ARUP

# Water Security for Energy and Industry:

## Challenges and Solutions in the Humber, UK

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## Contents Menu

This report has been prepared by Arup on behalf of the Humber Industrial Cluster. Key stakeholders in the development of this report include private businesses which recognise water availability for industrial use is a key risk, including RWE and Phillips 66, and the public sector which is concerned about the impact water scarcity could have on economic investment, including Humber Freeport and North East Lincolnshire Council.

We appreciate the collaboration with CATCH, Anglian Water, Wave Utilities and the Environment Agency in identifying the need and supporting the development to the technical study.

Arup also acknowledges the review provided by Office for Investment; their advice and guidance has been of great value.

And finally, we acknowledge the contribution of our Arup team to this technical study including the energy team, water resources team and local government team.

The Humber region is a critical, nationally significant area for the UK because it is the home of the UK's largest industrial cluster. The Humber Industrial Cluster Plan (HICP) provides a roadmap for how the region will support UK decarbonisation.

The availability of good quality and high volumes of water is key, as water is required to support the construction and operation of energy projects. As a raw ingredient in hydrogen production, consideration for water availability is key, yet it is not yet considered at national policy level and other industrial regions have similar source and supply challenges to the Humber. The Humber will produce up to 30% of the UK's hydrogen production targets, therefore finding a solution is critical.

The future demand for water across the Humber has been quantified. This significant water demand is not likely to be met by current water availability across England, due to growth drivers (industry, population), but also pressing environmental requirements which are resulting in withdrawal of licence abstraction rights.

Long-term large water resources schemes are being considered nationally, but none of these will be ready by 2030 – 2035 and they do not take account of industrial decarbonisation need, so short to medium term solutions by the public and private sectors are required to respond to current and imminent industrial water needs.

The Humber will produce up to

**30%**

of the UK's hydrogen production targets

Defra, Ofwat, the Environment Agency (EA) and Drinking Water Inspectorate (DWI) published a joint letter in 2018 that calls for “greater coordination of water resource management…to meet the challenges we face” through regional water resources planning.

The Humber Regional Water Resources Groups are responsible for developing regional plans, yet representation and participation of key water-using sectors (such as energy, industry, agriculture) varies significantly from one regional water resources group to the next.

The water companies across the Humber namely Anglian Water, Yorkshire Water and Severn Trent Water have a responsibility to supply water for domestic and non-domestic use (although their legal obligations relate to domestic use). Each has developed and published their investment plans a 2024 Water Resources Management Plan that describes its investment plans.

Traditionally industry would consider applying for a water abstraction licence as these are widely used across the region. Yet these are being reduced, recalled or time limited due to environmental concerns, and this is impacting availability of water for the domestic and non-domestic sectors.

The study recognises water scarcity is a regional challenge that requires support and commitment from local, national government and private business.

Seven opportunities have been identified to help the Humber secure water; these include:

1. Increase engagement of industry in development of Regional Water Resources Plans
2. Review abstraction policy and management through engagement with the Environment Agency
3. Develop a water scarcity intervention strategy with the EA, local Authorities, DLUHC and Defra
4. Identify new water sources from outside of the traditional water sector
5. Explore water trading between industries
6. Unlock unused abstraction licences
7. Improve holistic understanding of water availability

The study concludes that if water scarcity is addressed from a strategic level, tactical level and solution identification level then the Humber will be able to influence the future availability of water and a secure decarbonised future.

# 1. Introduction

The Humber is a critical, nationally-significant industrial area for the UK

# Why the Humber and adjacent areas are nationally significant

The Humber is a critical, nationally-significant industrial area for the UK, with the highest carbon emissions in the UK and it is important for energy production, iron and steel production, lime and glass refining, chemical manufacturing and  food products, among others.

The Humber Estuary is connected to at least 25% of the UK's energy production, via electricity generation, refined fuel and natural gas inputs. As such there is significant investment in the sector within this region, particularly in the South Humber area, and further inland where power stations such as Keadby and Drax, for example, are located.

The Humber is also transitioning to a key hydrogen-generating region of national significance. The aspiration is for up to 30% of the UK's hydrogen production targets to be produced in the Humber, through both blue and green hydrogen production.

The area is therefore a key location for UK government ambitions for decarbonisation and net zero target achievement. To assess the water issues appropriately, this study has taken as its boundary the water company and local authority boundaries shown in Figure 2

The Humber Estuary is connected to at least

**25%**

of the UK's energy production


**Figure 1**
The UK's Largest Industrial Clusters by Emission (EA Study, 2022)


**Figure 2**
Local authorities included in baseline study area

# 2. The Challenge

Water demand for industry and energy use in the South Humber alone is expected to increase significantly over the next few years.

# The water demand problem in the short to medium term

Water demand for industry and energy use in the South Humber alone is expected to increase significantly over the next few years.

Estimates vary but all stakeholders agree on the significant demand. The water company plans describe projected additional demand within the next five to 15 years of the order of 60 Ml/d. This is a combination of potable water, non-potable water and cooling water demand. Estimates for the wider area may add another 44 – 61 Ml/d[1].

However, estimates from the Environment Agency[2] place current demands in the South Humber at 204 Ml/d, before decarbonisation, with demand growing by more than 180 Ml/d. To the north of the Humber, demand is expected to grow by 12% to 119 Ml/d (compared to 160% in the South Humber).

Such significant water demand is, however, not likely to be met as water availability across England, particularly in the east and northeast of England is under severe pressure. This is due to both growth drivers (industry, population), but also pressing environmental requirements which are resulting in withdrawal of licence abstraction rights.

Anglian Water, which currently services the South Humber industrial demand, has stated that it has less than 1 Ml/d extra capacity available for non-household water demand, including industrial and energy needs in the short term. Future engagement with Severn Trent Water and Yorkshire Water could verify our understanding of the future industrial demand in their adjacent supply areas.

Long-term large water resources schemes are under development nationally, including the proposed Lincolnshire Reservoir being developed by Anglian Water, but none of these will be ready by 2030 – 2035, so short to medium term solutions by the public and private sectors are required to respond to current and imminent industrial water needs.

To the north of the Humber, demand is expected to grow by

**12%**

Compared to

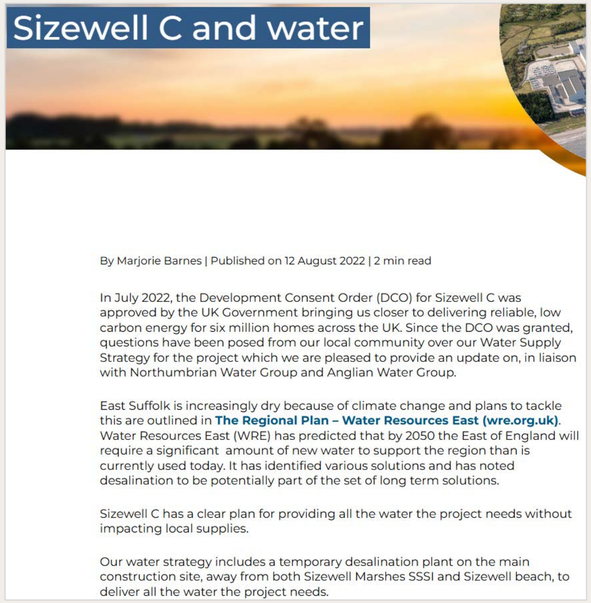
**160%**

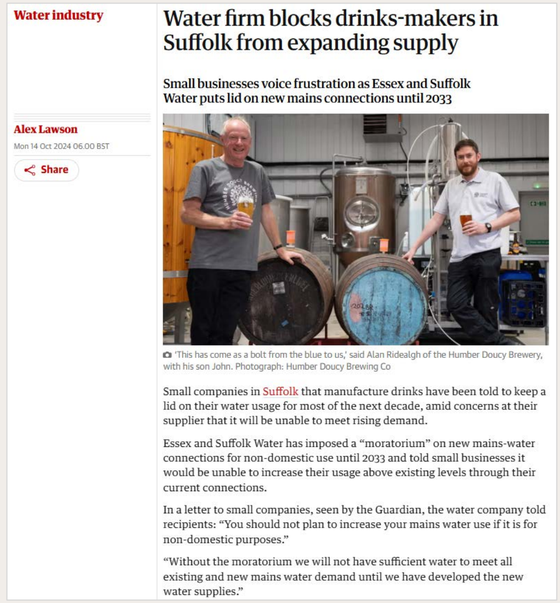
in the South Humber

Such significant water demand is, however, not likely to be met as water availability across England, particularly in the east and northeast of England is under severe pressure.

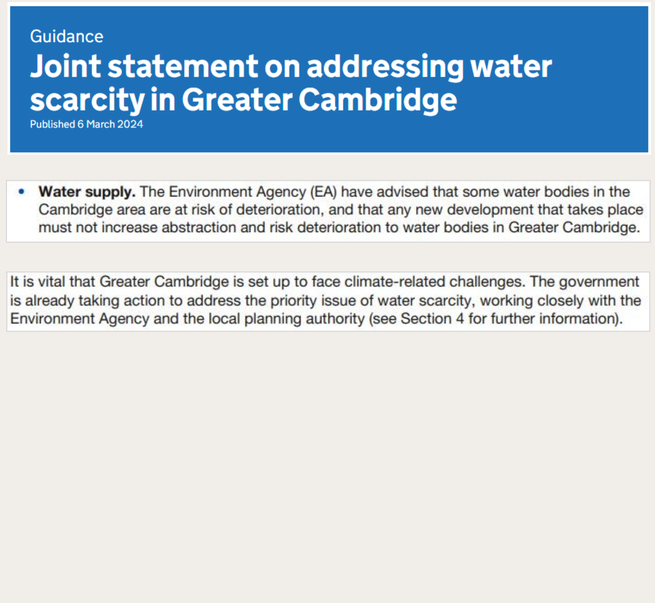
1 Severn Trent Water estimates 29 Ml/d increase in WRMP24, plus 17 Ml/d new requests in 2024. Yorkshire Water's hydrogen scenario estimates up to 15 Ml/d.
2 Environmental Capacity for Industrial Clusters, Humber Pathfinder Project, Version 3, April 2022

# An emerging national issue








**Arup composite**
Composite image showing how water availability is affecting business, industry and national investment and development.

# Governance structure for Industrial Water supply

Regulation of the water industry in the UK is well established and there are several key parties associated with the supply of water and the development of strategic water assets. Current governance is focused on either flood resilience or public water supply, and no one company is responsible for integrated water planning or supplying water to industry.


The diagram above shows a simplified funding/governance structure for key parties.

## Environment Agency

The environmental regulator of the water and sewerage sector. They are the principal adviser to the government on the environment, and the leading public body protecting and improving the environment of England. They work in partnership to reduce flood risk, promote sustainable development and secure environmental and social benefits.

*Water can be sourced through the Environment Agency through an abstraction licence, this can be from a local water or ground source. But they have no obligation to provide water for industrial demand nor consider how flood defences could be used as an asset to support industrial water need.*

## Water Resource Planning Groups

Responsible for regional planning and assessing the feasibility of regional and inter-regional solutions in the forthcoming regulatory period and beyond.

This includes considering strategic transfers and strategic water storage infrastructure.

*These groups do not supply water but are responsible for developing strategic, multi-sector plans. It is important that they understand the future demand across all sectors.*

## Regulated water companies

Regulated water companies in the UK are responsible for providing household (domestic) and non-household (non-domestic) consumers with water supply, sanitation and drainage services. Termed public water supply (PWS), their services are the main route through which water services are provided.

*Water can be purchased from a water company and sourced through their utility network, they supply based on a water demand hierarchy and prioritise domestic customers and communities first.*

# 3. The Supply Context

It is clear from the current makeup of the regional water resources groups that not all water use sectors are represented or adequately represented.

# Regional water resource plans

## Regional water resources groups commit time to regional planning and development of regional and inter-regional solutions

In 2018, Defra and the water sector regulators, Ofwat, the Environment Agency (EA) and Drinking Water Inspectorate (DWI) published a joint letter[1] calling for ‘greater coordination of water resource management…to meet the challenges we face’ through regional water resources planning.

The letter required water companies to commit time and money to regional planning and assessing the feasibility of regional and inter-regional solutions in the forthcoming regulatory period. This includes considering strategic transfers and strategic water storage infrastructure.

