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Aire and Calder Abstraction Licensing Strategy

February 2013

A licensing strategy to manage water resources sustainably

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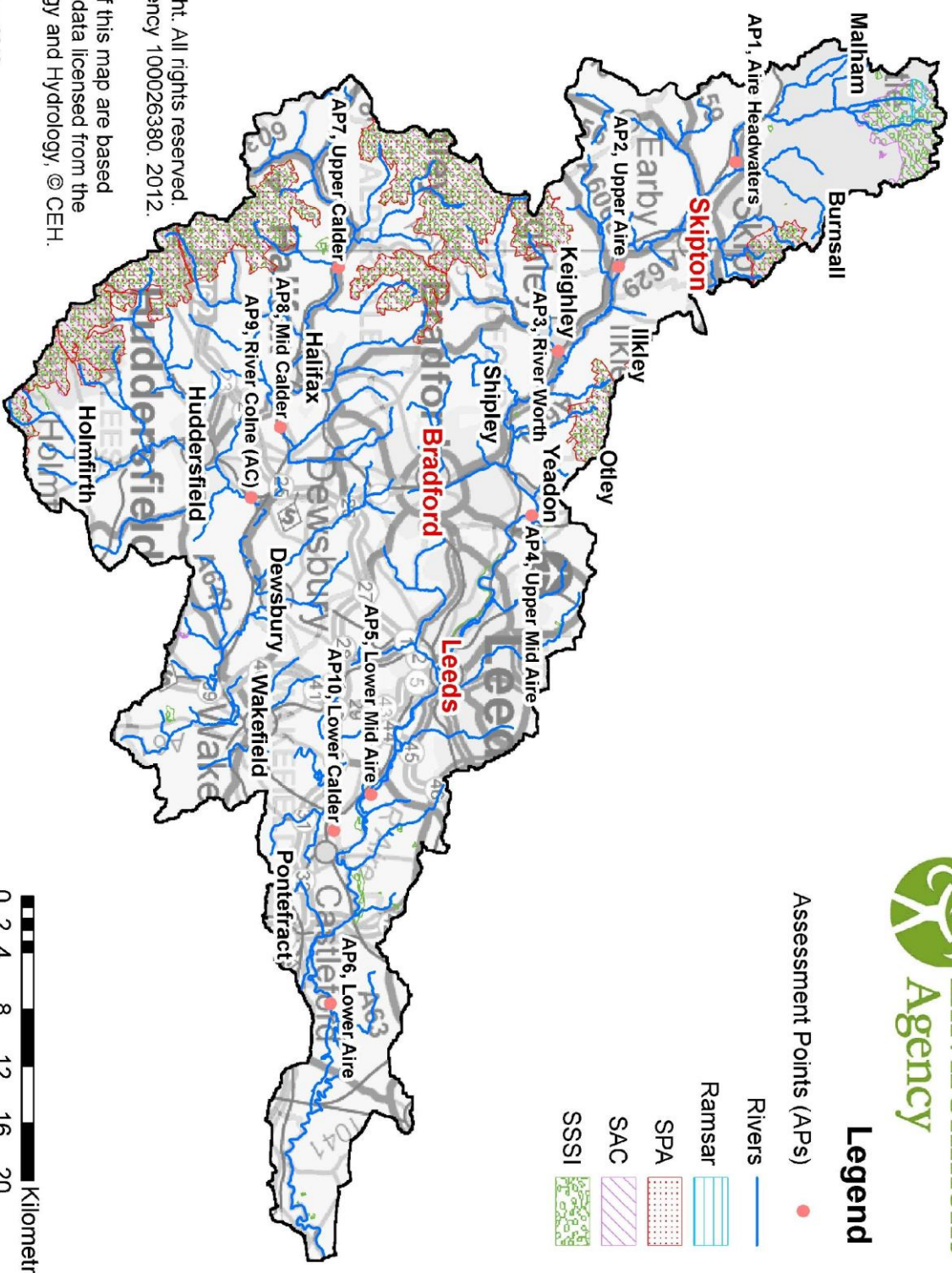
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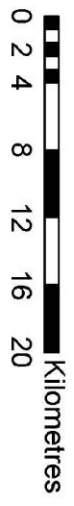
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Aire and Calder CAMS Area



Legend

- Assessment Points (APs) ●
- Rivers —
- Ramsar —
- SPA —
- SAC —
- SSSI —



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Map 1 Aire and Calder CAMS (Catchment Abstraction Management Strategy) area

Foreword

Water is the most essential of our natural resources, and it is our job to ensure that we manage and use it effectively and sustainably. The latest population growth and climate change predictions show that pressure on water resources is likely to increase in the future. In light of this, we have to ensure that we continue to maintain and improve sustainable abstraction and balance the needs of society, the economy and the environment.

This licensing strategy sets out how we will manage water resources in the Aire and Calder catchment and provides you with information on how we will manage existing abstraction licences and water availability for further abstraction.



Mark Scott

Yorkshire Area Manager

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1. About the Licensing Strategy

This **Licensing Strategy** sets out how water resources are managed in the Aire and Calder area. It provides information about where water is available for further abstraction and an indication of how reliable a new abstraction licence may be.

This strategy was produced in February 2013 and it supersedes the strategy issued in 2007.

How CAMS contributes to achieving environmental objectives under the Water Framework Directive (WFD)

The Water Framework Directive's main objectives are to protect and enhance the water environment and ensure the sustainable use of water resources for economic and social development.

Catchment Abstraction Management Strategies (CAMS) set out how we will manage the water resources of a catchment and contribute to implementing the WFD.

CAMS contribute to the WFD by:

- providing a water resource assessment of rivers, lakes, reservoirs, estuaries and groundwater referred to as water bodies under the WFD;
- identifying water bodies that fail flow conditions expected to support good ecological status;
- preventing deterioration of water body status due to new abstractions;
- providing results which inform River Basin Management Plans ([RBMPs](#)).

When is an abstraction licence required?

You need a licence from us if you want to abstract more than 20 cubic meters (m³) (4,400 gallons) of water per day from a:

- river or stream
- reservoir, lake or pond
- canal
- spring or
- an underground source

Whether or not a licence is granted depends on the amount of water available after the needs of the environment and existing abstractors are met and whether the justification for the abstraction is reasonable.

If you want to apply for an abstraction licence or make changes to a licence that you already have then, please contact us:

- by telephone on 03708 506 506
- by email at enquiries@environment-agency.gov.uk
- or visit our website at www.environment-agency.gov.uk.

Sustainable abstraction

This licensing strategy has been produced using evidence and information gathered during the CAMS process. Through this process we consider the impact of abstraction at all flows. This helps to manage future abstraction more sustainably.

We now assess water resources at a sub-catchment level called water bodies. This means that we can provide more detailed information on the availability of water resources in the Aire and Calder CAMS area compared to the scale used in the previous strategy.

Within this strategy we also outline where we may need to reduce current rates of abstraction and our approach on time limiting licences.

The background, aims and principles of CAMS, the over arching principles we use when managing abstraction licences and links with other initiatives are detailed in our document: [Managing Water Abstraction](#). You should read Managing Water Abstraction when reading this catchment specific licensing strategy.

2. The Aire and Calder CAMS area

[Map 1](#) shows the Aire and Calder catchment.

The Aire and Calder CAMS encompasses an area of approximately 2057km², stretching from Malham and Todmorden in the West to the River Ouse in the East.

The River Calder rises on the Pennine Moors west of Todmorden. It is predominately an urban river flowing through the West Yorkshire settlements of Halifax, Brighouse, Huddersfield, Dewsbury and Wakefield before joining the River Aire at Castleford, 87km from its source.

The River Aire rises high in the Pennine Hills near Malham in the Yorkshire Dales National Park. It flows in a south easterly direction through limestone moorland areas passing Keighley, Bingley, Bradford and Leeds. At Castleford, the river turns eastwards to Goole where it meets the River Ouse, 148km from its source at Malham. From Keighley to Goole, the river flows through populated and industrialised areas.

