

**Albion Water Limited**  
**(draft)Water Resources Management**  
**Plan**

January 2023

Date	January 2023
Prepared	Shaun Jones Head of Regulatory Compliance
Authorised	Ian May Technical Director
Approved on behalf of the Board	Gareth Lindop Acting Managing Director
Secretary of State Permit to Publish	Granted 16 December 2022 on condition of inclusion of the statement below:  <i>Work to create a new bulk supply agreement between Albion Water and Thames Water started on 23<sup>rd</sup> November 2022. This work will update the current outdated agreement and ensure the supply to our customers located in Upper Rissington, Gloucester have a secure supply of drinking water into the future. We will keep our Regulators updated about the progress of this work.</i>
Consultees	Our Customers Regional Development Agencies Local Authorities Natural England Thames Water Essex and Suffolk Water (Northumbrian Water) Consumer Council for Water
Consultation Period Will Close	Any person may make representations to the Secretary of State before 21 March 2023 – the date that the consultation period for our plan will close.  Representations should be sent to: <a href="mailto:water.resources@defra.gov.uk">water.resources@defra.gov.uk</a>  Please include ‘Albion Water dWRMP’ in the subject field and copy to: <a href="mailto:Info@albionwater.co.uk">Info@albionwater.co.uk</a>  If necessary, representations by post should be sent to: Water Resources Management Plan Consultation Defra Water Resources Seacole, 2 Marsham Street, London. SW1P 4DF.

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## 1 Introduction

Our Water Resource Management Plan (WRMP) sets out how we intend to achieve a secure and sustainable supply of wholesome drinking water for our customers, whilst protecting and enhancing our environment at the same time.

Each plan is prepared every five years and forecasts the security of our drinking water supplies over a twenty-five-year period with reviews carried out every year to ensure adaptable changes can be made dynamically.

Plans must comply with all the relevant Statutory requirements and Directions which articulate government policy. They are therefore subject to review and assessment by our Regulators such as the Environment Agency (EA); Office of Water Services (Ofwat); Department for Environment, Food, and Rural Affairs (Defra); and the Drinking Water Inspectorate (DWI).

### 1.1 Albion Water

Licensed by the Office of Water Services (Ofwat) in 1999, through the New Appointment and Variation (NAV) process, Albion Water was the first new water company with the same powers and responsibilities as any other incumbent water company in England and Wales.

We provide drinking water and sewage services to customers located in Gloucester (Upper Rissington), Essex (Oaklands Hamlet), together with Hampshire and Kent where we operate sewage only services.

Since our last WRMP the ownership of Albion Water has changed from Wessex Water to Sustainable Drainage Systems. Whilst this has caused a change in our leadership team and strategic direction, the delivery of drinking water and sewage services to our customers continues unaffected.

## 1.2 Albion Water’s Drought Plan Process

Section 37A of the Water Industry Act (1991) states:

1. It shall be the duty of each water undertaker to prepare and maintain a water resources management plan.
2. A water resources management plan is a plan for how the water undertaker will manage and develop water resources to be able, and continue to be able, to meet its obligations under this Part.

Section 37D of the WIA states:

1. Directions given under section 37A or 37B above may be –
  - a. general directions applying to all water undertakers; or
  - b. Directions applying to one or more water undertakers specified in the directions.

Whilst the WRMP guidelines recognise that they must be applied proportionately to NAV companies Albion Water has previously expressed, and maintains, serious concerns over the impact of the WRMP statutory process on inset competition.

Albion Water has previously submitted that an appropriate route to ensuring reliable supplies to the customers of inset appointees, in the absence of an independent water resource, would be as a statutory consultee to an incumbent’s plan or, consistent with 37D(1)(b) above, under simplified direction. In the absence of these routes, this plan has been completed with the benefit of existing guidance, feedback received and regulatory proportionality

## 1.3 Pre-consultation

Prior to drafting and publication for consultation of our draft WRMP Albion Water consulted Defra, The Environment Agency, Ofwat and incumbent water companies.