Since then, regional water resources plans have been developed, which begin to address the environmental and water resource needs of specific regions.

The relevant plans for the study area are published by:

**Water Resources East (WRE):**

Formed by Anglian Water in 2014, but is now an independent, not-for-profit organisation with over 200 members, including Energy UK (and individual energy companies), NFU, local authorities and IDBs, among others.

**Water Resources North (WReN):**

Core companies are Northumbrian Water, Yorkshire Water, and Hartlepool Water (part of Anglian Water), but they aim to involve anyone with an interest in the region’s water resources. Stakeholders include Energy UK, Uniper, SSE, NFU and CRT.

**Water Resources West (WRW):**

Core members are South Staffordshire Water, United Utilities, Dŵr Cymru (Welsh Water), Severn Trent and Hafren Dyfrdwy. Associate members include the National Farmers Union, Energy UK and Confederation of Paper Industries.

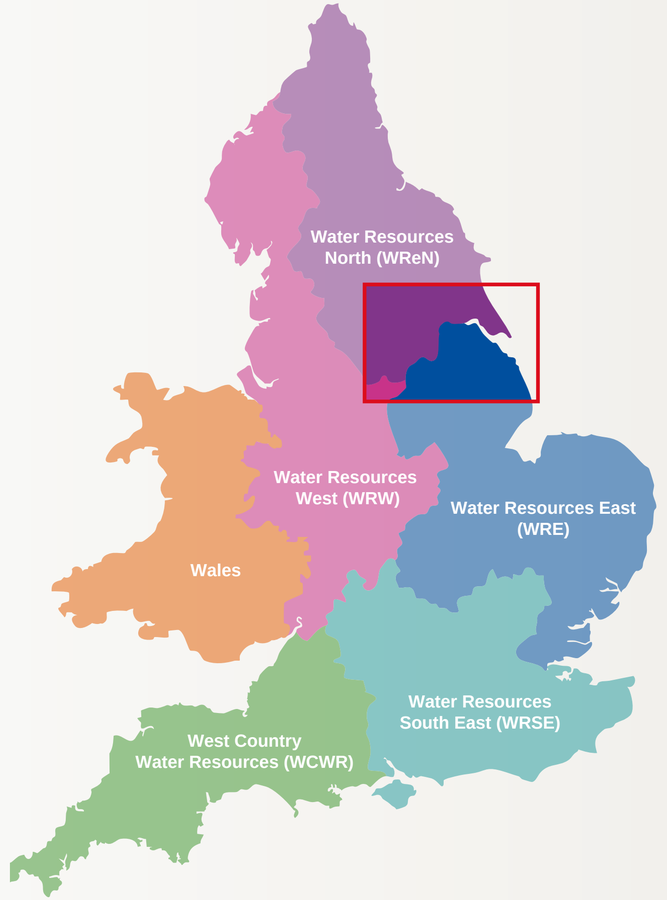



**Figure 3**
England & Wales Regional Water Resource Groups and baseline study area

1 https://www.ofwat.gov.uk/wp-content/uploads/2018/08/Building-resilient-water-supplies-letter.pdf

# Influencing Regional Water Resources Planning

It is clear from the current makeup of the regional water resources groups that not all sectors are represented or adequately represented.

While the agriculture sector and energy sector are well-represented in WRE, WRW and WReN, industry is not.

For example, in its consultation response to WReN's draft water resources plan, the EA highlighted that, while there was evidence of engagement with the energy sector, there [was] limited evidence of engagement with the industrial sector.

The EA further stated: "This is concerning, given the importance of industry in the region, potential growth and the need to decarbonise in line with net zero objectives".

In this round of plans, most regional groups have engaged with the three "top" non-domestic water sectors which are: energy, agriculture and navigation. Industry is viewed as a smaller proportion of the non-domestic water demand scenario.

A 2024 study by Arup[1] found that representation and participation of other key water-using sectors (such as energy, industry, agriculture) varied significantly from one regional water resources group to the next. Funding for other sectors was also considered a barrier to participation; most of the regional water resources group's funding is through the water companies and does not cover other sectors.

However, in some instances participants were able to self-fund: Energy UK and the Joint Environment Programme, for example. Both represent energy sector interests and overcame the funding barrier to engagement with the regional water resource groups and participated in the development of the plans.

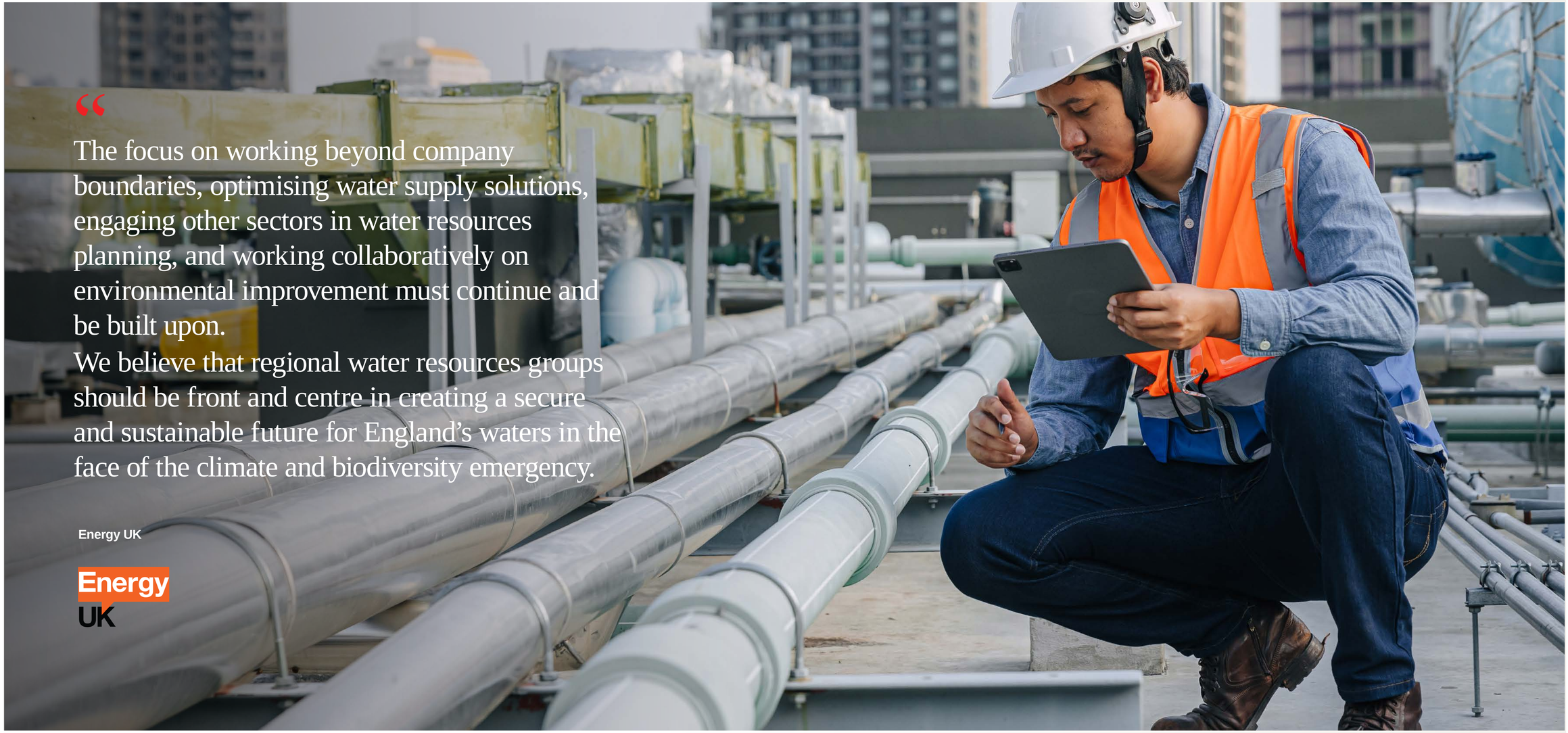
We note that most Humber Industrial Cluster members are also members of Energy UK.

For Energy UK, members contribute to a central fund and 'projects' are submitted and voted on. One of the projects the sector funded in the latest (WRMP24) round of regional plans was to fund a representative to engage with all regional water resource groups on behalf of the sector.

In January 2023, Defra and the water sector regulators issued a follow up letter[2] in support of regional planning, noting that significant progress has been made but, further collaboration cross sectors was required.

> "This is concerning, given the importance of industry in the region, potential growth and the need to decarbonise in line with net zero objectives.
>
> **Environment Agency**

1 Arup, Review of Funding Options and Potential for Multisector Water Resource Planning in Regional Groups, January 2024
2 https://wre.org.uk/wp-content/uploads/2023/02/2023-01-11-New-round-of-regional-planning-joint-letter.pdf




1 Arup, Review of Funding Options and Potential for Multisector Water Resource Planning in Regional Groups, January 2024
2 https://wre.org.uk/wp-content/uploads/2023/02/2023-01-11-New-round-of-regional-planning-joint-letter.pdf

# Extract on non-domestic water supply abstraction from “Summary of Regional Plans for Water Resources, November 2022”

This extract from the Summary of Regional Plans for Water Resources was published following the completion of the first draft regional water resource plans.

All regions have engaged and collaborated with non-public water supply sectors in the development of their plans. This marks a major step forward in the water resources planning process, and the appreciation of the requirements across multiple sectors has greatly increased.

Solutions to meet environmental drivers go beyond developing options that benefit the supply-demand balances.

Activities in the regional planning organisations also include nature-based solutions to benefit the environment, such as catchment management or biodiversity enhancement schemes.

It is clear that power and agriculture sectors are concerned with the impacts of reduced abstractions on energy and food-security. The Environment Agency will continue to work with and review the licences across sectors over time.

Many farmers rely on single water sources and are already facing challenges during dry weather. Likewise, the power sector is dependent on abstractions and if these are reduced and capped, their assets could be stranded. Hence, although some impacts may be localised, their magnitude could be high.

These issues are being explored in parallel to public water supply by all regions, recognising that solutions to address them will be developed in time, as uncertainties are resolved.

Given the lack of long-term water resource planning historically within many sectors, regional groups plan to build upon this progress through into the next round of regional plans for completion in 2029. This will be supported by the Environment Agency’s update of the National Framework, to provide greater definition on the framework and approaches required for multi-sector planning.

This provides a good overview of the plans and future direction of travel.

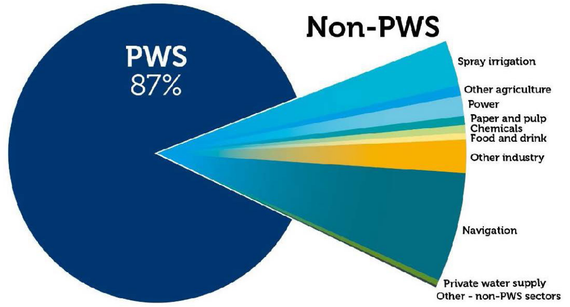



**Figure 4**
Current public water supply and non-public water supply abstraction across all regions (Summary of Regional Plans for Water Resources, November 2022)

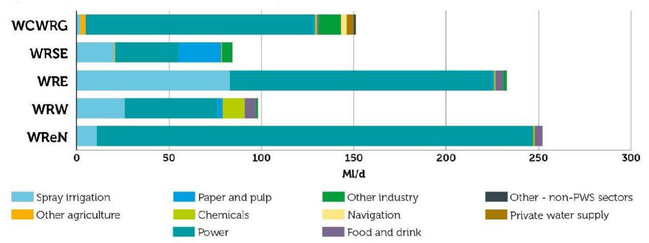



**Figure 5**
Increases to non-public water supply abstraction forecasts to 2050 (Summary of Regional Plans for Water Resources, November 2022)

# Water company plans – Anglian Water

Anglian Water (AW) services a proportion of the South Humber industrial demand, and anticipates it now has less than 1 Ml/d extra capacity available for non-domestic water demand, including industrial and energy needs in the short term.

Non-domestic consumption accounts for approximately 27% of the company's overall demand. It deems such demands "difficult to forecast due to lack of visibility of developers' plans as well as the variability of the wider socio-economic environment".

AW notes that non-domestic demand has been historically relatively stable, allowing it to accommodate new requests using available headroom. However, it notes a step change in 2023, with a large increase in requests for non-domestic demand, with over 30 Ml/d of new water needed.