There is an extensive canal network in the Aire and Calder catchment that includes the Leeds Liverpool Canal which follows close by the River Aire through Skipton and Shipley, then down to Leeds where it joins the Aire and Calder Navigation. The Selby Canal forms an artificial link between the River Aire at West Haddlesey and the River Ouse at Selby. In the Calder catchment the Rochdale Canal runs from the heart of Manchester to its junction with the Calder and Hebble Navigation at Sowerby Bridge. The Huddersfield Narrow Canal is aligned roughly northeast/south-west following the River Colne and the River Tame. The Huddersfield Broad Canal runs between the Huddersfield Narrow Canal in the centre of Huddersfield to the Calder and Hebble Navigation at Cooper Bridge.

The catchment contains over 50 reservoirs licensed to provide water for public supply. The reservoirs in the Pennine uplands at the head of the valley also play a vital role in maintaining a healthy river flow. There are a number of sewage treatment works in the Aire and Calder catchment, which discharge a large quantity of water into both rivers.

The area is topographically diverse ranging from the heights of the Pennines and Yorkshire Dales in the west where elevations exceed 500m AOD, to the low-lying floodplains in the east which are below 50m AOD.

The rocks range in age from Carboniferous (c. 360 million years ago) to Triassic (c. 248 million years ago). The majority of the Aire and Calder CAMS area is underlain by Millstone Grit and Coal Measures. To the east of the catchment these are overlain by a thin band of Magnesian Limestone and Sherwood Sandstone. The Sherwood Sandstone provides one of the major groundwater sources for Yorkshire's public water supply. The upper headwaters of the Aire are underlain by Carboniferous Limestone, which forms the source of the river and is the oldest rock in the area.

Land use in the upper Aire and Calder is centred around dairy cattle and sheep farming, with the drier and freely draining areas in the lower Aire and Calder able to support arable and root crops. In the urban areas of Leeds, Bradford, Wakefield, Huddersfield, Halifax and Castleford land is mostly used for housing. There are significant areas of former industrial land adjacent to the Aire and Calder. These river corridors provide vital green space in the centre of urban areas and have the potential to be further enhanced by new development next to the river.

There are a large number of both surface and groundwater abstraction licences within the CAMS area. These take water from the rivers, reservoirs and groundwater sources within the catchment for use by people and industries. Most of the water used in this catchment is for public water supply, the chemical industry, textiles, mineral washing and some fish farming. The highest non-consumptive use of water in the area is for hydropower and power generation. The canals, rivers and reservoirs are also used for a variety of recreation and leisure activities including pleasure boating, dinghy sailing and canoeing.

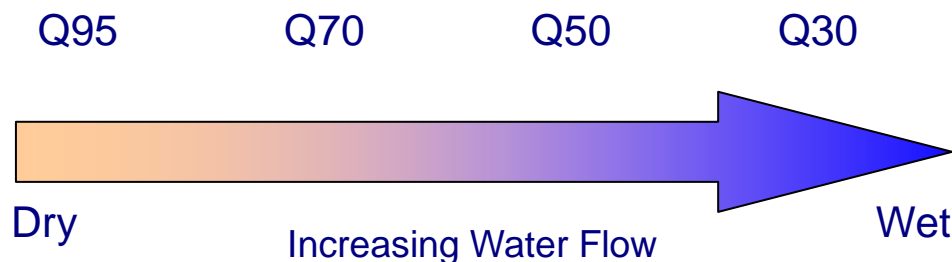
3. Water resource availability of the Aire and Calder area

3.1 Resource assessment

Resource assessment is at the heart of abstraction management. To manage water effectively we need to understand how much is available and where it is available, after considering the needs of the environment. We have a monitoring network to measure river flows and groundwater levels. We use this data along with our knowledge of human influences and environmental needs to establish a baseline of water availability for each water body that builds into a picture for the catchment. The main components of this assessment that help us to understand the availability of water resources are:

- a resource allocation for the environment defined as a proportion of natural flow, known as the Environmental Flow Indicator (EFI);
- the Fully Licensed (FL) scenario – the situation if all abstraction licences were being used to full capacity;
- the Recent Actual (RA) scenario – the amount of water which has actually been abstracted on average over the previous six years.

River flows change naturally throughout the year, so we want to protect flow variability in our rivers from low to high flow conditions. We use flow statistics to help to do this. Flow statistics are expressed as the percentage of time that flow is exceeded. Resource availability is calculated at four different flows, Q95 (lowest), Q70, Q50 and Q30 (highest). Low flows (Q95) reflect very dry conditions and high flows (Q30) reflect very wet conditions.



This information gives a realistic picture of what the current resource availability is within a given water body. Water bodies are sub-catchment surface water units or groundwater units on which we carry out assessments and map results.

[Map 2](#) shows the water resource availability for the Aire and Calder CAMS area at the four different flow values.

3.2 Resource availability

3.2.1 Surface water

If you want to abstract water, you need to know what water resources are available within a catchment and where abstraction for [consumptive](#) purposes is allowed. To show this we have developed a classification system which indicates:

- the relative balance between the environmental requirements for water and how much is licensed for abstraction;
- whether water is available for further abstraction;
- areas where abstraction may need to be reduced.

The availability of water for abstraction is determined by the relationship between the fully licensed and recent actual flows in relation to the EFI. The results mapped onto these water bodies are

represented by different water resource availability colours showing the availability of water resource for further abstraction. The water resource availability colours are explained in Table 1. In addition to these water resource availability colours we've classified some surface water bodies as 'high hydrological status' which are coloured blue on the maps. In these water bodies very little actual abstraction occurs and they show virtually undisturbed, or close to natural, flow conditions.

Another category of water body are Heavily Modified Water Bodies (HMWB). These can be classified for many reasons but for water resources they are classified if they contain a lake and/or reservoir that influences the downstream flow regime of the river. The downstream 'flow modified' water bodies are also classified as heavily modified.

We'll add any conditions necessary to protect flows to a new licence during the licence determination procedure. We will base licence conditions on the water resource availability at different flows (high to low). Table 1 lists the implications for licensing for each water resource availability colour.

In cases where there is a flow deficit ([RA](#) is below the EFI) or risk of a flow deficit ([FL](#) below the EFI), there may be water available for abstraction at higher flows. This means that water may be scarce at low flows, but may be available to abstract at medium or high flows. A licence may still be granted but with conditions which protect the low flows. This usually takes the form of a Hands-Off Flow (HOF) condition on a licence which requires abstraction to stop when the river flow falls below a certain amount. A river may also be heavily supported by flows from a reservoir and may have unnaturally high 'low' flows which means that the river environment is most vulnerable at medium flows.

Water resource availability colour	Implication for licensing
High hydrological regime	There is more water than required to meet the needs of the environment. However, due to the need to maintain the near pristine nature of the water body, further abstraction is severely restricted.
Water available for licensing	There is more water than required to meet the needs of the environment. New licences can be considered depending on local and downstream impacts.
Restricted water available for licensing	Fully Licensed flows fall below the EFIs. If all licensed water is abstracted there will not be enough water left for the needs of the environment. No water is available for further licensing at low flows. Water will be available at higher flows with appropriate restrictions. It may also be appropriate to investigate the possibilities for reducing fully licensed risks. Water may be available if you can 'buy' (known as licence trading) the entitlement to abstract water from an existing licence holder.
Water not available for licensing	Recent actual flows are below the EFI. This scenario highlights water bodies where flows are below the indicative flow requirement to help support Good Ecological Status (as required by the Water Framework Directive. Note: we are currently investigating water bodies that are not supporting GES/GEP). Water may be available for further licensing at high flows with appropriate restrictions. Water may be available if you can buy (known as licence trading) the amount equivalent to recently abstracted from an existing licence holder.
HMWBs (and /or discharge rich water bodies)	These water bodies have a modified flow that is influenced by reservoir compensation releases or they have flows that are augmented. These are often known as 'regulated rivers'. They may be managed through an operating agreement, often held by a water company. The availability of water is dependent on these operating agreements. More detail if applicable can be found in section 4.2.1 Surface Water . There may be water available for abstraction in discharge rich catchments, you need to contact the Environment Agency to find out more.

