licence trading

Following review of the current process and proposed reforms Atkins will undertake a broad assessment to identify the main potential opportunities for Yorkshire Water to undertake abstraction licence trades.

Following consultation with Kelda Group the proposed assessment will be focused on identifying potential trades that would be most beneficial to Yorkshire Water – for example to increase the licence capacity of sources identified in the WRMP as operating close to their deployable output or to create revenue from ‘headroom’ that is available at under-utilised sources, for example by trading it, subject to conditions, to farmers for irrigation or to other users/industries.

The assessment will be undertaken by collecting licence details and historical average annual abstraction rates for each Yorkshire Water surface water source (data to be supplied by Kelda Group) and then using this data to calculate the average annual ‘paper water’, available at each source. Large third party abstraction licences that may potentially be part of a trade will then be identified around each Yorkshire Water source that is running close to capacity with regard to its licence. It is noted that it is unlikely that returns data for third party abstractions will be available so, at this stage, the assessment will not go any further than identifying potential trades based on licence size and proximity to the Yorkshire Water source in question. A similar assessment will then be undertaken to identify owners of third party abstractions that paper water could be traded to from those Yorkshire Water sources with significant capacity on their licence above their actual abstraction.

Team

Matt Shipton will take overall responsibility for the delivery of the work with assistance from other team members whose CV’s are included in our original proposal. Additionally, Ben Piper will join the team with a back stopping role. Ben is Atkins Technical Director for Water Resources Planning. He has 35 years of experience of hydrology and water resource planning and his UK work includes policy and strategic advice to regulators, water companies and government departments including Abstraction Licence Reform and the on-going national-scale project for Water UK on long-term resilience in water resources. Ben was the Project Director for two UKWIR projects for the development of new water resource planning methodologies for WRMP19. His CV is available on request.

Programme and deliverables

We are able to deliver the literature review of the current process and proposed reforms by Aug 19th 2016. A draft for comment would be issued two weeks prior to this. The broad assessment of opportunities for abstraction licence trading could be completed by September 30th 2016. Deliverables for this would be the assessment results (excel and GIS files). The results would be made available on the web map platform developed for the parent job where the assessment method would also be summarised.

Costs

Our total financial proposal for undertaking this additional work is a fixed price of £8,889, exclusive of VAT. Task one could be undertaken independently for a fixed price of £3,544, exclusive of VAT. Task two could be undertaken independently for a fixed price of £5,345, exclusive of VAT.

Our Offer is valid for 30 days, is subject to the terms already agreed on the parent job and, although none are anticipated, does not cover any data costs that may be incurred. This extension does not include budget for approaching third party licence holders or pursuing individual trading opportunities in more detail than described above.

Extension Proposal

Risks

The following risks have been identified:

- Data availability – it is assumed data will be available when required from the parent job;
- Timing of startup – it is assumed there will be no significant delays in startup, any major delays would push back our deliverable dates;
- We have not budgeted for processing or QA of Yorkshire Waters abstraction data – it is assumed the data can be provided at an acceptable quality in the format required;
- Additional processing/reporting time may be required if during the project there are major announcements from Defra on implementation of ALR plans etc.

Potential additional work not included in scope – these tasks can be individually priced on request

Natural capital

Additional work, not included within this scope, could be undertaken to understand the natural capital in each catchment since knowing the value of the ecosystems may facilitate selling ‘paper water’ back to the Environment Agency so they can achieve environmental protection or recreational enhancement objectives. Similarly fishing clubs could also be interested in purchasing paper water to secure their stock. This would provide Yorkshire Water with positive PR which may offset the possibly small financial benefit they would bring – “YW gives X MLD to provide X ,Y and Z benefits for the environment and society”. This approach may also help justify drought permit actions required when the company needs more water.

Identification of constraints

Further additional work, also not included in this scope, could be undertaken to identify potential constraints and blocks to trading opportunities - understanding these would be a logical next step since it would provide a feel for which opportunities were worth pursuing in more detail and which were not. It would also provide a chance to better examine the scale of potentially viable opportunity across all of Yorkshire Waters sources.