This increase in demand is attributed to:

1. Loss of businesses' own licences due to licence capping
2. Relocation of production (e.g. due to Brearit)
3. Hydrogen and carbon capture, use and storage (CCUS) schemes to meet UK net zero goals.

Large water resources schemes, such as the proposed Lincolnshire Reservoir (2039) and Fens Reservoir (2036), are in development. None will be ready in the short to medium term timeframe required by urgent present and imminent industrial water needs, including water for hydrogen.

AW's WRMP24 plan includes a proposal for a 50 Ml/d desalination plant at Mablethorpe specifically for non-domestic, industrial use by 2035. It has received funding for studies to start between 2025 and 2030 to accelerate delivery.

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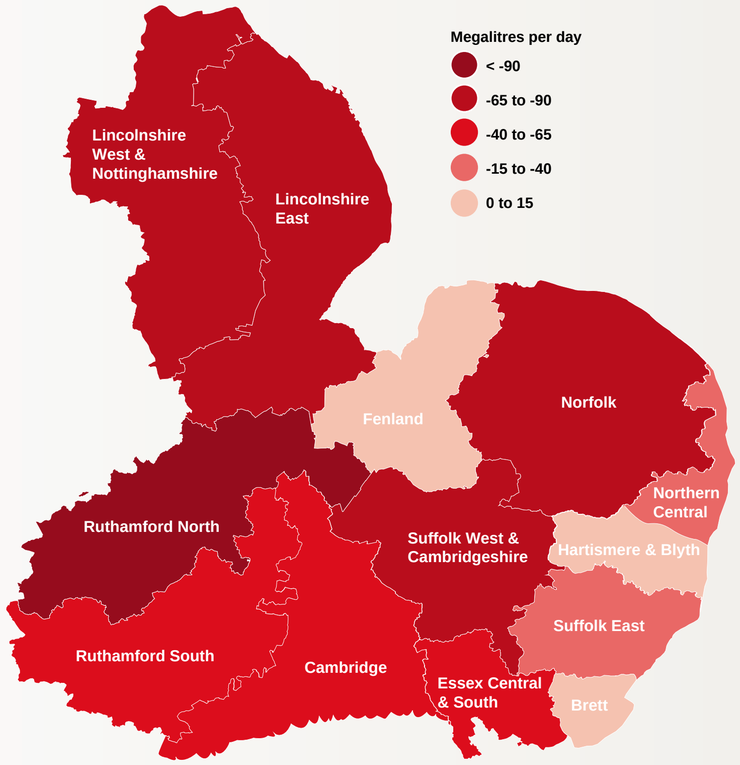



Anglian Water, WRMP24

**Figure 6**
Anglian Water's water deficit map by water resource zone

# Water company plans – Yorkshire Water

Yorkshire Water Services (YWS), which services the North Humber area, projects a gradual decline in existing non-domestic demand of 18 Ml/d between 2025 and 2050.

It's latest water resources plan (WRMP24) states that this is driven primarily by:

– a fall in "non-service sector demand", and

– increased water use efficiency by non-domestic water users.

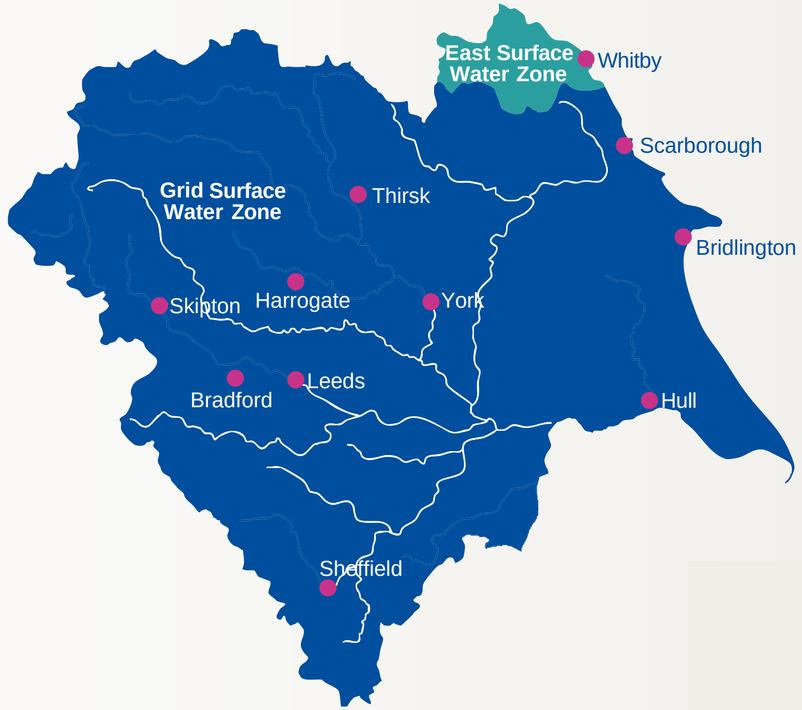
Nevertheless, YWS is still planning to increase its overall supply by up to 140 Ml/d by 2040/50 to meet project growth in domestic demand and to meet resilience targets.

Despite the projected fall in non-domestic demand (small businesses) YWS has modelled scenarios that allow for the growth in non-domestic demand over time,
based on its understanding of likely new large commercial users.

The company states it has received some specific requests for a supply increases, including one from an existing soft drinks company for an increase of 3.45 Ml/d to be available by 2025 in North Yorkshire.

More importantly, YWS has considered the additional need for water due to the emerging hydrogen production sector as a scenario in its plan. This scenario assumes an additional 15 Ml/d is required by 2027/28 to support this sector. However, this scenario is not part of the company's core delivery plan. The company states that any new large user of water could "significantly impact [its] ability to deliver overall demand reduction [targets to which it has committed]".

YWS' opinion is that future water needs for hydrogen are "highly uncertain and dependent on policy delivery uncertainty". It also notes that there is uncertainty as to where hydrogen production will be located and when production may start. YWS, therefore, believes water for hydrogen will be a focus for the next round of regional plans to improve understanding of the growth in hydrogen requirements, and how that will impact competing requirements for water resources. This will inform its WRMP29, which is already in development, and should be done in concert with WReN.




Yorkshire Water, WRMP24

**Figure 7**
Yorkshire Water's water resource zones

# Water company plans – Severn Trent Water

Severn Trent Water (STW) lies to the west of AW, its Nottinghamshire, Newark and Strategic Grid water resource zones being the ones most relevant for this study.

The Strategic Grid resource zone will go into deficit by 13 Ml/d by 2030. STW plans to increase supply between 2025 and 2040 by increasing the capacity of reservoirs and treatment plants, building new reservoirs and treatment plants, transfers to areas of need and changes to import and export arrangements.

– Between 2025 and 2030: +151 Ml/d

– Between 2030 and 2035: +36 Ml/d

– Between 2035 and 2040: +25 Ml/d

For non-domestic demand, STW intends to help 3,000 businesses reduce their water, within the context of the Government's non-household interim reduction target of 9% by 2038 compared to 2019/20 baseline. STW aims to achieve the 9% target by 2038 15% by 2050.

STW intends to help

**3,000**

businesses reduce their water by 2038

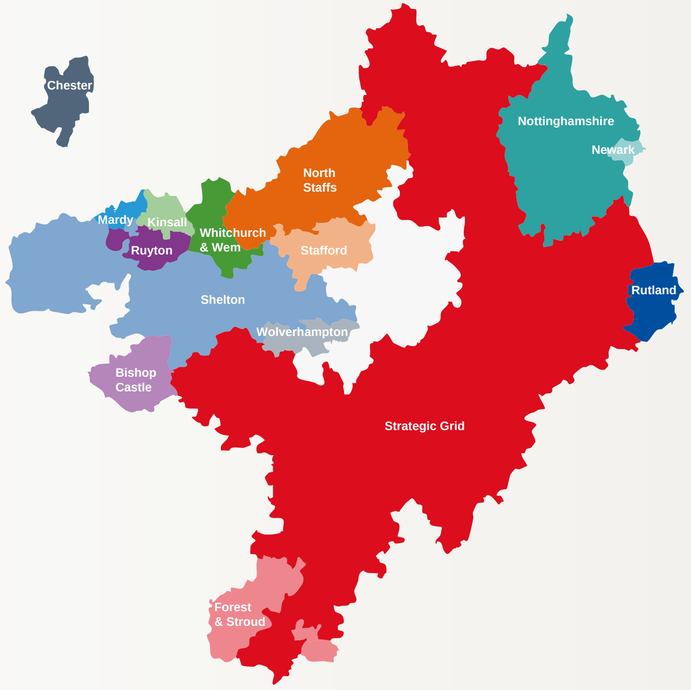
STW forecasts non-domestic demand will grow by 29 Ml/d from 2025/26 to 2038. It has included in its plan a non-domestic demand reduction profile which will require all non-domestic demand to provide 9% and 15% efficiencies on future growth, by 2038 and 2050 respectively.

STW's plan notes that this is to "ensure [it is] not presenting a scenario of stifled growth in the Midlands which goes against the 'levelling up' ambitions of Government".

It also notes that "there is volatility in [its] underlying growth forecasts, and being able to support non-household growth is important for [its] region and UK Plc".

STW also highlights that it has received new water supply enquires in 2024 for additional water supply to new commercial ventures, adding up to 17 Ml/d that are not accounted for in its plans.

Finally, STW notes that it would only need a small number of such requests over the next five years to erode its supply headroom (forecast surplus).




Severn Trent Water, WRMP24

**Figure 8**
Severn Trent Water's water resources zones

# Water resource availability for abstraction

This section provides relevant context with regard to surface water and groundwater availability within the study area.

It is clear from the regional water resources plans and company water resources management plans that water resource abstraction licences are being reduced, recalled or time-limited. The impact of the reduction in water abstracted is most evident for domestic (public) water supply, which accounts for 70% of abstraction.

Water supply abstraction licence reductions for environmental reasons are referred to as Sustainability Reductions. These reductions are also likely to apply to non-domestic abstraction licences, particularly where they have not been used recently or where the licenced amount is rarely used

For the water sector, further abstraction reductions are required over the long-term. These are referred to as 'environmental destination' requirements, which take a longer-term planning approach to help drive cost efficient water resources solutions and avoid environmental damage before it occurs.

In order to examine the availability of water for new abstraction, an overview of the baseline information on water resource availability and abstraction reliability is presented in this section. Figure 9, for example demonstrates that the majority of river catchments in the study area have reliable abstraction less than 50% of the time, with significant areas in the South Humber having reliable abstraction less that 30% of the time.

The majority of river catchments in the study area have reliable abstraction less than

**50%**

of the time

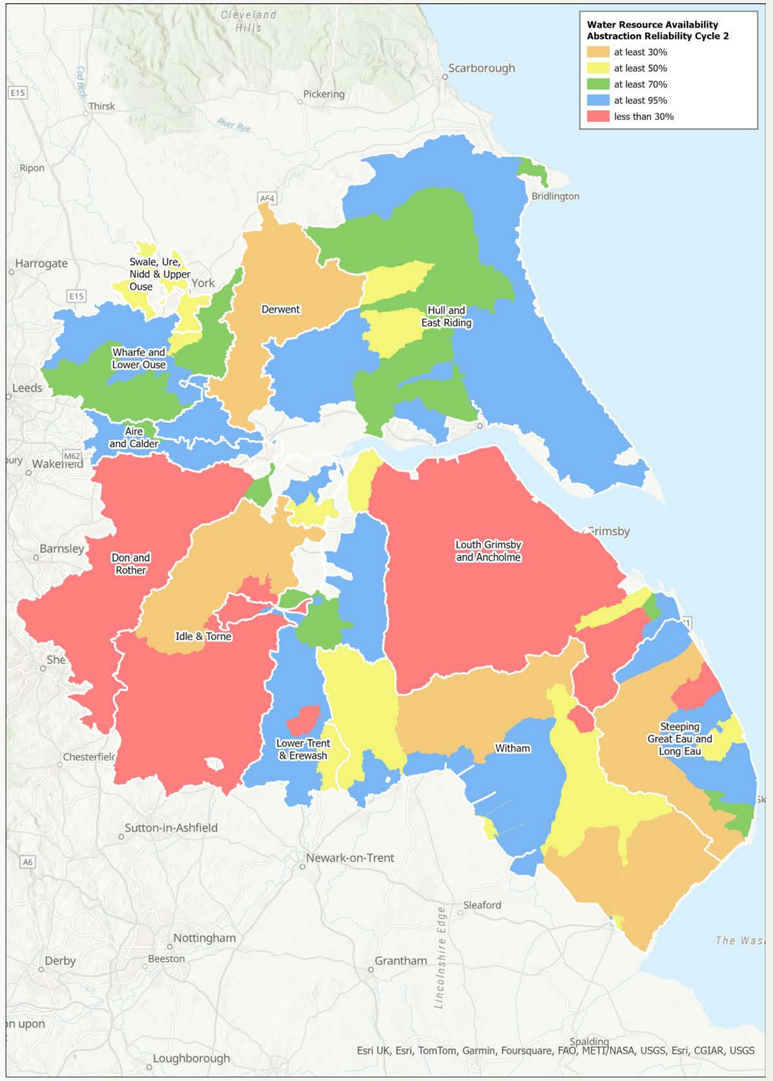



**Figure 9**
Water resource abstraction availability and reliability by river catchment (Environment Agency data, June 2024)

# Summary of Abstraction Licencing Strategies (ALS)

Abstraction Licencing Strategies (ALS) are the official way in which the EA provides information on water availability for abstraction.