Table 1 Implications of surface water resource availability colours

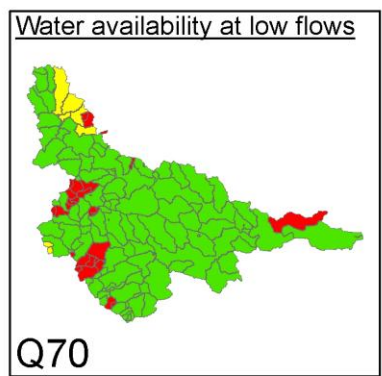
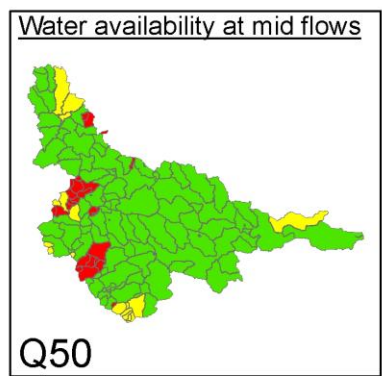
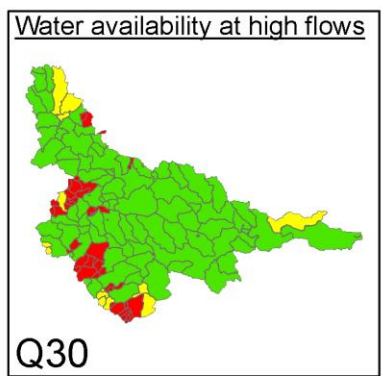
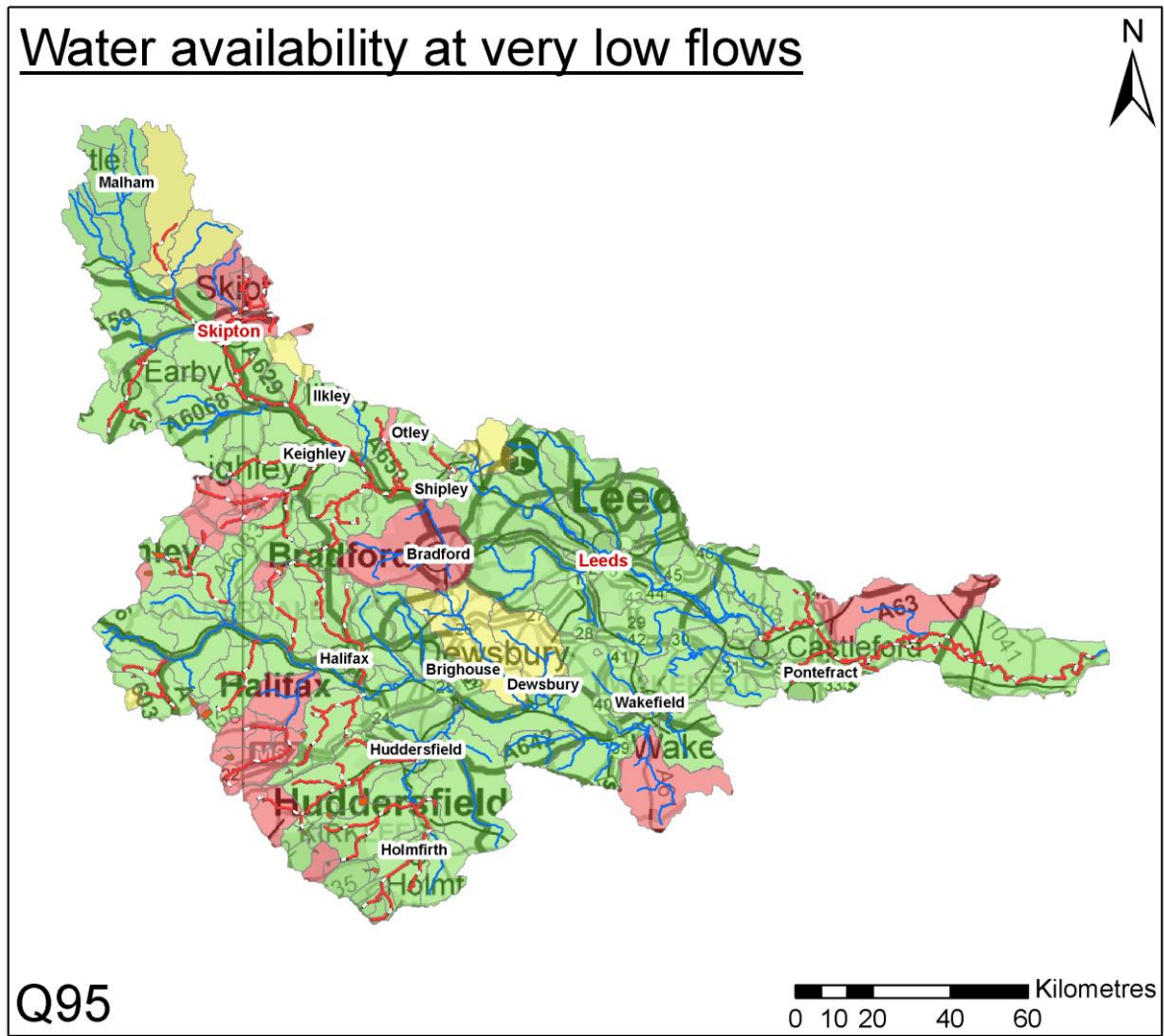
3.2.2 Groundwater

Groundwater availability is guided by the surface water resource availability colours unless we have better information on principle aquifers or are aware of local issues we need to protect. Water availability is different for groundwater and surface water in the Aire and Calder CAMS area. Please refer to [section 4.2.2](#) for further information.

GWMU resource availability colour	Implication for licensing
Water available for licensing	Groundwater unit balance shows groundwater available for licensing. New licences can be considered depending on impacts on other abstractors and on surface water.
Restricted water available for licensing	<p>Groundwater unit balance shows more water is licensed than the amount available, but that recent actual abstractions are lower than the amount available OR that abstraction may cause local impacts likely to occur on water dependent habitats, groundwater levels or cause intrusions.</p> <p>In restricted groundwater units licences will be issued on a case by case basis. Conditions may be applied to licences that link the groundwater abstraction to surface water flows and restrictions. Surface water availability may override groundwater availability. In other units there may be restrictions in specific areas e.g. in relation to saline intrusion.</p> <p>It may be appropriate to investigate the possibilities for reducing fully licensed risks. Water may also be available if you can 'buy' (known as licence trading) the entitlement to abstract water from an existing licence holder.</p>
Water not available for licensing	<p>Groundwater unit balance shows more water has been abstracted based on recent amounts than the amount available.</p> <p>No further consumptive licences will be granted.</p>

Table 2 Implications of groundwater resource availability colours

Map 2 Aire and Calder
 CAMS Resource Availability Colours



- Legend**
- Aire & Calder Rivers
 - Heavily Modified and Artificial Rivers
 - Heavily Modified and Artificial Lakes
 - Aire & Calder CAMS Water Bodies
 - Water Available
 - Limited Water Available
 - No Water Available

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Map 2 Water resource availability colours for the Aire and Calder CAMS

3.2.3 About Map 2 Aire and Calder CAMS Resource Availability Colours

Map 2 shows the water resource availability for the Aire and Calder CAMS area at the four different flow values. Because flows in water bodies vary over time we have tried to show how water resource availability also varies. Map 2 shows this variability and how we are likely to apply restrictions, such as HOFs, to licences.

The largest map, Q95, shows where water is available at very low flows, for instance during dry periods. This represents water resource availability for 5% of the time – most of the time there is more water available than this. Q95 is when there is the least water available for consumptive use and shows where restrictions on licences come into force. Red coloured areas are those where we need licence-holders to stop abstracting at very low flows in order to protect the natural environment and other abstractors further downstream.

Gradually as the flows increase towards Q30, more water is available and can be licensed without risking ecological damage. The resource availability of water at Q30 shows what the situation is for about 30% of the time at high flows, such as when there has been a lot of rainfall. Most of the time there is less water available than this. Certain licences only allow abstraction at high flows, so in some areas there may actually be less water available when flows are high.

3.3 Resource reliability

If you want to apply for a licence, it is worth considering that in some areas a new, consumptive abstraction may not be 100% reliable. Reliability information is based on CAMS resource availability colours and is a way of presenting the reliability of new abstractions at all flows.