Trading unused water brings the risk of environmental damage if it increases overall abstraction, by activating unused licence capacity. To avoid this, the Environment Agency will only allow trading of unused water as long as the sustainable limit is not reached. When reviewing abstraction licences the Environment

Agency therefore has a sharp focus on recent actual abstractions and on ensuring no deterioration with regard to WFD regulations. With this in mind a final step could be undertaken to estimate the likely acceptability of each of the potential licence trades to the Environment Agency. Based on RBMP, CAMS (see figure) and WFD status data this could incorporate a traffic light ranking to show spatially the anticipated acceptability to the Environment Agency of each licence being involved in a trade. Other criteria could include: checking the buyer’s abstraction point is in the same watercourse as the seller’s (and preferably downstream).



Figure - Water availability at very low flows (Q95) in the Swale, Ure, Nidd and Upper Ouse CAMS area

Should our proposed approach or financial offer not meet with Kelda Groups expectation, we would be very happy to discuss changes.

Appendix E. Environment Agency data on historic water rights trades

Column heading	Description
Trade Ref No.	Reference number for the purposes of the table
Date of trade	Date the trade became effective
Permanent / Temporary	Whether the trade is permanent or temporary
Agency region	Environment Agency region
Purpose (Donor)	Donor licence, purpose for which water used
CAMS (Donor)	Donor licence, Catchment Abstraction Management Strategy (CAMS)
Purpose (Recipient)	Recipient licence, purpose for which water used
CAMS (Recipient)	Recipient licence, CAMS
Annual Quantity (Donor, m ³ /yr)	Donor licence quantity prior to trade
Annual Quantity Traded (m ³ /yr)	Quantity to be traded
%age of full sellers licence	% the traded quantity is of the full [donor] licenced quantity
Sector	Sector e.g. agriculture, industry etc.