They were formerly called Catchment Abstraction Management Strategies (CAMS), and are developed at major river catchment level, providing a water availability rating for both surface water and groundwater availability:

– Water available

– Restricted water available

– Water not available

Licencing strategies undergo periodic updates; the latest publicly available version for the relevant catchments has been reviewed.

The relevant catchments are:

– South Humber - Grimsby, Ancholme & Louth ALS (March 2020)

– North Humber - Hull and East Riding ALS (February 2013)

– The adjacent table summarises the water availability situation, based on the above licencing strategies. The maps from each ALS are provided in Appendix B for reference.

It should be noted that the Hull & East Riding ALS likely shows outdated information and that an update is probably in development.

| Grimsby, Ancholme & Louth ALS | Hull and East Riding ALS |
|---|---|
| Updated in 2020, so the available information is reasonably recent. | Last updated in 2013, so the information is likely to be outdated. It is assumed that a new assessment is being undertaken or will be undertaken imminently by the EA to bring the information up to date. |
| At Q30 (high flow), surface water is mostly restricted or not available for abstraction. Only a small sub-catchment has water available for abstraction. | At Q30 (high flow), surface water is mostly available with pockets that are restricted or not available for abstraction. However, based on recent communications from the EA, this is unlikely to be the actual situation. |
| At Q95 (low flows), surface water is primarily not available for abstraction, or restricted. | At Q95 (low flows), surface water is still available, with more areas restricted or not available (about 50%) of catchment, As noted above, recent communication indicate that the actual situation indicates that there is no water available for abstraction at low flows. |
| Surface water consumptive abstraction is available 50% of the time or less; for the majority of the catchment, however, consumptive abstraction is available less than 30% of the time. | Surface water consumptive abstraction is mostly available 50% of the time or more; in some areas, however, consumptive abstraction is available less than 30% of the time. |
| Groundwater abstraction is mostly restricted or not available. | Groundwater abstraction is mostly restricted or not available. |

**Table 1**
Summary of surface water and groundwater abstraction availability and reliability by licencing catchment (Environment Agency ALSs, March 2020, February 2013)

# Existing abstractions in the study area

A high-level assessment of existing abstraction licences in the study area (2021) data demonstrates the number and range of abstractions that are currently licenced.

They cover three types of water sources:

– Surface water (SW)

– Groundwater (GW)

– Tidal water (TW)

The primary uses are:

– Agriculture

– Energy production

– Water supply

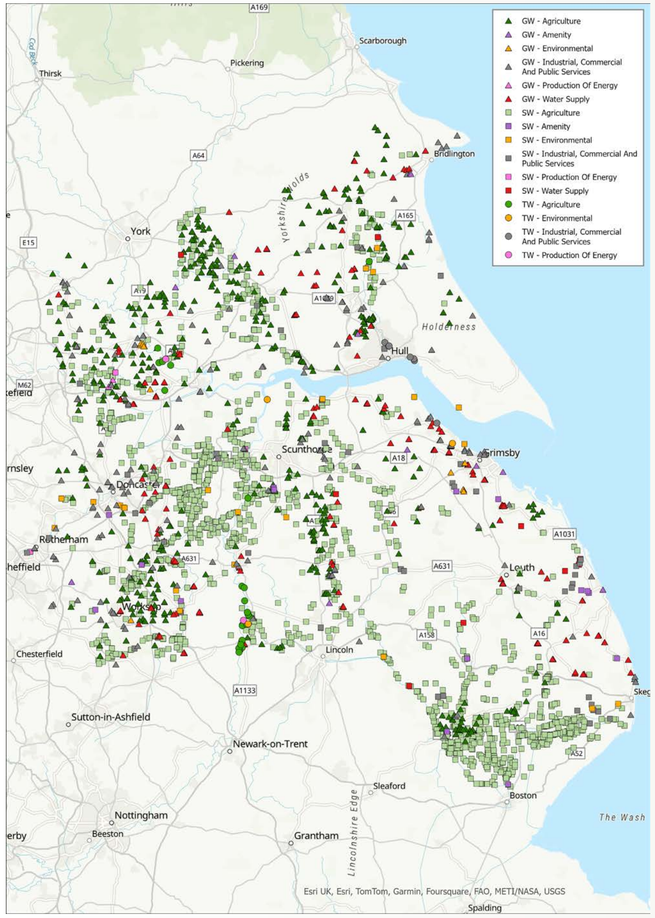
– Industry, commercial and public services

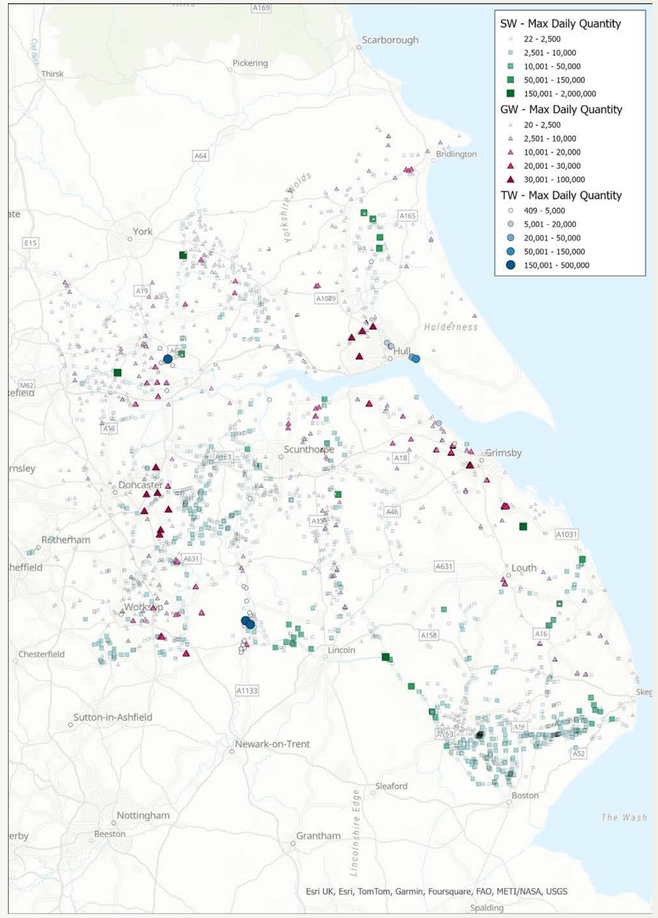
– Environment, and

– Amenity

The use types are both consumptive and non-consumptive, with daily licenced abstraction quantities ranging from 20 $m^3$/d (0.2 MI/d) to 2 million $m^3$/d (2,000 MI/d). Utilisation of existing licences needs to be assessed to determine how much spare capacity, if any, exists.

The licence and abstraction volumes are summarised by use type on the following page, for reference.



# Existing abstractions by category

| Source Types | Sum of Max Annual Quantity ($m^3/yr$) | Sub Totals by Source (Max Annual Quantity, $m^3/yr$) | Sum of Max Daily Quantity ($m^3/d$) | Sub Totals by Source (Max Daily Qty, $m^3/d$) |
|---|---|---|---|---|
| GW - Agriculture | 50,803,062 | 1,333,101,253 | 921,204 | 5,198,447 |
| GW - Amenity | 378,075 | | 6,346 | |
| GW - Environmental | 29,162,634 | | 85,942 | |
| GW - Industrial, Commercial And Public Services | 181,998,459 | | 722,722 | |
| GW - Production Of Energy | 6,100,000 | | 27,400 | |
| GW - Water Supply | 1,064,659,023 | | 3,434,834 | |
| SW - Agriculture | 216,268,765 | 1,199,131,923 | 3,718,971 | 7,447,611 |
| SW - Amenity | 2,285,841 | | 13,650 | |
| SW - Environmental | 68,985,749 | | 256,019 | |
| SW - Industrial, Commercial And Public Services | 45,272,414 | | 293,437 | |
| SW - Production Of Energy | 626,976,650 | | 2,211,526 | |
| SW - Water Supply | 239,342,504 | | 954,008 | |
| TW - Agriculture | 813,887 | 665,306,527 | 45,381 | 2,667,814 |
| TW - Environmental | 18,395,000 | | 187,296 | |
| TW - Industrial, Commercial And Public Services | 44,519,831 | | 130,614 | |
| TW - Production Of Energy | 601,577,809 | | 2,304,524 | |
| **Grand Total** | **3,197,539,703** | **3,197,539,703** | **15,313,873** | **15,313,873** |

# 4. The Demand Context

Water is a critical resource for industrial processes from cooling to solvent production and from chemical reactions to energy generation.

# Industrial water demand

## Water is a critical resource for industrial processes from cooling to solvent production and from chemical reactions to energy generation.

There is significant existing water demand associated with industry. Some of this demand is met through own licences and direct abstraction, while the rest is met by water companies. In both these instances, the previous chapter demonstrates that there is very little room for manoeuvre in terms of both new or additional abstractions, and water company supplies.

In addition, climate change is expected to have an impact on both water availability and water demand. For example, rainfall in the east of England is predicted to reduce by 34% in summer by 2050 (EA, 2019) increasing the frequency of low flows and droughts.

Water demand for industrial use is predicted to increase in the supply area, in some cases significantly.

Recent estimates are that:

– Water demand in South Humber is forecast to increase by 181Ml/d in the worst-case scenario (WRE, 2022).

– Water demand from industry and energy in North Humber is projected to increase by 16 Ml/d (WReN, 2022).

Whilst there may be some surplus in North Humber region South Humber is already at capacity.

The rate of increase within the next few years is expected to be significant due to local authority investment and development aspirations.

The rate of change will also be driven by energy and decarbonisation projects for the Humber Industrial Cluster, particularly the proposed production of hydrogen.


**The Humber's Roadmap for Industrial Decarbonisations, 2024**
Humber Energy Board

**-34%**
Summer rainfall in East England[1]

**+160%**
Water demand in South Humber by 2050[2]

**+13%**
Water demand in North Humber by 2050[3]

1 Environment Agency. 2019. Adaptation to climate change risk assessment worksheets for river basin. 2
2Water Resources East. 2022. Emerging Water Resources Regional Plan.

# Water demand for energy: carbon capture and hydrogen

The Humber Industrial Cluster contributes 12.4 million tons (Mt) to the UK's 33.2 Mt total annual industrial carbon dioxide emissions.

To achieve the net zero targets for the Humber cluster, carbon capture and low-carbon hydrogen production are expected to play a significant role.

These processes are water intensive. According to the Humber Industrial Cluster Plan Water Study (2022), by 2040, water demand due to carbon capture and hydrogen production could account for an additional 13.42 to 224.11 Ml/d.

Anglian Water's water resources plan for 2025 – 2050 includes 60 Ml/d of forecast non-potable demand for future hydrogen production and carbon capture in the South Humber Bank water resource zone.

Yorkshire Water has forecast a scenario where 15 Ml/d is required for hydrogen production.

Severn Trent Water has not forecast the possibly of increased demand for hydrogen production and carbon capture, but expects increased non-domestic demand by 2038 of at least 29 Ml/d.