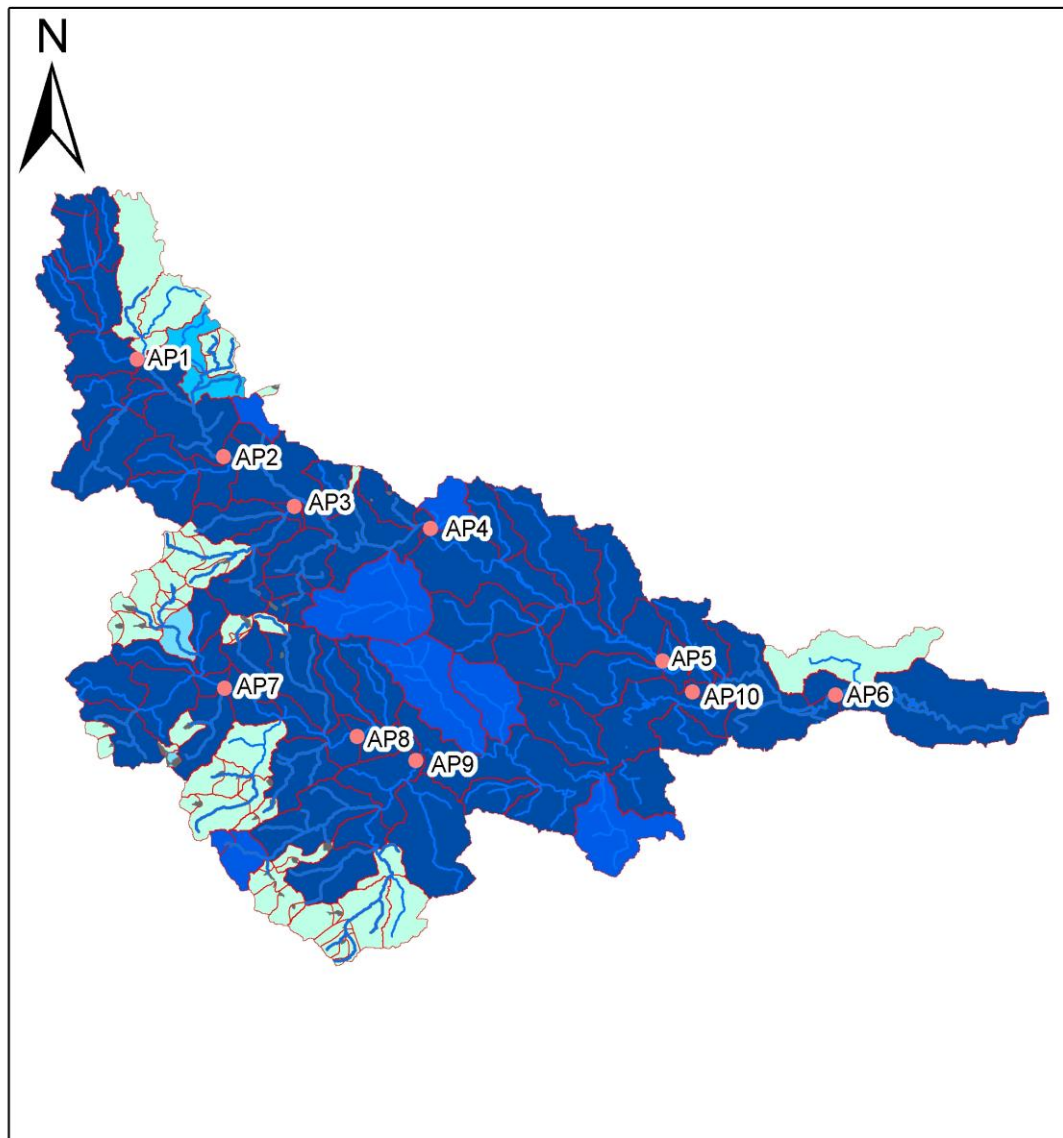
The availability of water for abstraction within a river varies greatly from high to low flows. By assessing the quantity of water available at different flows it is possible to see when there is a surplus or deficit of water and the associated reliability of an abstraction. This is an indication only; actual reliability of a licence will be discussed on application.

Table 3 shows the resource availability colour associated with the percentage reliability of consumptive abstraction. Map 3 gives an indication of the resource reliability in the Aire and Calder CAMS area, expressed as percentage of time. Availability is heavily influenced by reservoirs in the west of the catchment, particularly upstream of Assessment Points 1, 2, 7, 8 and 9.

Resource	Percentage of the time additional consumptive resource may be available
	Consumptive abstraction available less than 30% of the time.
	Consumptive abstraction available at least 30% of the time.
	Consumptive abstraction available at least 50% of the time.
	Consumptive abstraction available at least 70% of the time.
	Consumptive abstraction available at least 95% of the time.
	Not assessed

Table 3 Percentage reliability of consumptive abstraction

Map 3 Aire and Calder CAMS
Resource Reliability (% of the time)



Legend

- Aire & Calder CAMS APs
- Aire & Calder Rivers
- Heavily Modified and Artificial Rivers
- Heavily Modified and Artificial Lakes
- Aire & Calder CAMS Water Bodies
- Water Resources available less than 30%
- Water Resources available at least 30%
- Water Resources available at least 50%
- Water Resources available at least 70%
- Water Resources available at least 95%



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Map 3 Water resource reliability expressed as percentage of time available

4. How we manage abstractions in the Aire and Calder area

4.1 Principles

The document [Managing Water Abstraction](#) outlines the over-arching principles that we follow in managing our water resources. How we apply these principles in the Aire and Calder area is outlined in this section. If you want to abstract water it outlines where water is available for further abstraction and the principles we follow in assessing your application for a licence.

Abstraction licence application process

Anyone wanting to take more than 20m³/day (4,400 gallons) from a 'source of supply' (river, stream, lake, well, groundwater, etc) must have an abstraction licence. The application process for abstraction is similar to the planning process in that we may require the application to be advertised and may require supporting environmental information. When considering the application we check that the quantities applied for and the purpose of the abstraction are reasonable, that there is sufficient water available to support it and that the potential impacts on the environment and other water users are acceptable. Depending on the outcome of our investigations we will issue a licence either as applied for, or with conditions that restrict the abstraction to protect the environment or other users. In certain cases we may have to refuse the application. Any applicant who is not happy with our determination (decision) has the right to appeal against it.

Each application is determined on its own merits

Whilst this document may say that water is available for further abstraction, this does not guarantee that all applications will be successful. We'll determine each application upon its own merits and any local impacts.

A licence does not guarantee that water is available

It's important to understand that when we issue a licence we do not guarantee the supply of water. We have to protect the environment and rights of other abstractors. To do this we may add constraints to licences. Licence holders need to understand the implications of this as it affects the reliability of supply. For example, in drier years it's more likely that conditions will come into effect and abstraction is more likely to be stopped.

Abstractions are managed to protect the environment

No ecological deterioration

We assess the impact of new applications for water to make sure that the resultant river flows:

- will maintain a good ecology or if the ecology is not good, will not deteriorate the ecology of our rivers further;
- will maintain the near pristine condition of high hydrological regime water bodies.

We'll also take action if necessary to limit the increase in current abstraction, if we think this will lead to deterioration of the ecology or the near pristine condition of our high hydrological regime water bodies.

These principles apply to the water body in which the abstraction is located and also to all downstream water bodies that may be affected by any reduction in abstraction related flow. Doing this means that we will maintain the water body status as reported in the River Basin Management Plans (2009) and ensure compliance with the European Union Water Framework Directive.

Water efficiency and demand management

We need to make the best use of our existing water resources. Adopting water efficiency and demand management measures can help us achieve this goal. Water efficiency is one of the tests that will need to be satisfied before we grant a new licence or renew a time limited licence. We will promote the wise and efficient use of water and actions to limit demand (and reduce leakage) to curb the growth in abstraction and limit the impact on flows and any consequent impact on the ecology. For further details on our general approach to licensing please see the document [Managing Water Abstraction](#).

Impoundments

Applications for impoundments will be dealt with on a case by case basis. An impoundment is a dam, weir or other construction in an inland waterway that obstructs or impedes flow and/or raises water levels.