Trade Date	Donor Details				Recipient Details			
	Trade Ref No.	Year	Permanent / Temporary	Purpose (Donor)	Abstraction Licensing Strategies (donor)	Purpose (Recipient)	Abstraction Licensing Strategies (Recipient)	Annual Quantity Traded (m ³)
TRADE-0001	2003	Temporary	Water bottling	Test and Itchen	Water bottling	Test and Itchen	22000	Industry
TRADE-0002	2004	Permanent	Spray Irrigation - Direct	BROADLAND RIVERS	Spray Irrigation - Direct	BROADLAND RIVERS	10000	Agriculture
TRADE-0003	2004	Permanent	Spray Irrigation	THAMES CORRIDOR	Spray Irrigation	MOLE	32991	Agriculture
TRADE-0004	2004	Temporary	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL	63500	Agriculture
TRADE-0005	2005	Temporary	Spray Irrigation - Direct	ESSEX	Spray Irrigation - Storage	ESSEX	49100	Agriculture
TRADE-0006	2005	Permanent	General Farming & Domestic	Test and Itchen	Private Water Undertaking	Test and Itchen	1000	not available
TRADE-0007	2005	Temporary	General Farming	Dorset Stour	General Farming	Dorset Stour	5000	Agriculture
TRADE-0008	2005	Temporary	Spray Irrigation	WEY	Spray Irrigation	THAMES CORRIDOR	27276	Agriculture
TRADE-0009	2005	Temporary	General Farming	Hampshire Avon	General Farming	Hampshire Avon	19000	Agriculture
TRADE-0010	2006	Temporary	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL	38500	Agriculture
TRADE-0011	2006	Temporary	Mineral Washing	BROADLAND RIVERS	Spray Irrigation - Direct	BROADLAND RIVERS	60000	Industry
TRADE-0012	2006	Temporary	Spray Irrigation - Direct	OLD BEDFORD INCLUDING MIDDLE LEVEL	Spray Irrigation - Direct	OLD BEDFORD INCLUDING MIDDLE LEVEL	14750	Agriculture
TRADE-0013	2006	Permanent	Process Water	UPPER OUSE & BEDFORD OUSE	Process Water	UPPER OUSE & BEDFORD OUSE	72500	Industry
TRADE-0014	2006	Temporary	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL	9090	Agriculture
TRADE-0015	2006	Temporary	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL	90900	Agriculture
TRADE-0016	2006	Permanent	Spray Irrigation - Direct	Warwickshire Avon	Spray Irrigation - Direct	Warwickshire Avon	24665	Agriculture
TRADE-0017	2006	not available	Spray Irrigation - Direct	EAST SUFFOLK	Spray Irrigation - Storage	EAST SUFFOLK	15200	Agriculture
TRADE-0018	2006	not available	Spray Irrigation - Direct	EAST SUFFOLK	Spray Irrigation - Storage	EAST SUFFOLK	53801	Agriculture
TRADE-0019	2006	not available	Spray Irrigation - Direct	EAST SUFFOLK	Spray Irrigation - Storage	EAST SUFFOLK	15200	Agriculture
TRADE-0020	2006	not available	Spray Irrigation - Direct	EAST SUFFOLK	Spray Irrigation - Storage	EAST SUFFOLK	47962	Agriculture
TRADE-0021	2006	Temporary	Spray Irrigation - Direct	AIRE AND CALDER	Spray Irrigation - Direct	AIRE AND CALDER	25000	Agriculture
TRADE-0022	2006	Permanent	Spray Irrigation - Direct	WEY	Spray Irrigation - Direct	WEY	18184	Agriculture
TRADE-0023	2007	Permanent	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL	63600	Agriculture
TRADE-0024	2007	Permanent	Spray Irrigation - Storage	CAM & ELY OUSE INCLUDING SOUTH LEVEL	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL	57800	Agriculture
TRADE-0025	2007	Permanent	Spray Irrigation - Direct	BROADLAND RIVERS	General Farming	BROADLAND RIVERS	49000	Agriculture
TRADE-0026	2007	Permanent	Spray Irrigation - Direct	WITHAM	Spray Irrigation - Direct	WITHAM	4100	Agriculture
TRADE-0027	2007	not available	Spray Irrigation - Storage	BROADLAND RIVERS	Spray Irrigation	BROADLAND RIVERS	9000	Agriculture
TRADE-0028	2007	Permanent	Spray Irrigation - Direct	BROADLAND RIVERS	Spray Irrigation - Storage	BROADLAND RIVERS	9000	Agriculture
TRADE-0029	2007	Temporary	Spray Irrigation - Direct	OLD BEDFORD INCLUDING MIDDLE LEVEL	Spray Irrigation - Direct	OLD BEDFORD INCLUDING MIDDLE LEVEL	1000	Agriculture
TRADE-0030	2007	Temporary	Mineral Washing	COLNE	Mineral Washing	COLNE	350496	Industry
TRADE-0031	2007	Permanent	Non-Evaporative Cooling / Process Water /	COLNE	Potable Water Supply - Direct	COLNE	4291424	Industry
TRADE-0032	2007	Temporary	Spray Irrigation - Direct	Test and Itchen	Industrial Process of Compost Manufacture	Test and Itchen	50000	Industry
TRADE-0033	2007	not available	Public Water Supply	CAM & ELY OUSE INCLUDING SOUTH LEVEL	Private Water Supply / Private Non-Industrial / General Agriculture	CAM & ELY OUSE INCLUDING SOUTH LEVEL	73000	Water Supply