The Humber region contributes over

**1/3**

of the UK's industrial CO2 emissions

**12.6**

litres of water used to produce 1kg of blue hydrogen

**30**

litres of water used to produce 1kg of green hydrogen


**The Humber's Roadmap for Industrial Decarbonisations, 2024**
Humber Energy Board

Environment Agency. 2022. Environmental Capacity for Industrial Clusters report.
Anglian Water. 2024. Water Resources Management Plan.

# Contextualising water sector and industrial water demand projections

Water companies in England and Wales have a responsibility to supply water for domestic and non-domestic use, although their legal obligations relate to domestic use only.

Anglian Water, Severn Trent Water and Yorkshire Water have made projections for non-domestic consumption in their current plans.

However, when contextualised against the estimated baseline and future industrial demand for North and South Humber (HCIP study), it becomes clear that:

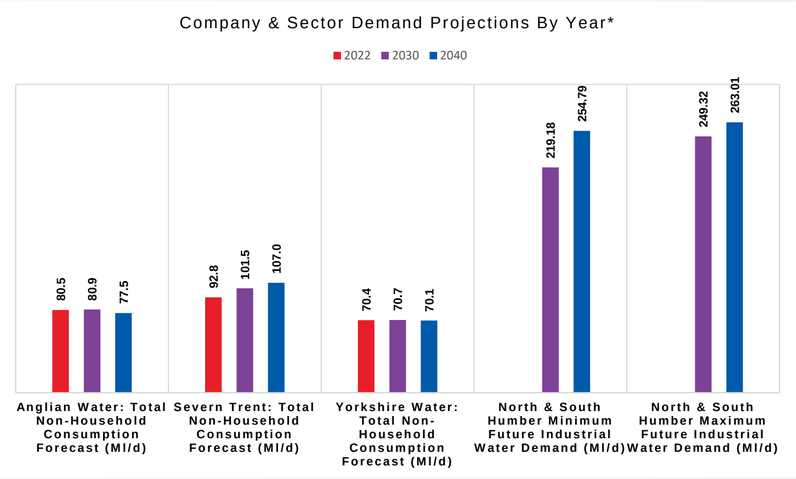
– The projected industrial water demand is not of a similar scale to existing water company non-household demand and projections.

– This highlights that the water sector is not accurately capturing the scale of the non-household (business, industry) demand, and may not have true visibility of the need (see adjacent table and graph).

– In some cases, water companies may be projecting a reduction in non-household demand, or a significantly lower future demand than the industrial sector is forecasting (see graph on next page). This highlights a greater need for collaboration between the sectors.

| Proportions - North & South Humber Projections vs AW + YWS | 2022 | 2030 | 2040 |
|---|---|---|---|
| North & South Humber Water Company ( AW + YWS) non-HH Consumption (Ml/d) | 558.9 | 561.2 | 546.8 |
| North & South Humber Baseline Industrial Water Demand as proportion of Water Company N&S Humber non-HH Consumption (%) | 39% | | |
| North & South Humber Minimum Future Industrial Water Demand (Ml/d) as proportion of Water Company N&S Humber non-HH Consumption (%) | | 39% | 47% |
| North & South Humber Maximum Future Industrial Water Demand (Ml/d) as proportion of Water Company N&S Humber non-HH Consumption (%) | | 44% | 48% |

Source: AW, STW & YWS WRMP24s; HCIP demand study, 2022




Source: AW, STW & YWS WRMP24s; HCIP demand study, 2022

# Contextualising water sector and industrial water demand projections

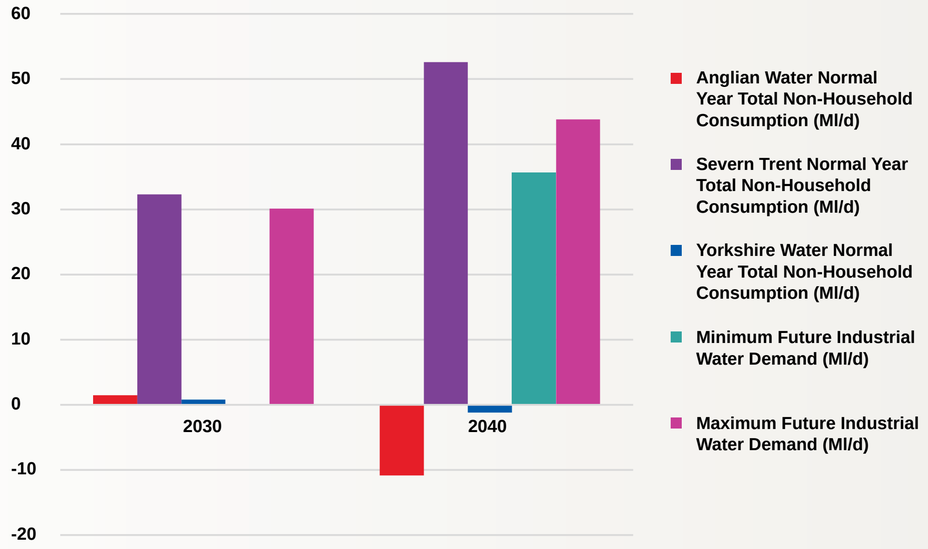
Despite efforts and plans by the water sector, working with the regional groups to identify wider water needs, there is still a gap when it comes to Identifying, funding and delivering schemes that meet the non-household water demand i.e. energy, industrial and business water needs.

There are existing plans and ongoing schemes being developed to address the growth in both domestic and non-domestic demand. However, for the Humber Region, these will not be in place until 2034 at the earliest.

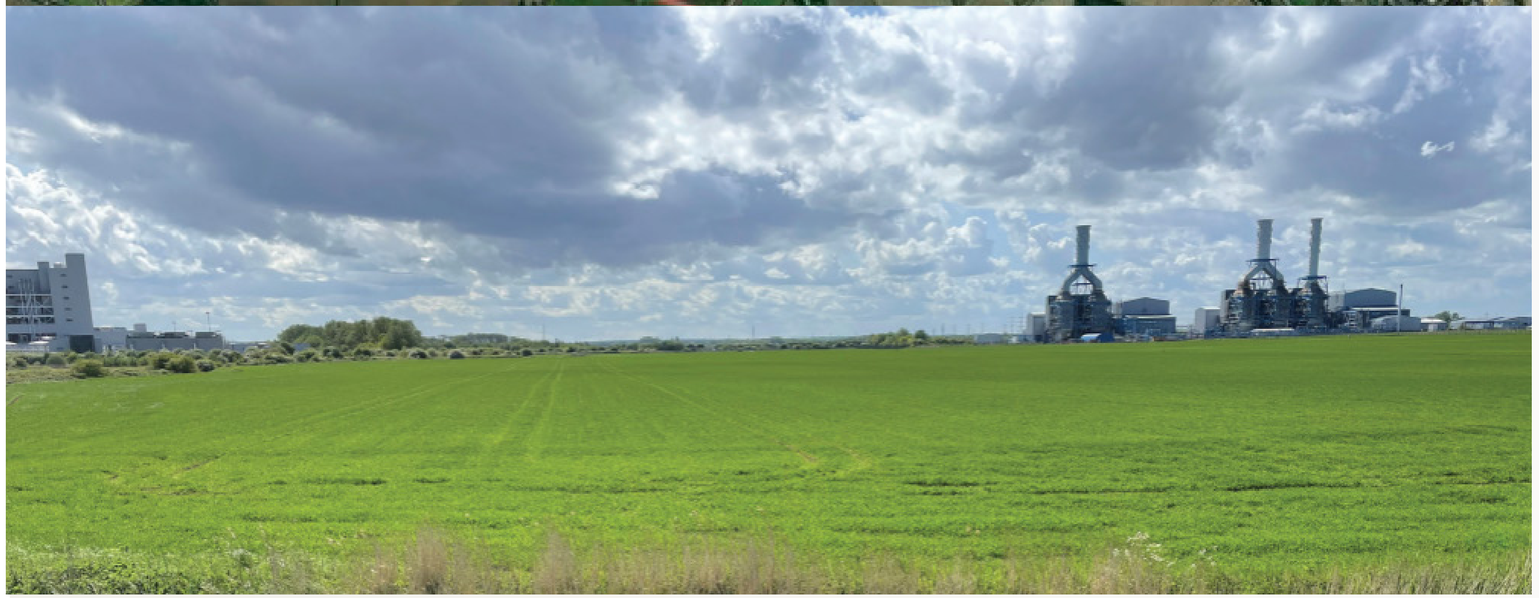
Anglian Water recently (December 2024) received confirmation of funding for the development of Mablethorpe desalination plant. However, this is not expected to be ready before 2034, at the earliest.

Thus, there is still a requirement to explore alternative sources of supply between now and 2034/2035, and possibly until 2040.

It is evident from the table and graphs that existing water company sources are not sufficient, and so alternatives within the energy, industry and business sectors need to be explored. Alternative sources or providers of water supply also must be explored. These are discussed further in Sections 6, 7 and 8 of the report.




**Projected Water Company Non-HH vs Anticipated Industrial Growth, 2030 and 2040**
Source: AW, STW & YWS WRMP24s; HCIP demand study, 2022



## Stallingborough CCGT with Carbon Capture.
**RWE Generation UK Plc.**

RWE Generation UK Plc is developing a new, combined cycle generating plant with carbon capture at a site just off Hobson Way, near Stallingborough.

The project will support the Government's ambitions to deliver net zero energy, whilst maintaining security of supply and will generate up to 900M. We and capture approximately 2 million tonnes of $CO_2$/year.

A water supply is necessary to deliver the potable and raw (process) water required for site operation. The main plant cooling system is expected to utilise water abstracted from the Humber estuary.

However, water from this source is not considered suitable for the potable or process water requirements, meaning an alternative source is required.

– Date security of supply is needed: 2028

– Date water will be needed for facility: 2029

– Quantity needed:

  – Raw (process water): 255 $m^3/h$

  – Potable water: 6 $m^3/h$

Case study provided by:
**RWE Generation UK**


## Humber Zero
### Phillips 66

Phillips 66 Ltd have developed the Front-End Engineering Design for a project to install post-combustion carbon capture of emissions from the Fluid Catalytic Cracker Unit.

The Humber region is water resource constrained, which was a key consideration through the process design. Despite this, some increased water demand will be required to provide the essential cooling needed to ensure the technology works efficiently to capture carbon emissions.

The increased demand amounts to approximately 10% of the existing site water demand. Options for water re-use and treatment at the site have been considered. However solutions that are cost effective have so far not been demonstrated.

– Date security of supply needed: 2026

– Date water will be needed for facility: 2030

– Quantity needed: approximately 1000 $m^3$/day

Case study provided by:
**Phillips 66**

# 5. Key Stakeholders

Stakeholder engagement and consultation is a key component in the management of water resources and development of water resources plans.