Hydropower

Water abstraction for hydropower schemes is non-consumptive, with all water used returned to the watercourse. Hands-Off Flow conditions and maximum abstraction volumes are determined in line with the Environment Agency's Hydropower Good Practice Guidelines and based on the assessment of environmental risk for each scheme. For further information please refer to our [website](#).

4.2 Abstraction restrictions

When issuing a licence we have to protect the environment and rights of other abstractors. To do this we may add conditions to licences.

Time limited licences

In recognition of changing pressures on water resources all new licences and variations (other than downward variations or minor variations having no environmental impact) will have a time limit imposed. This allows for the periodic review and changes to abstraction licences where circumstances have changed since the licence was granted.

All new licences within a CAMS area have a **common end date** (CED) so they can be reviewed at the same time. When an application is made within six years of the CED, we will generally apply the subsequent CED to any licence granted. This is to avoid issuing shorter and shorter duration licences as the CED approaches. This means that the initial CED on a licence may be between six and 18 years duration. On replacement the normal duration will then usually be 12 years.

However, where we are uncertain about the long term impacts of an abstraction we will grant a short term licence during which time potential impacts are monitored.

31% of the licences in the Aire and Calder CAMS are time-limited. CEDs occur every twelve years. The next CED for the Aire and Calder CAMS is 31 March 2015 and the subsequent one is 31 March 2027.

Additional information about the replacement of time limited licences is available in [Managing Water Abstraction](#).

Hands-Off Flow conditions

To protect the environment we may issue a licence with a condition referred to as a 'Hands-Off Flow' (HOF). This specifies that if the flow in the river drops below that which is required to protect the environment abstraction must stop, hence 'Hands-Off Flow'.

4.2.1 Surface water

We assess surface water flows at Assessment Points (APs) which are significant points on the river, often where two major rivers join or at a gauging station. Where flows fall below the EFI, new abstractions may be subject to HOFs.

Table 4 gives an indication of how much water is available for further abstraction and the associated restrictions that we may apply to new and varied abstraction licences from the main river. Tributaries to the main river may be subject to different restrictions and quantities.

Each HOF is linked to an AP and is dependent on the resource availability at that AP. In some cases additional restrictions may apply to licences where there is a more critical resource availability downstream to protect the ecological requirements of the river. This is detailed in the last column of Table 4 if applicable.

All abstraction licence applications are subject to an assessment to take account of any local and downstream issues and may be subject to further restrictions. Reading from top to bottom in Table 4 are the APs in the Aire and Calder CAMS area. Reading across the columns you can see the

potential HOF that may be applied to a licence, the number of days water may be available under this restriction and the approximate volume of water in megalitres per day (Ml/d) that may be available. In cases where there is water available at all flows we will apply a Minimum Residual Flow (MRF) to protect very low flows.

The Aire and Calder CAMS area contains a lot of discharges and reservoir compensation flows. Table 4 shows where an assessment point incorporates a lot of discharges into its resource assessment (i.e. it is discharge rich). It is important to note that although there may appear to be water available the Environment Agency can only licence discharge water for use under specific conditions. The Environment Agency has no control over the continued operation of these existing users. This means that the input of water is classed as unreliable; we will therefore licence discharge water on a case by case basis.

AP	Name	Water Resource Availability Colour at Q95	HOF Restriction (Ml/d)	Number of days per annum abstraction may be available	Approximate volume available at restriction (Ml/d)	Is there a gauging station at this AP?	Additional restrictions AP name and restriction
1	Aire Headwaters	Water available for licensing	2.3 MRF	365	0.8	Gargrave	Critical AP
2	Upper Aire	Water available for licensing	24.6 MRF	365	5.0	Kildwick	Critical AP
3	River Worth	Water available for licensing	13.0 MRF	365	4.8	Dalton Lane	Critical AP
4	Upper Mid Aire	Water available for licensing	Discharge rich AP - licences to be issued on a case by case basis			No	Critical AP Discharge Rich
5	Lower Mid Aire	Water available for licensing	Discharge rich AP - licences to be issued on a case by case basis			Lemon-royd	Critical AP Discharge Rich
6	Lower Aire	Water available for licensing	Discharge rich AP - licences to be issued on a case by case basis			Beal	Critical AP Discharge Rich
7	Upper Calder	Water available for licensing	Discharge rich AP - licences to be issued on a case by case basis			Mytholm-royd	Critical AP Discharge Rich
8	Mid Calder	Water available for licensing	Discharge rich AP - licences to be issued on a case by case basis			Elland	Critical AP Discharge Rich
9	River Colne	Water available for licensing	13.6 MRF	365	6.7	Colne Bridge	Critical AP
10	Lower Calder	Water available for licensing	Discharge rich AP - licences to be issued on a case by case basis			Methley	Critical AP Discharge Rich

Table 4 HOFs/MRFs for the assessment points of the Aire and Calder CAMS

Assessment Point descriptions

The information below for each AP gives an indication of whether licences will be renewed or granted.

Water available for licensing

The following APs have water available for licensing:

- **AP1 Aire Headwaters**
- **AP2 Upper Aire**
- **AP3 River Worth**
- **AP9 River Colne**

Using Table 4 and AP1 as an example, the following will apply where water is available for licensing:

For AP1, Aire Headwaters, there is water available for licensing. There is 0.8 MI/d available for licensing, providing that the Minimum Residual Flow of 2.3 MI/d can always be met. Following this, further licences will be issued with HOF conditions to protect flows.

This means that for **new** licences:

- There is water available for abstraction;
- We will continue licensing the available resource and implement HOF conditions when necessary to protect flows at critical APs;
- There is a time limit of 31 March 2027.

For **existing** licences:

- There is a presumption of renewal, subject to the other renewal criteria and local considerations.
- Renewals may be subject to minor changes including the addition of water efficiency conditions.

Water available for licensing

NB: These assessment points are discharge rich. There may appear to be water available, however this water could be made up of discharges from existing users. The Environment Agency has no control over their continued operation. This means that the input of water is classed as unreliable and we may not be able to licence it. We also need to be confident that where the ecology has adapted to these higher volumes of water, any abstractions will not cause ecological deterioration.

The following APs have may water available for licensing:

- **AP4 Upper Mid Aire**
- **AP5 Lower Mid Aire**
- **AP6 Lower Aire**
- **AP7 Upper Calder**
- **AP8 Mid Calder**
- **AP10 Lower Calder**

This means that for **new** licences:

- Licence applications in discharge rich APs will be considered on a case by case basis;
- There is a time limit of 31 March 2027, although shorter duration licences may be issued where there is uncertainty around discharge water availability.

For **existing** licences:

- There is a presumption of renewal, subject to the other renewal criteria and local considerations;
- Renewals may be subject to minor changes including the addition of water efficiency conditions.

Heavily Modified Water Bodies

A large number of surface water bodies are designated as Heavily Modified for water resource purposes in the Aire and Calder catchment, as they contain a public water supply reservoir or the flow regime is substantially modified due to reservoir compensation releases. Table 5 contains information on reservoirs within the Aire and Calder CAMS.

The watercourses in the west of the catchment are dominated by impounding reservoirs operated by Yorkshire Water Services Ltd for public water supply. Many of these impoundments discharge compensation water, which makes up the base flow in some headwaters. These discharges, along with effluent discharges from industry and sewage treatment works, may form a significant proportion of the flow during dry periods. In dry summer weather, about 65% of the river flow below Leeds is effluent, much of which is derived from outside the catchment. This has the impact of keeping the lowest flows at a relatively consistent level year-on-year, but poses challenges for pollution control. Table 5 lists the reservoirs in the Aire and Calder CAMS area, whether they issue compensation water and which assessment points are impacted by this artificial modification.