TRADE-0034	2007	not available	Public Water Supply	CAM & ELY OUSE INCLUDING SOUTH LEVEL	Private Water Supply / Private Non-Industrial / General Agriculture	CAM & ELY OUSE INCLUDING SOUTH LEVEL	73000	Water Supply
TRADE-0035	2007	Permanent	Private Water Supply	CAM & ELY OUSE INCLUDING SOUTH LEVEL	Portable Water Supply	CAM & ELY OUSE INCLUDING SOUTH LEVEL	73000	not available
TRADE-0036	2008	Temporary	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL	15000	Agriculture
TRADE-0037	2008	Temporary	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL	30000	Agriculture
TRADE-0038	2008	Temporary	Spray Irrigation - Direct	OLD BEDFORD INCLUDING MIDDLE LEVEL	Spray Irrigation - Direct	OLD BEDFORD INCLUDING MIDDLE LEVEL	4546	Agriculture
TRADE-0039	2008	Temporary	Spray Irrigation - Direct	OLD BEDFORD INCLUDING MIDDLE LEVEL	Spray Irrigation - Direct	OLD BEDFORD INCLUDING MIDDLE LEVEL	4333	Agriculture
TRADE-0040	2008	Temporary	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL	10000	Agriculture
TRADE-0041	2008	Temporary	Spray Irrigation - Direct	OLD BEDFORD INCLUDING MIDDLE LEVEL	Spray Irrigation - Direct	OLD BEDFORD INCLUDING MIDDLE LEVEL	22727	Agriculture
TRADE-0042	2008	Permanent	Spray Irrigation - Direct	Shropshire Middle Severn	Process Water	Shropshire Middle Severn	35400	Industry
TRADE-0043	2008	Permanent	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL	9355.27	Agriculture
TRADE-0044	2008	Permanent	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL	50000	Agriculture
TRADE-0045	2008	Temporary	Spray Irrigation - Direct	UPPER OUSE & BEDFORD OUSE	Vegetable Washing	UPPER OUSE & BEDFORD OUSE	50000	Agriculture
TRADE-0046	2009	not available	Spray Irrigation - Direct	Dee	Spray Irrigation - Direct	Dee	30300	Agriculture
TRADE-0047	2009	not available	Spray Irrigation - Direct	BROADLAND RIVERS	Mineral Washing / Process Water / Dust Suppression	BROADLAND RIVERS	30380	Agriculture
TRADE-0048	2009	not available	Spray Irrigation - Direct	Essex CAMS	Spray Irrigation - storage	Essex CAMS	29100	Agriculture
TRADE-0049	2010	Temporary	Spray Irrigation -Direct	Lower Trent & Erewash	Spray Irrigation - Direct	Lower Trent & Erewash	27500	Agriculture
TRADE-0050	2010	Temporary	Spray Irrigation - Direct	Test & Itchen	Spray Irrigation - Direct	Test & Itchen	9090	Agriculture
TRADE-0051	2010	Permanent	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL CAMS	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL CAMS	25000	Agriculture
TRADE-0052	2010	Permanent	Spray Irrigation - Direct	BROADLAND RIVERS CAMS	Mineral Washing	BROADLAND RIVERS CAMS	60000	Agriculture to Industry (extractive)
TRADE-0053	2010	Temporary	Spray irrigation storage	Warwickshire Avon	Male-up Or Top Up Water	Warwickshire Avon	8900	Agriculture
TRADE-0054	2010	Temporary	General Farming & Domestic & Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL CAMS	Spray Irrigation - Direct	CAM & ELY OUSE INCLUDING SOUTH LEVEL CAMS	20000	Agriculture
TRADE-0055	2011	Permanent	Spray Irrigation - Direct	Old Bedford including Middle Level	Spray Irrigation - Direct	Old Bedford including Middle Level	3391	Agriculture
TRADE-0056	2011	Permanent	Spray Irrigation - Direct	Old Bedford including Middle Level	Spray Irrigation - Direct	Old Bedford including Middle Level	22730	Agriculture
TRADE-0057	2011	not available	Spray Irrigation - Direct	BROADLAND RIVERS CAMS	Spray Irrigation - Direct	BROADLAND RIVERS CAMS	23600	Agriculture
TRADE-0058	2011	Permanent	Spray Irrigation - Direct	Old Bedford including Middle Level	Spray Irrigation - Direct	Old Bedford including Middle Level	22727	Agriculture
TRADE-0059	2011	Permanent	Spray Irrigation - Direct	Old Bedford including Middle Level	Spray Irrigation - Direct	Old Bedford including Middle Level	5910	Agriculture
TRADE-0060	2011	Temporary	Spray Irrigation - Direct	BROADLAND RIVERS CAMS	Industrial - Extractive	BROADLAND RIVERS CAMS	20000	Agriculture to Industry (extractive)

Matt Shipton
Epsom Gateway
Office address

Email: matt.shipton@atkinsglobal.com
Telephone: 07734138635

© Atkins Ltd except where stated otherwise.

The Atkins logo, 'Carbon Critical Design' and the strapline
'Plan Design Enable' are trademarks of Atkins Ltd.