ARUP

## Wider Humber stakeholders who have an interest in addressing the water scarcity issues in the region are summarised below:

| Stakeholder | Type | Region Scale | Reason for Engagement | Discussions Ongoing? |
|---|---|---|---|---|
| Anglian Water | Water Utility | Anglian Region<br>Lincolnshire Region | Key regional domestic, non-domestic and wholesale water supplier. Potential non-potable water supplier through wastewater reuse. Member of WRE. | Y |
| Severn Trent Water | Water Utility | Midlands Region | Key regional domestic, non-domestic and wholesale water supplier. Potential non-potable water supplier through wastewater reuse. Member of WRW. | N |
| Yorkshire Water | Water Utility | Yorkshire & Humber | Key regional domestic, non-domestic and wholesale water supplier. Potential non-potable water supplier through wastewater reuse. Member of WReN. | N |
| Wave Utilities | Water Utility | National | Key regional domestic, non-domestic and wholesale water supplier. Potential non-potable water supplier through wastewater reuse. Member of WRE. | Y |
| Water Resources North (WReN) | Multi-Stakeholder Group | North England | Regional group set up to oversee water resources planning for Yorkshire and the North East of England. Includes Yorkshire Water and Northumbrian Water. | N |
| Water Resources East (WRE) | Multi-Stakeholder Group | East England | Regional group set up to oversee water resources planning for the East of England. Includes Anglian Water and over 200 other member organisations. | N |
| Water Resources West (WRW) | Multi-Stakeholder Group | West England | Regional group set up to oversee water resources planning across shared catchments in the west of England, and in Wales. Comprises abstractors, including Severn Trent Water. | N |
| Environment Agency (EA) | Regulator | National | Environmental regulator responsible for abstraction licencing, water availability assessments. Carried out Humber Industrial cluster water study in 2022 and has commissioned similar for other industrial clusters. | Y |
| Ofwat | Regulator | National | Water sector economic regulator responsible for approving water company business plans and setting direction of travel through approval of investment plans | N |
| Defra | Government | UK | Responsible for environmental protection, food production and standards, agriculture, fisheries and rural communities in the UK. On of three government departments involved in the Cambridge Water Scarcity Group which is tasked with, among other things, providing strategic advice to ensure alignment across all key partners, including government, water companies, developers and others across the industry. Secretary of State is responsible for approving statutory water company water resources plans for publication. | N |

| Stakeholder | Type | Region Scale | Reason for Engagement | Discussions Ongoing? |
|---|---|---|---|---|
| Office for Investment (OfI) | Government | UK | The OfI works to promote the UK to investors and businesses around the world, and to attract investment into the UK. Joint unit of HM Treasury, the Department for Business and Trade and Number 10 which works across government to land top-tier investment into the UK. | Y |
| Natural England (NE) | Regulator | National | Government's adviser for the natural environment in England. Helps to protect and restore our natural world, primarily working with the environmental regulator to assess and minimise activities that harm the environment. | N |
| Canal and River Trust (CRT) | Regulator | National | Charity looking after 2,000 miles of historic waterways across England and Wales. Key source of water for navigation, primarily, but also provides abstraction supplies, under licence from the EA. | N |
| Greater Lincolnshire Local Enterprise Partnership (GLLEP) | Charitable Trust | Lincolnshire | Anglian Business-led partnership made up of private and public sector leaders. Works with government and stakeholders to deliver the strategic projects and programmes that will drive local prosperity and economic growth. | N |
| Hull and East Yorkshire Local Enterprise Partnership (HEY LEP) | Statutory | Hull and East Yorkshire | Represents the region's private sector in discussions with government on economic development, and ensures the region's influence is maintained at NP11, Northern Powerhouse and Transport for the North. Also seeks opportunities to collaborate on geographical or sector issues with other parts of the UK and Yorkshire. Covers the two council geographies of Hull and the East Riding of Yorkshire. | N |
| Lincolnshire County Council (LCC) | Statutory | Lincolnshire | Local authority responsible for non-metropolitan area of Lincolnshire county. | N |
| North East Lincolnshire Council (NELC) | Statutory | North East Lincolnshire | Local authority responsible for North East Lincolnshire district. | Y |
| North Lincolnshire Council (NLC) | Statutory | North Lincolnshire | Local authority responsible for North Lincolnshire district. | N |
| Hull City Council (HCC) | Statutory | Hull | Local authority responsible for the city of Kingston upon Hull | N |
| East Riding of Yorkshire Council (ERYC) | Statutory | East Riding of Yorkshire | Local authority responsible for the East Riding of Yorkshire unitary authority area. | N |
| East Lindsey District Council (ELDC) | Statutory | East Lindsey | Local authority responsible for East Lindsey district. | N |
| CATCH | Industry body | Humber Region | CATCH is an industry led partnership supporting the process, energy, engineering and renewable industries in the Humber region. Functions as a national technical skills centre and to be an industry hub for membership and supply chain services. | Y |

| Stakeholder | Type | Region Scale | Reason for Engagement | Discussions Ongoing? |
|---|---|---|---|---|
| Energy UK | Industry body | UK-wide | Trade association for the UK energy industry with over 100 members (suppliers, generators, aggregators, flexibility providers, electric vehicle charging operators and software companies). Works with the sector, government, regulators and wider stakeholders to champion a sustainable UK energy industry. | N |
| Humber Energy Board (HEB) | Board/group | Humber Region | Collaboration of private sector businesses and public sector organisations leading on the energy strategy for the region, and entity behind the Humber 2030 Vision. Comprises the region's leading energy businesses with support from key public sector organisations and academic institutions. | Y |
| Environmental Capacity for Industrial Clusters (ECIC) | Project team | UK | Project team(s) responsible for series of studies assessing the environmental capacity of the UK to support industrial clusters, including assessing water supply and demand. Published Humber study as pathfinder study in 2022. | N |
| Mining Remediation Authority (MRA, formerly Coal Authority) | | UK | Executive, non-departmental public body responsible that manages the effects of past coal mining, including subsidence damage claims which are not the responsibility of licensed coal mine operators. It deals with mine water pollution and other mining legacy issues. Sponsored by the Department for Energy Security and Net Zero. | N |
| Humber Industrial Cluster Plan (HICP) | Project team | Humber Region | Set up in January 2021 following the 2-phase decarbonisation of industrial clusters roadmaps competition in 2019 by UKRI. Project team includes membership organisations CATCH, the HEY LEP plus 8 industry partners. Partners will work together to develop the Humber Industrial Cluster Plan that will set out the strategic roadmap for the Humber Cluster to follow in order to achieve net zero by 2040. | Y |
| Net Zero Hubs | Regional DESNZ group | Humber, Midlands and North regions | Local Net Zero Hubs programme helps local authorities and communities in England to play a leading role in decarbonisation, supporting local authorities to develop net zero projects and attract commercial investment. | Y |
| IDBs<br>– Lindsey Marsh IDB<br>– North East Lindsey IDB<br>– Ancholme IDB<br>– Scunthorpe & Gainsborough WMB<br>– Upper Witham IDB<br>– Isle of Axholme & North Nottinghamshire WLMB<br>– Ouse & Humber Drainage Board<br>– Beverley & North Holderness IDB<br>– Witham First, Third & Fourth District IDBs<br>– Trent Valley IDB | Public bodies | Yorkshire & Humber, Midlands and Lincolnshire Regions | Public bodies that manage water levels in an area, known as an internal drainage district, where there is a special need for drainage. IDBs undertake works to reduce flood risk to people and property and manage water levels for agricultural and environmental needs within their district. Potential to utilise drainage water for supply, on a case-by-case basis. | N |

# 6. Discussion Points

Status of water resource planning and key issues

# Status of water resource planning and key issues

Over the last two to three years, water companies have been developing their latest water resource management plans (WRMP24), covering the period 2025 – 2030. Some companies, including Anglian Water and Yorkshire Water have received direction from the Defra Secretary of State to formally publish their resource plans. The respective accompanying business plans are under review by Ofwat and will be confirmed by the end of 2024. This means that water company investments and plans are largely locked in for the next five years. While the 2025-2030 plans include significant new strategic water resource schemes on a scale not seen before, none of these schemes are expected to be operational before 2030, with the most significant ones not putting water into supply until after 2035.

Schemes such as Lincolnshire Reservoir (Anglian Water) and Fens Reservoir (Anglian Water, Cambridge Water) are intended to be multi-sector water resources. However, this concept is new and has not been tested yet; regulatory and operational thinking continues to evolve. It is also clear from the statutory water resource plans and business plans that public water supply is the core driver for the schemes.

Regional water resources groups are now well-established and are formally leading in the creation of regional water resources plans that, by design, focus on multi-sector water demands. The agriculture, energy and navigation sectors have been reasonably well represented in the first round of plans. Industry, however, is a clear gap in the plans. In addition, local authority development and investment plans which set out industrial investment aspirations need to feed better into the regional water resource planning process. Note that regional water resource plans are not statutory and do not have the same legal weight as the water company plans.

# The foregoing context raises a number of important points for consideration and discussion.

“

How to address the strategic issues of regional water supplies for non-domestic water supply (industry) in the short to medium term (5 - 15 years) to enable and support planned regional investment.

“

How to address the local, tactical issues related to specific sectors, locations, needs and opportunities. For example, growing requirements for water for hydrogen to support decarbonisation, circular water (water reuse) opportunities, engaging the non-traditional water supply entities to provide local solutions.

“

How to better engage the industrial sector with the water resources planning process, specifically ensuring active participation and having a clear, recognised voice within the regional water groups, in line with government and regulatory requirements and expectations.

“

How to work with regulators to unlock water supply through unused licences e. g licence trading, within the context of Sustainability Reductions for environmental needs and wider aspirations for environmental destination.

“

What role water efficiency and water demand management can play in the non-domestic water sector, what opportunities exist and how much can be achieved. This is particularly important given that government has set each water company a target to reduce non-domestic water demand by 9% by 2038 (compared to 2019/20 baseline). There is an opportunity to proactively collaborate on this issue.

“

Understanding and considering the carbon cost of different water sources, particularly when the short to medium term water demand is accounted for, and factoring in the wider context of ultimate decarbonisation through hydrogen.

It would also be beneficial to highlight previous water supply and demand assessments, with a view to determining how the findings of these can be used to support engagement on the water scarcity issue in the Humber and adjacent areas. Two key studies are:

– The EA’s Environmental Capacity for Industrial Clusters Humber Pathfinder Project findings from 2022.

– The HICP Water Study (2022), focusing on water demands for hydrogen.

The studies provide compelling evidence that should be used to inform the regional water resource group work being carried out by WRE, WReN and WRW.

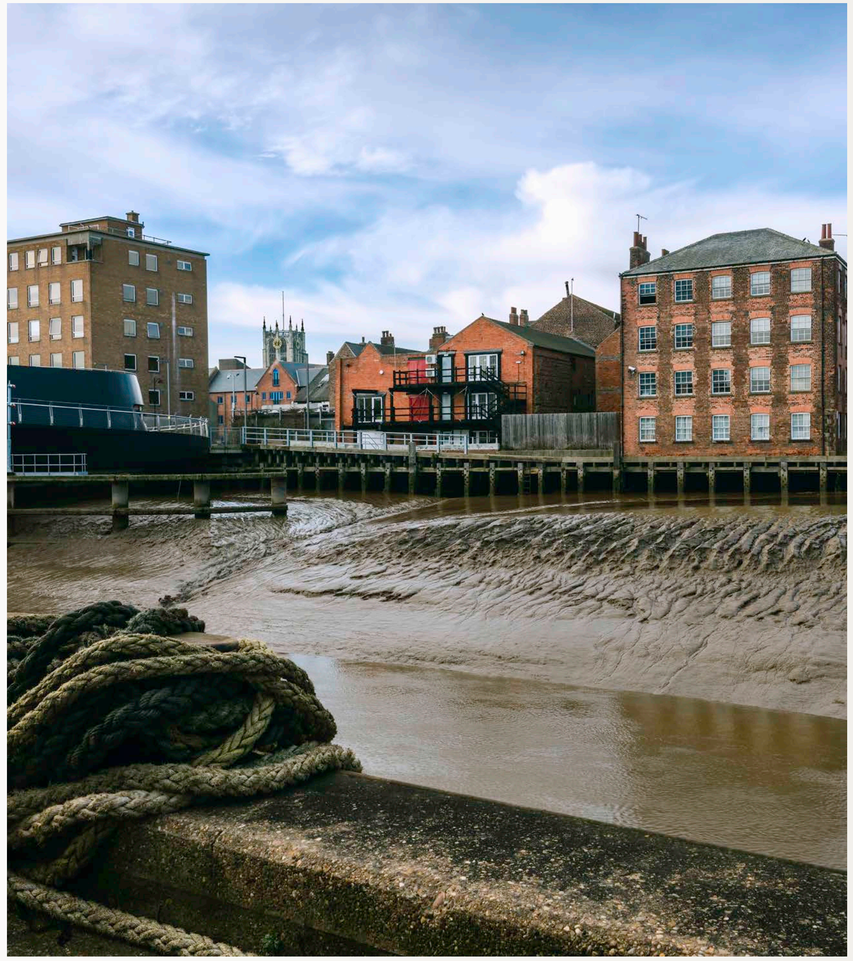
# 7. Opportunities

The following opportunities have been identified for further discussion and potential development of solutions to address the short and medium-term water supply gap that has been identified by stakeholders and this study.