Reservoir name	Compensates/Storage	AP impacted
Winterburn	Compensates	AP1 – Aire Headwaters
Elslack	Compensates & Storage	AP2 – Upper Aire
Embsay	Compensates & Storage	AP2 – Upper Aire
Whinney Gill	Storage	AP2 – Upper Aire
Silsden	Compensates	AP2 – Upper Aire
Keighley Moor	Compensates & Storage	AP3 – River Worth
Watersheddles	Storage	AP3 – River Worth
Ponden	Compensates & Storage	AP3 – River Worth
Lower Laithe	Storage	AP3 – River Worth
Leeshaw	Compensates	AP3 – River Worth
Leeming	Compensates	AP3 – River Worth
Thornton Moor	Storage	AP4 – Upper Mid Aire
Stubden	Storage	AP4 – Upper Mid Aire
Doe Park	Compensates	AP4 – Upper Mid Aire
Hewenden	Compensates	AP4 – Upper Mid Aire
Graincliffe	Storage	AP4 – Upper Mid Aire
Eldwick	Compensates	AP4 – Upper Mid Aire
Weecher	Compensates & Storage	AP4 – Upper Mid Aire
Reva	Compensates & Storage	AP4 – Upper Mid Aire
Gorpley	Compensates	AP7 – Upper Calder
Gorple Upper	Storage	AP7 – Upper Calder
Gorple Lower	Storage	AP7 – Upper Calder
Widdop	Storage	AP7 – Upper Calder
Walshaw Dean Upper	Storage	AP7 – Upper Calder
Walshaw Dean Middle	Storage	AP7 – Upper Calder
Walshaw Dean Lower	Storage	AP7 – Upper Calder
Warley Moor	Storage	AP8 – Mid Calder
Dean Head Upper	Storage	AP8 – Mid Calder
Dean Head Lower	Storage	AP8 – Mid Calder
Castle Carr	Compensates	AP8 – Mid Calder
Ogden	Compensates & Storage	AP8 – Mid Calder
Mixenden	Storage	AP8 – Mid Calder
Withens Clough	Compensates & Storage	AP8 – Mid Calder
Turvin Clough	Compensates & Storage	AP8 – Mid Calder
Baitings	Compensates & Storage	AP8 – Mid Calder

Ryburn	Compensates & Storage	AP8 – Mid Calder
Green Withens	Storage	AP8 – Mid Calder
Booth Dean Upper	Storage	AP8 – Mid Calder
Booth Dean Lower	Storage	AP8 – Mid Calder
Boothwood	Compensates & Storage	AP8 – Mid Calder
Ringstone	Compensates & Storage	AP8 – Mid Calder
Deanhead	Storage	AP8 – Mid Calder
Scammonden	Compensates & Storage	AP8 – Mid Calder
Wessenden Head	Storage	AP9 – River Colne
Wessenden Old	Storage	AP9 – River Colne
Blakeley	Storage	AP9 – River Colne
Butterley	Compensates & Storage	AP9 – River Colne
Deerhill	Compensates & Storage	AP9 – River Colne
Blackmoorfoot	Compensates & Storage	AP9 – River Colne
Bilberry	Storage	AP9 – River Colne
Digley	Compensates & Storage	AP9 – River Colne
Yateholme	Storage	AP9 – River Colne
Riding Wood	Storage	AP9 – River Colne
Ramsden	Compensates & Storage	AP9 – River Colne
Brownhill	Compensates & Storage	AP9 – River Colne
Holmestyes	Compensates	AP9 – River Colne
Boshaw Whams	Compensates	AP9 – River Colne

Table 5 Reservoirs within the Aire and Calder CAMS

Important local features that may affect water availability

European law provides a very high level of protection to two types of designated sites due to their special environment. These are:

- Special Areas of Conservation (SAC), which contribute to biodiversity by maintaining and restoring habitats and species;
- Special Protection Area (SPA), which provides protection to birds and their nests, eggs and habitats.

Ramsar sites and Sites of Special Scientific Interest (SSSI) also carry a high level of environmental importance. Further information can be found in [Section 4.5 – Restoring Sustainable Abstraction](#). Table 6 lists the water related designated sites in the Aire and Calder CAMS area.

Designation	Designated site name
Water related Sites of Special Scientific Interest (SSSIs)	Malham-Arncliffe New House Meadows Pikedaw Calamine Caverns West Nidderdale, Barden & Blubberhouses Moors Stonehead Beck (Gill Beck) Trench Meadows Bingley South Bog South Pennine Moors Leeds-Liverpool Canal Crimsworth Dean Broadhead Clough Withens Clough Denby Grange Colliery Ponds Seckar Wood Fairburn & Newton Ings Mickletown Ings Townclose Hills Roach Lime Hills Eskamhorn Meadows Breary Marsh
Water related Special Areas of Conservation (SACs)	Denby Grange Colliery Ponds Craven Limestone Complex North Pennine Dales Meadows

	North Pennine Moors South Pennine Moors
Water related Special Protection Area (SPA)	North Pennine Moors South Pennine Moors

Table 6 Important features that may affect water availability in the Aire and Calder CAMS

4.2.2 Groundwater

Where groundwater abstractions directly impact on surface water flows, the impact is measured at the surface water AP. Restrictions may be applied to these licences.

On principle aquifers we have divided the area into Groundwater Management Units (GWMUs). We use the information and assessments on these units to determine water availability and licence restrictions.

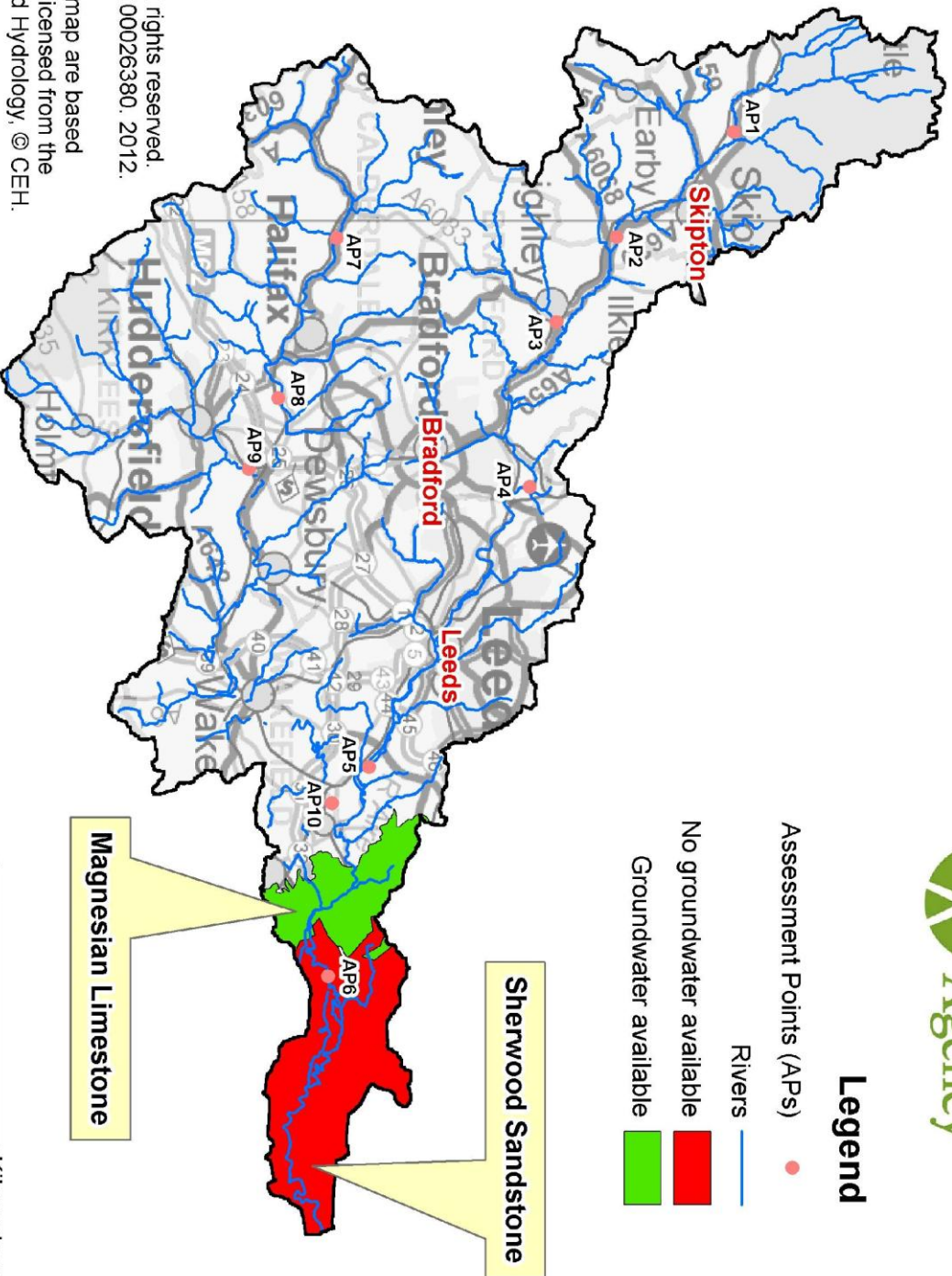
Where groundwater abstractions are likely to impact surface water features, or reduce baseflow to a river, a Hands-Off Level (HOL) condition may be applied to the abstraction. This is a groundwater level below which an abstractor is required to reduce or stop abstraction. There are currently no Hands-Off Level conditions on licences within the Aire and Calder CAMS area. Map 4 and Table 7 summarise groundwater resource availability in this area.

The principle aquifers in the Aire and Calder CAMS area are the Sherwood Sandstone and Magnesian Limestone. These are situated in the east of the area. The Millstone Grit and Coal Measures cover the central and western parts of the area and form secondary aquifers.

Groundwater management unit	Licence restriction
Magnesian Limestone	Groundwater is available
Sherwood Sandstone	Groundwater is not available see Sherwood Sandstone for further details

Table 7 Licence restrictions on groundwater abstractions in the Aire and Calder CAMS area

Map 4 Aire and Calder CAMS Area Groundwater Resource Availability



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Creation date February 2013

Map 4 Groundwater resource availability in the Aire and Calder CAMS area

Magnesian Limestone

The Magnesian Limestone aquifer overlies the Coal Measures and occurs immediately to the east of the Coal Measures in the Castleford area. Extensive faulting and fissuring of the limestone results in the aquifer being vulnerable to pollution. A long history of quarrying the limestone increases this risk because of the reduction in thickness of the unsaturated zone and removal of overburden.

Where drift cover is absent, groundwater is connected to surface waters and the same resource availability may apply to both surface and groundwater. However the River Aire is underlain by thicker drift and alluvium and is unlikely to interact to any great extent with the Magnesian Limestone. This results in the river flows being less sensitive to groundwater abstraction so groundwater is available for licensing in this GWMU.

Sherwood Sandstone

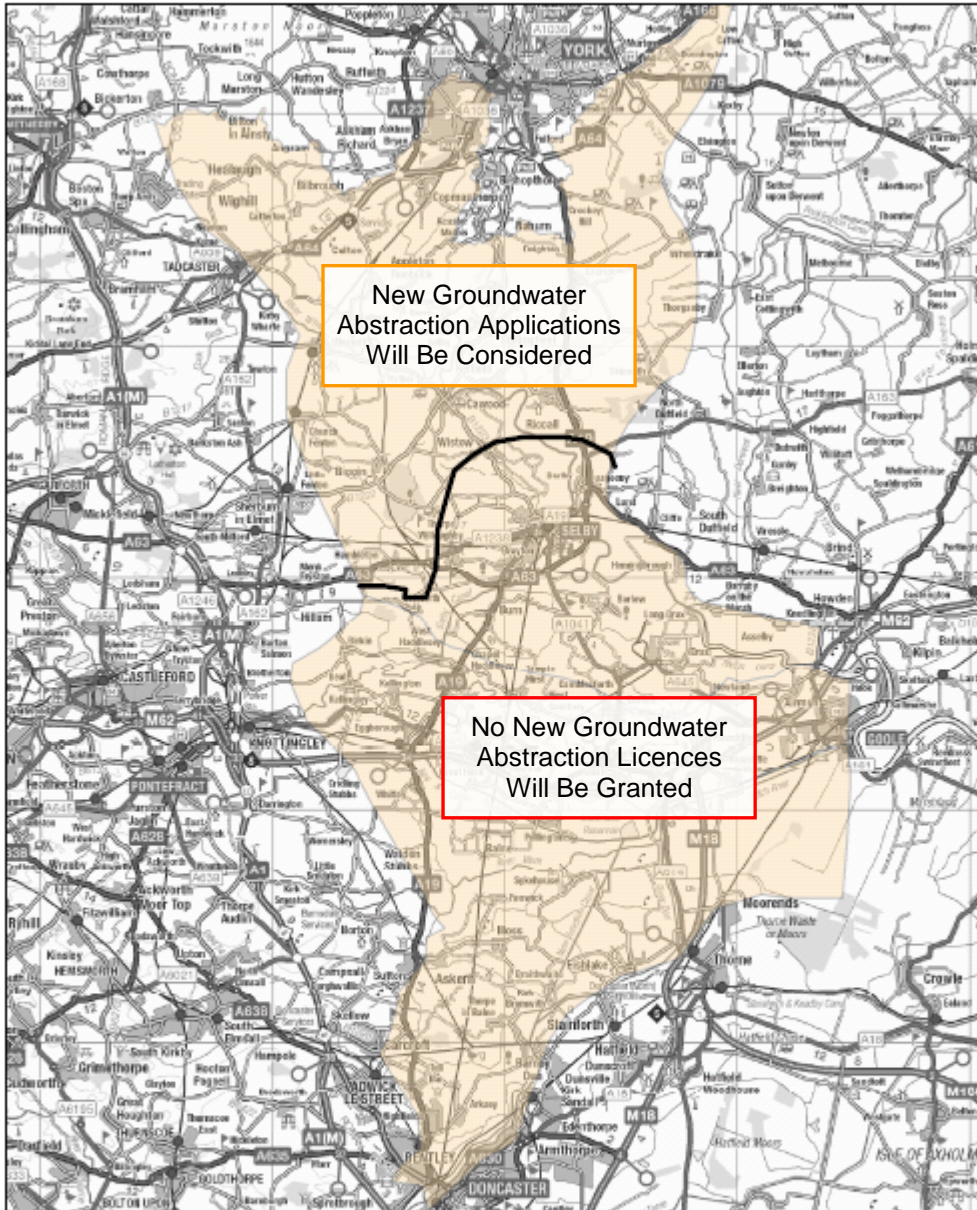
The Sherwood Sandstone provides one of the major groundwater resources of Yorkshire and is extensively developed for public supply. Borehole yields are generally good and may be in excess of 10,000 cubic metres per day.

Natural groundwater flow in the Sherwood Sandstone is generally eastwards. Most of the outcrop area is low-lying, resulting in low hydraulic gradients within the aquifer. The 'key well' monitored site aquifer is at Sykehouse, in the Don and Rother CAMS area to the south of the Aire and Calder CAMS area. This shows a steady decline in levels from when records began in 1971 until 1997. This continual decrease in groundwater levels overshadows seasonal fluctuations and the effects of 'drought periods'. It was therefore concluded that groundwater over-abstraction is the cause of this decline. Groundwater levels displayed general recovery between 1997 and 2001 with a general fall up to 2006.

The latest groundwater level information suggests a slight recovery in groundwater level at Sykehouse, though it is still below sea level. Groundwater levels in this area will be drawn down if new licences are granted – this places a risk on the availability of water to existing licence holders and may lead to the introduction of saline water. We do not consider this to be acceptable because it means the water becomes unfit for most uses and we have a legal duty to protect the rights of existing abstractors. The freeze imposed on issuing new abstraction licences from the Sherwood Sandstone is still in place for the Aire and Calder CAMS area.

Any new licence applications will be assessed on a case by case basis and determined using the Sherwood Sandstone numerical model and not the prescribed CAMS framework. In order to protect groundwater quality in this important aquifer we will not issue licences if the model shows that the abstraction will have negative environmental impacts. Map 5 shows the Sherwood Sandstone aquifer and the line we have modelled as where the groundwater table is at sea level.

Map 5 Sherwood Sandstone aquifer



Legend

- Sherwood Sandstone
- Zero sea level line

0 1.5 3 6 9 12 Kilometres



Creation date Oct 2011

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Map 5 Position of sea level within the Sherwood Sandstone aquifer in the Aire and Calder CAMS area

4.2.3 Estuaries and coastal

The Beal river flow gauging station measures the freshwater flow from the Aire and Calder catchment into the Humber Estuary. This accounts for only about 15% of the total freshwater inflow to the Humber.