# For discussion

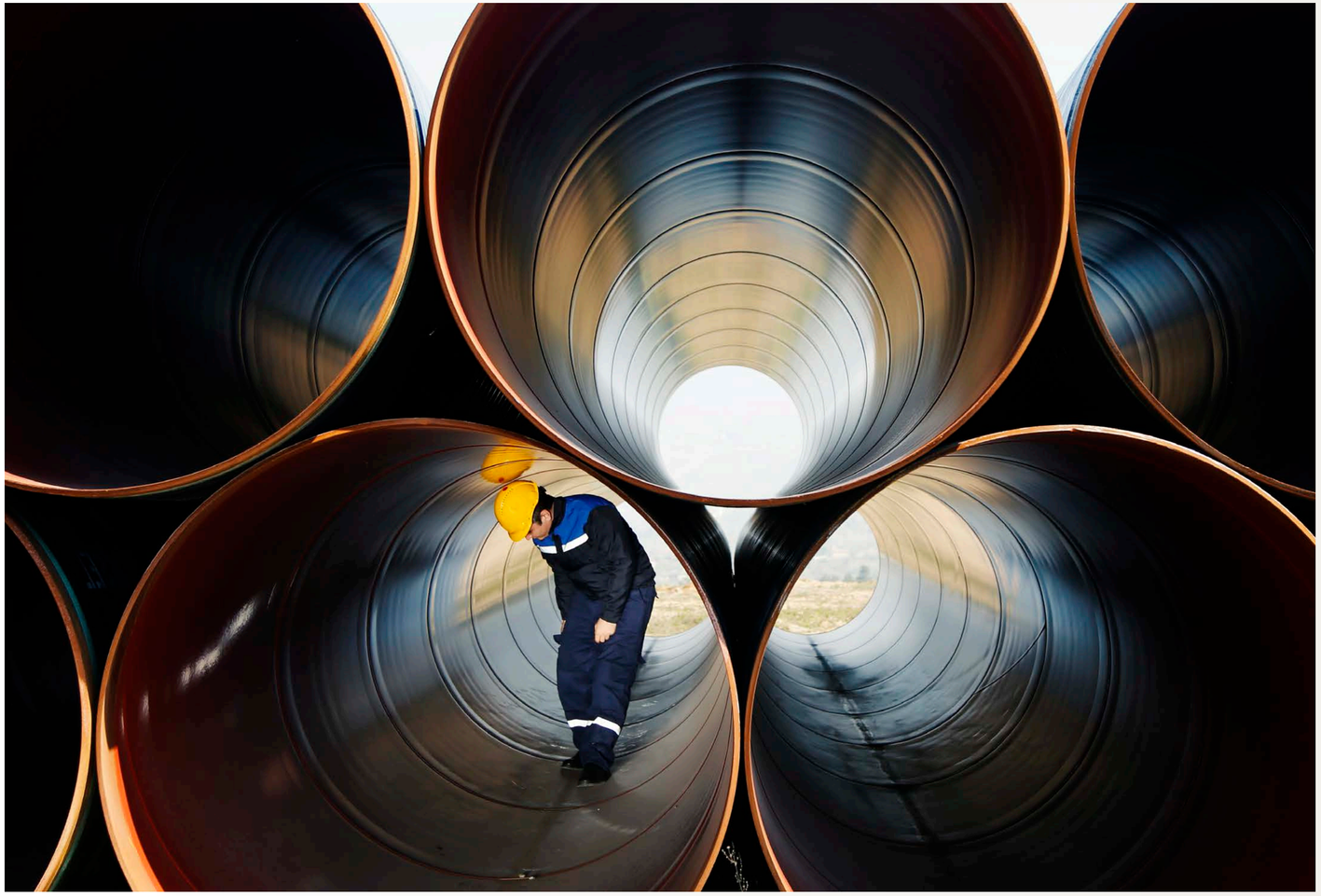
The following opportunities have been identified for further discussion and potential development of solutions to address the short and medium-term water supply gap that has been identified by stakeholders and this study. The opportunities require further stakeholder engagement and are presented for wider discussion to develop a clear way forward.

1. Increase engagement of industry in development of Regional Water Resources Plans
   Energy UK and NFU have consistent representation on regional water resources groups. Engage with them to learn from their experience and use this feedback to identify appropriate representation for the industrial sector on the regional water resources groups. This is an important, immediate need given that the next round of water resources plans (WRMP29, covering 2030 – 2055+) are already in development.
2. Review the abstraction policy
   Engagement with the EA's water resources team (area and national) and the Environmental Capacity for Industrial Clusters (ECIC) project team to understand their research, findings and how these are being used to inform government policy.
3. Develop a Water Scarcity Intervention Strategy
   The EA's Humber Pathfinder Project findings1 can be used to create joint dialogue with Defra, DESNZ and the EA in the first instance, and potentially with Ofwat. The aim would be to collectively address the water gap in the Humber and adjacent region; lessons could be learned from how the government has responded to similar issues around development and water scarcity in the Cambridge area, a key housing and life sciences growth region (see case study in Appendix A). The Ofwat Case for Water Resources Planning Case for Change (January 2024)[1] is also relevant.
4. Identify new water sources
   Engage with and develop relationships with third-party suppliers who have their own water management issues that can provide new sources of water e.g. Coal Authority, CRT and IDBs.



1 https://assets.publishing.service.gov.uk/media/65f6f5d250397e72ccc75592/ea-industrial-clusters-environmental-capacity-phase-1.pdf
2 https://www.ofwat.gov.uk/wp-content/uploads/2024/02/Water-resource-planning-case-for-change-independent-report-Jan-2024.pdf

5. Explore water trading:
   There are potential opportunities for water trading between industries themselves. This may be trading of existing abstraction licences that have spare capacity, or trading of non-potable water through water reuse. Utilisation of private agreements for water supply would mitigate the lack of capacity from the water sector but may require government and Ofwat engagement and intervention to assess how this could be achieved within the current legal and regulatory context, and what changes and enablers may be required.
6. Unlock unused abstraction licences:
   Develop a better understanding of how water supplies can be unlocked from unused, existing abstraction licences, noting the environmental pressures that mean that not all existing licences may be available for use. There is a risk of regulatory pushback as this opportunity develops.
7. Improve holistic understanding of water availability:
   Develop a better understanding of the role of water reuse, water efficiency (including technology to reduce water usage) and circular water must play in decarbonisation and increasing water availability for industry. This will require detailed investigation and understanding of water quality requirements for industrial processes and necessary treatment to achieve the desired.



1 https://assets.publishing.service.gov.uk/media/65f6f5d250397e72ccc75592/ea-industrial-clusters-environmental-capacity-phase-1.pdf
2 https://www.ofwat.gov.uk/wp-content/uploads/2024/02/Water-resource-planning-case-for-change-independent-report-Jan-2024.pdf

# 8. Recommendations

## Next steps

# Next steps

## Strategic Level

Form a unified entities to speak on behalf of all industry stakeholders with government, water companies and regional water resources groups

Fund industry participation and actively engage in regional water resources groups activities.

## Tactical Level

Engage with stakeholders in the region regarding water demand, water efficiency issues, given government target for 9% non-domestic demand reduction

Engage with policy and regulatory sector regarding developing short-term water resources solutions outside of water company business plans (NAV[1] regime or similar).

## Solution Identification

Engage with key stakeholders to confirm the supply-demand balance (regional deficit)

Identify and quantify water availability from non-traditional water suppliers (private third parties), such as Coal Authority and IDBs

Identify and quantify opportunities for private water reuse for non-potable supplies

Identify and quantify resources available from trading of current, unused SW and GW licences.

1 New appointments and variations (NAVs) are limited companies which provide a water and/or sewerage service to customers in an area which was previously provided by the incumbent monopoly provider. For more information, see: https://www.ofwat.gov.uk/regulated-companies/markets/nav-market/

# Appendix A | Case Study

## Cambridge Water Scarcity Group

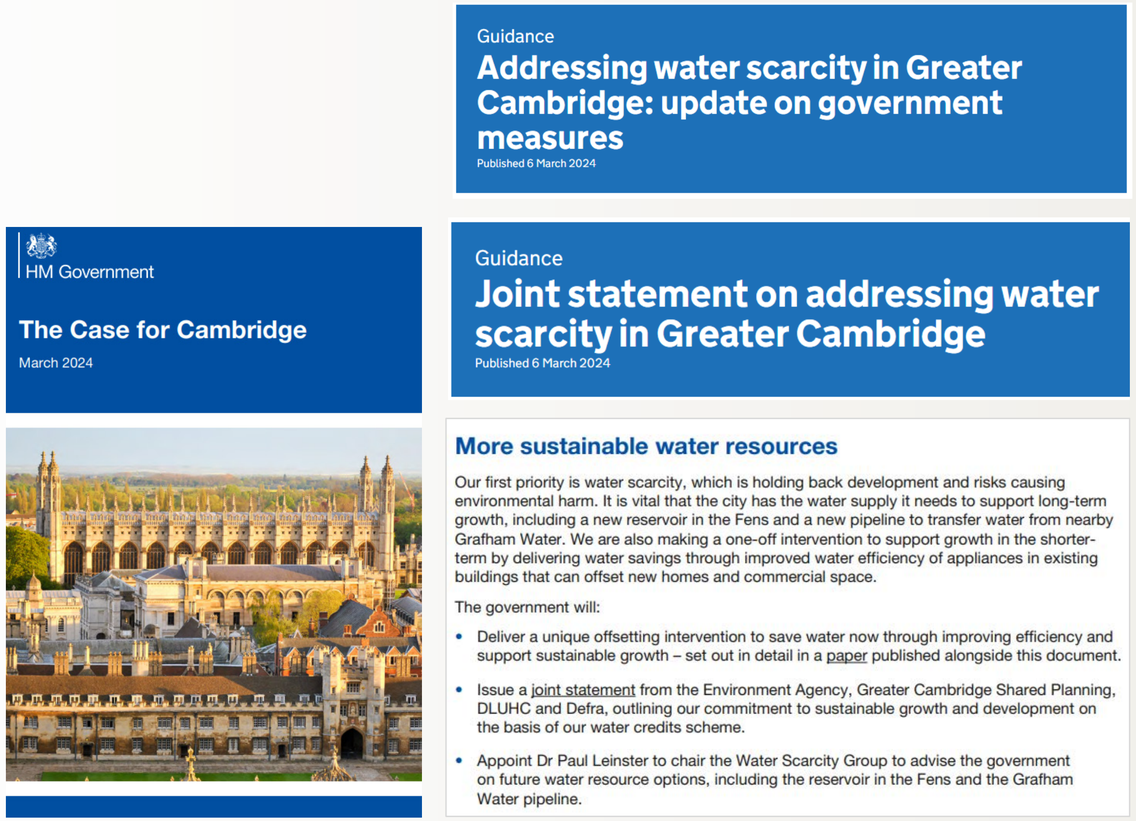
# Ongoing Government response to Cambridge water scarcity: Context

In March 2024, the government published ‘The Case for Cambridge’, a document that sets out ambitions for the city of Cambridge to become a key growth hub due to high prevalence of key technology skills, business clusters and leading global businesses.

The challenges to these aspirations identified include population growth, housing demand and affordability and demand for commercial space.

To address these challenges, government set out aspirations to build between 100,000 – 150,000 homes in Cambridgeshire by 2050, 3 times the numbers in local plans. These plans are threatened by water scarcity, and a number of planning submissions have been rejected or are pending approval due to this issue.

Government recognised this as its ‘first priority’, as it is holding back development and risks causing environmental harm. It responded by deliver a unique offsetting intervention to save water through improving efficiency, outlining its commitment to sustainable growth and development on the basis of its water credits scheme, and setting up the Water Scarcity Group (WSG) to advise the government on future water resource options. Development of solutions is ongoing, coordinated through the WSG.




https://www.gov.uk/government/publications/joint-statement-on-addressing-water-scarcity-in-greater-cambridge/joint-statement-on-addressing-water-scarcity-in-greater-cambridge
https://www.gov.uk/government/publications/addressing-water-scarcity-in-greater-cambridge-update-on-government-measures/addressing-water-scarcity-in-greater-cambridge-update-on-government-measures

# Ongoing Government response to Cambridge water scarcity: Positive outcomes

## The establishment of the Cambridge Water Scarcity Group appears to have had a positive outcome in raising the profile of the water challenges in Cambridge

This has resulted in the prioritisation, in Ofwat's water sector PR24 Final Determination (December 2024), of key supply side measures to address the water issues that have threatened growth and development:

– Fens Reservoir:
  Anglian Water received an increased allowance in 2025-2030 for the Fens Reservoir "to prioritise delivery of the scheme over the Lincolnshire Reservoir in response to external factors" i.e. (£460 m vs £193m).

– Supply Interconnectors:
  Ofwat allowed £617 million for Anglian Water's "substantial programme of interconnectors, moving potable water around its region to service areas with more limited resources like Cambridge and East Suffolk", including an allowance of £266 million for the Grafham pipeline to Cambridge.

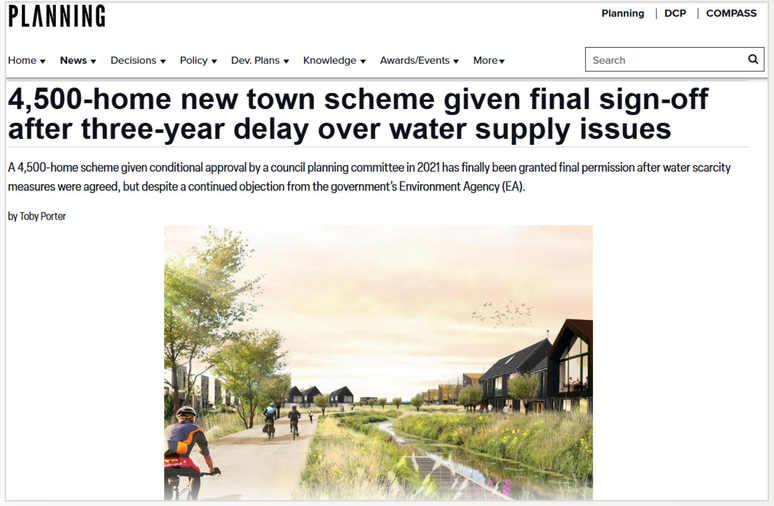
Representations from Cambridge City Council and South Cambridgeshire District Council urging "further consideration of the water supply issues facing the Cambridge area" were acknowledged by Ofwat. It appears planning permission for large schemes is now being unlocked (see example, right).


The planning application was considered by the District Council's Planning Committee in January 2021, where it was agreed that permission should be granted, subject to conditions and completion of a s106 agreement, to secure the necessary infrastructure such as new schools, community spaces and affordable housing.

However, concerns about water supplies and the adequacy of the plans from Cambridge Water to meet future demand, resulted in the Environment Agency objecting to the application.

Through the work of the Water Scarcity Group, established last year, agencies across the area, including the Greater Cambridge Shared Planning Service, have been working to resolve the Environment Agency's concerns.

In November 2024, the Environment Agency replaced their objection to the Waterbeach application, with a recommendation that conditions be imposed.




https://www.gov.uk/government/publications/joint-statement-on-addressing-water-scarcity-in-greater-cambridge/joint-statement-on-addressing-water-scarcity-in-greater-cambridge
https://www.gov.uk/government/publications/addressing-water-scarcity-in-greater-cambridge-update-on-government-measures/addressing-water-scarcity-in-greater-cambridge-update-on-government-measures

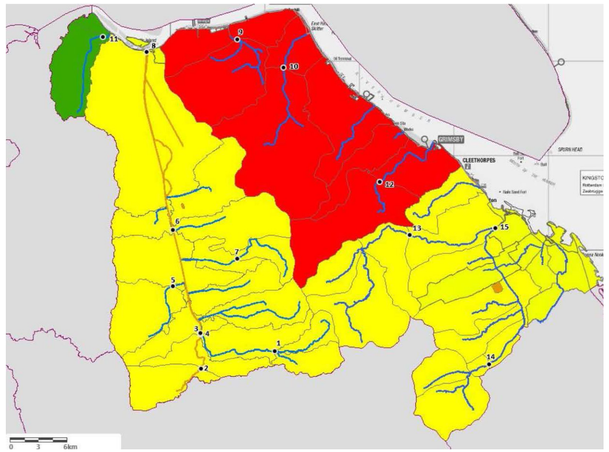
# Appendix B | Summary of Water Availability for Abstraction

South Humber – Grimsby, Ancholme & Louth Abstraction Licencing Strategy (March 2020)

North Humber – Hull & East Riding Abstraction Licencing Strategy (February 2013)

# Grimsby, Ancholme & Louth: Summary of water availability and reliability[1]

**Map 1:**
Water resource availability colours at Q30 for Grimsby, Ancholme & Louth ALS.

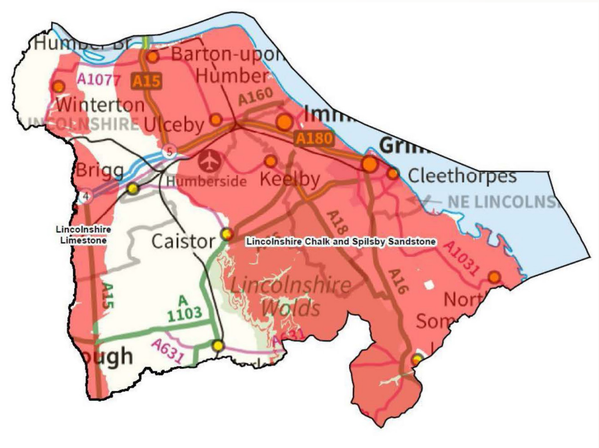




**Water Availability at Q30:**

- Water available
- Restricted water available
- Water not available

**Map 5:**
Groundwater resource availability colours for Grimsby, Ancholme & Louth ALS.

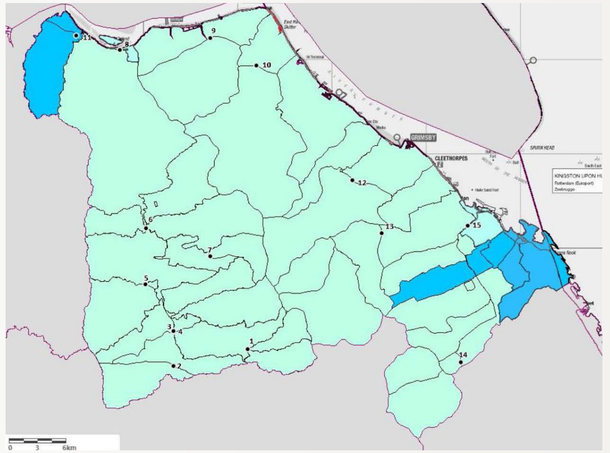





**Water Availability at Q95:**

- Water available
- Restricted water available
- Water not available

**Map 6:**
Water resource reliability of the Grimsby, Ancholme & Louth ALS expressed as percentage of time available.





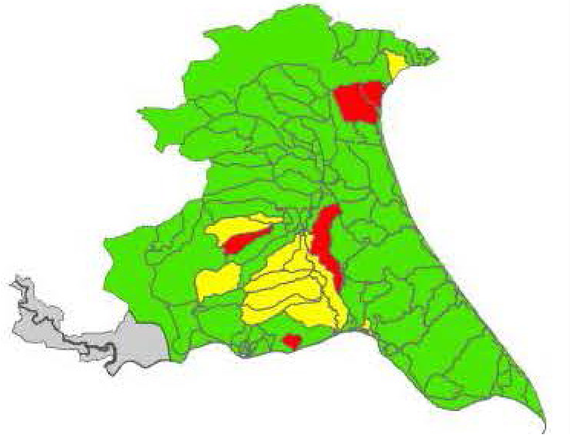
**Percentage of the time additional consumptive resource may be available:**

- 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

1 https://assets.publishing.service.gov.uk/media/5e74df9ed3bf7f46801a3539/The-Grimsby-Ancholme-and-Louth-abstraction-management-strategy.pdf

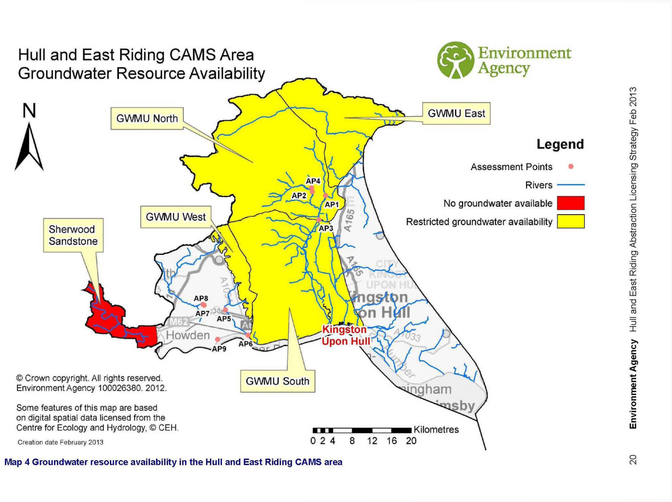
# Hull & East Riding: Summary of water availability and reliability[1]

Water availability at high flows



**Water Availability at Q30:**

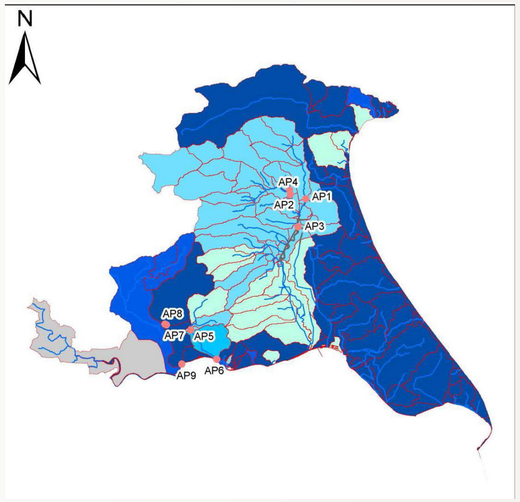
- Water available
- Restricted water available
- Water not available




Map 4 Groundwater resource availability in the Hull and East Riding CAMS area

**Water Availability at Q95:**

- Water available
- Restricted water available
- Water not available

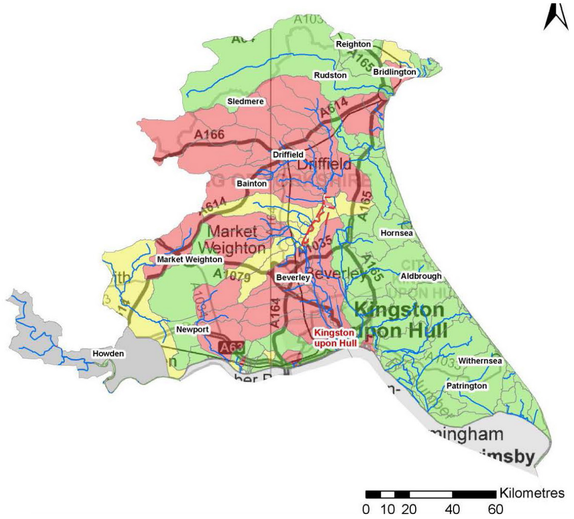



**Percentage of the time additional consumptive resource may be available:**

- 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

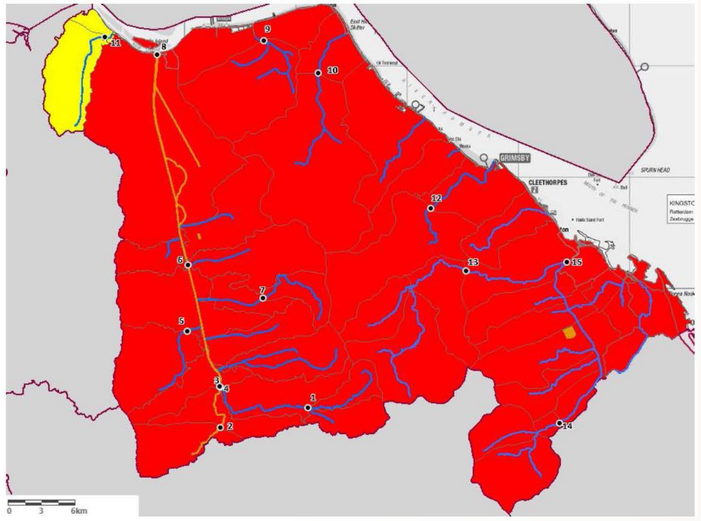
1 https://assets.publishing.service.gov.uk/media/5a7eeec2e5274a2e87db2d00/lit_7867_a7b9fe.pdf

# Water Availability at Low Flows:
# Grimsby, Ancholme & Louth ALS; Hull & East Riding ALS




**Water Availability at Q30:**

- Water available
- Restricted water available
- Water not available




**Water Availability at Q95:**

- Water available
- Restricted water available
- Water not available

**Contact:**
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