Tidal effects are only seen at Beal in exceptional circumstances. The substantial weir at Haddlesey 6km downstream is the normal tidal limit. The maximum value recorded at the level gauge just downstream of the weir is just over 5.2m AOD, a level which occurs roughly once every 15 months. Above this level, the washlands downstream start to fill. Abstraction from tidal reaches makes up less than 1% of the total volume abstracted in the Aire and Calder CAMS area. Licence applications in tidal and estuarine areas will be considered on a case by case basis

4.3 Opportunities for licence trading

We want to make it easier to trade water rights. A water rights trade is where a person sells all or part of their water right, as defined by their abstraction licence(s), to another person on a permanent or temporary basis. In the majority of cases a trade will involve a change in abstraction location and/or use which we will need to approve through the issue or variation of abstraction licences.

In licensing trades, as with new abstraction licences, we need to make sure that we do not cause any deterioration in WFD water body status both within the water body/bodies where the trade will take place or to downstream water bodies. The table below provides a guide to the potential for trading in water bodies of a particular CAMS water resource availability colour, as shown on Map 2.

CAMS water resource availability colour	Our approach to trading
High hydrological regime	Opportunities for trading water rights will be limited.
Water available for licensing	Allow trades of recent actual abstraction and licensed abstraction, but little demand for trading expected within water body as water available for new abstractions.
Restricted water available for licensing	There may be opportunities for licence holders to trade up to their full licensed quantities, but the quantities of water available to trade may be restricted once levels of actual abstraction reach sustainable limits.
Water not available for licensing	We will only trade recent actual abstraction but no increase in recent actual abstraction is permitted in water body. Licensed abstraction will be recovered for the environment.
HMWBs	Opportunities for trading will depend on local operating agreements and local management.

Table 8 Resource availability colours and our approach to licence trading

To find out more about licence trading please go to our [website](#).

4.4 New Authorisations

The Water Act 2003 brought all significant water abstraction under licensing control. This will result in trickle irrigation, dewatering of mines, quarries, engineering works and construction sites, abstractions related to Internal Drainage Districts, navigation abstraction and abstraction for ports and harbour authorities and other local exemptions coming into the licensing regime.

As a result we'll be able to manage water resources more effectively by ensuring that all significant activities influencing the availability of water and its impact on the environment are undertaken in a sustainable manner.

Government are still developing their policies as to how to resolve some of the issues raised during the consultation process. Government will publish their proposals before new regulations are implemented and expect to do this at least three months before commencement so that we can issue guidance to those affected by the changes.

Where we have details of these abstractions we have included them in our assessments to consider how they impact on the catchment.

4.5 Restoring Sustainable Abstraction

Where water abstractions cause or potentially cause actual flows to fall short of the EFIs and result in environmental damage, we may need to change or even revoke existing abstractions in order to achieve a sustainable abstraction regime. Within the Aire and Calder CAMS there are 19 water bodies in which recent actual flows have fallen below the EFI. The abstraction licences within these water bodies that cause these issues are being investigated under the Water Framework Directive (WFD) and may then go forward to become part of the Restoring Sustainable Abstraction (RSA) programme. Investigations into the impact caused by these licences, individually or cumulatively, will result in options being developed with licence holders on how to improve sustainability. Investigations will include a cost/benefit analysis. Information on how licences in the RSA programme are dealt with can be found in our [Step by Step guide](#) on our website.

Investigation of Water Framework Directive water bodies

In addition to the RSA programme, we are investigating whether reduced water flow may be causing problems under the WFD. About four per cent of rivers are failing to support WFD good ecological status due to pressures from over-abstraction.

Habitats Directive

Under the Habitats Regulations we have assessed the effects of existing abstraction licences and will assess new applications to make sure they are not impacting on internationally important nature conservation sites. These sites are known as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). If your current licence has been reviewed under this legislation to assess its impact you will already know about the review. If we haven't contacted you yet then your licence is either not near a SAC/SPA or isn't having an impact on these sites. If our assessment shows that a new application could have an impact on a SAC/SPA we have to follow strict rules in setting a time limit for that licence. These are:

- we may be able to grant the licence but only with a short time limit. This allows us to monitor the impact of the abstraction on a SAC/SPA and change the licence if necessary;
- if we can't determine that your application will not affect the site we have to either put conditions on the licence so that it cannot affect the site or refuse the application. If we grant the licence we may ask you to monitor its impact;
- if our assessment shows that there isn't an impact on the site we will manage the application according to the principles in this document.

Thank you for taking the time to read this Licensing Strategy. If you have any questions about it, or if you want to apply for an abstraction licence or make changes to a licence that you already have, then please contact us:

- by telephone on 03708 506 506
- by email at enquiries@environment-agency.gov.uk
- or visit our website at www.environment-agency.gov.uk

Glossary of terms

Abstraction	Removal of water from a source of supply (surface or groundwater).
Abstraction licence	The authorisation granted by the Environment Agency to allow the removal of water.
Assessment Point Unit	Point at which the flow from upstream catchment is assessed.
Catchment	The area from which precipitation and groundwater will collect and contribute to the flow of a specific river.
Consumptive abstraction	Abstraction where a significant proportion of the water is not returned either directly or indirectly to the source of supply after use. For example for the use of spray irrigation.
Discharge	The release of substances (i.e. water, sewage, etc.) into surface waters.
Environmental flow indicator	Flow indicator to prevent environmental deterioration of rivers, set in line with new UK standards set by UKTAG.
Full licence	A licence to abstract water from a source of supply over a period of 28 days or more.
Groundwater	Water that is contained in underground rocks.
Hands-Off Flow	A condition attached to an abstraction licence which states that if flow (in the river) falls below the level specified on the licence, the abstractor will be required to reduce or stop the abstraction.
Hands-Off Level	A river flow or borehole (groundwater) level below which an abstractor is required to reduce or stop abstraction.
Impoundment	An impoundment is a structure that obstructs or impedes the flow of inland water, such as a dam, weir or other constructed works.
Protected right	Means a right to abstract, which someone has by virtue of the small abstractions exemptions defined in the Water Act 2003 or by virtue of having an abstraction licence. The right protected is the quantity that can be abstracted up to that allowed by the exemption or the terms of the licence. The small abstraction exemptions defined by the Water Act 2003 are for domestic and agricultural purposes (excluding spray irrigation) not exceeding 20 m ³ /d.
Surface water	This is a general term used to describe all water features such as rivers, streams, springs, ponds and lakes.
Transfer licence	A licence to abstract water from one source of supply over a period of 28 days or more for the purpose of; <ol style="list-style-type: none"> 1. transferring water to another source of supply; or, 2. transferring water to the same source of supply, but at another point, in the course of dewatering activities in connection with mining, quarrying, engineering, building or other operations (whether underground or on the surface); without intervening use.
Water body	Units of either surface water or groundwater at which assessments are completed for WFD.

List of abbreviations

AMP	Asset Management Plans
AP	Assessment Point
ASB	Abstraction Sensitivity Bands
AWB	Artificial Water Body
CAMS	Catchment Abstraction Management Strategies
CED	Common End Date
Defra	Department of Environment Fisheries and Rural Affairs
EA	Environment Agency
EFI	Environmental Flow Indicator
FL	Full Licensed (scenario)
GEP	Good Ecological Potential
GES	Good Ecological Status
GW	Groundwater
GWMU	Groundwater Management Unit
HES	High Ecological Status
HMWB	Heavily Modified Water Body
HOF	Hands-Off Flow
HOL	Hands-Off Level
LDE	Level Dependent Environment
MI/d	Megalitres per day
mAOD	Metres above ordnance datum
MRF	Minimum Residual Flow
Q95	The flow of a river which is exceeded on average for 95% of the time
RA	Recent Actual (scenario)
RSA	Restoring Sustainable Abstraction
RBMP	River Basin Management Plans
SAC	Special Areas of Conservation
SPA	Special Protection Areas
SSSI	Sites of Special Scientific Interest
SW	Surface water
UKTAG	United Kingdom's Technical Advisory Group
WB	Water body
WFD	Water Framework Directive
WRGIS	Water Resources Geographical Information System

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