Consultee	Response
Defra (Secretary of State)	No formal response received but the EA respond on their behalf.
The Environment Agency and Ofwat	We have been in regular contact with the Environment Agency in producing this plan. We had a pre-consultation meeting with EA and Ofwat on 4 <sup>th</sup> July where we presented our progress with WRMP24 and we received feedback from both regulators which we have incorporated into our draft plan.
Thames Water	Provided information on their WRMP relevant to the SWOX zone in terms of future demand and the resilience and security of our Bulk Supply.
Northumbrian Water	Provided information on their WRMP relevant to the Essex zone in terms of future demand and the resilience and security of our Bulk Supply.

We have also been involved in Regional Water Resource planning groups.

## 2 Water Resources Management Plan (WRMP24)

First submitted in October 2022, this plan covers the statutory minimum period 2025 – 2050 and remains in development until it is finalised and published in August 2023. Publication will follow a public consultation and a response to the feedback we receive.

### 2.1 Levels of Service

Our levels of service will be the same as the relevant incumbent water company for each of our supply areas.

### 2.2 Changes since our last plan

Previous plans were influenced by our green water reuse ambitions for our drinking water and sewage treatment sites located in Gloucester and Essex. However, whilst infrastructure is in place and evidence shows per capita consumption (PCC) can be reduced by approximately 25%, these schemes remain unfunded and subject to engineering and commissioning challenges. As such, our water resource management plan does not account for the benefits of these schemes.

Previous plans contained uncertainties for leakage and consumption figures for our Upper Rissington site in Gloucester. An audit and rationalisation of data together with a thorough review of our billing and metering information has allowed us to make more certain our forecasts compared to previously published water resource management plans. The revised figures are significantly different to those communicated in the past, including within our most recent annual return.

Lastly, we have structured this plan differently to those previously published to allow us to focus on each of our two drinking water sites separately, not least because they are in no way related, geographically or incumbent water company, housing stock, etc.

We have adopted the plan structure suggested within the water resources planning guidance for New Appointments and Variations (NAVs).

### 2.1 Limitations

As new owners we are in the process of reformulating our processes to ensure our information systems are cleansed, enhanced and enriched to be able to provide the best possible service to all our customers, regulators included.

This work will be completed by the start of 2024.



### 3 WRMP – Upper Rissington, Gloucester

Section three focuses on our drinking water supply site located in Gloucester, England and describes how we intend to provide a secure supply to our customers over the next 25 years, whilst protecting the environment.

#### 3.1 Site name and any other historic site names

Upper Rissington, in Gloucester is a former Royal Air Force (RAF) base from the 1930s through World War II and operated as a training base until the 1980s. During the 1980s and early 1990s the base was operated by the United States Air Force (USAF), eventually closing in 1994. In 1996, the housing in the ‘village’, now called Upper Rissington, was sold. The former RAF base was purchased by Linden & Bovis Homes in 2012.

Albion Water was contracted to provide water and waste-water services to the new development area known as Victory Fields and to refurbish and adopt the old private water and waste water infrastructure in the village.

The new development features dual supply infrastructure, where the toilets and outside taps can be supplied from a source of recycled water (treated recycled effluent and/or harvested rainwater) once commissioned.

The successful refurbishment of the water supply network has resulted in a more reliable service and leakage has already been reduced by 1 million litres a day.

A mixture of existing and newly built homes<sup>1</sup> Albion Water provides drinking water and sewage services to the entire site. ‘The Camp’ area contains the older housing stock and supply network where many properties are charged on an assessed (unmeasured) basis. ‘Victory Fields’ area is the location of the new houses with the dual supply infrastructure that is fully metered.

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<sup>1</sup> The site has some existing homes in an area that we call The Camp. Bovis and Linden (now Vistry) have built 368 new build houses in an area called Victory Fields. All 368 homes are metered and have a dual infrastructure for potable and non-potable water supply.

### 3.2 Location map

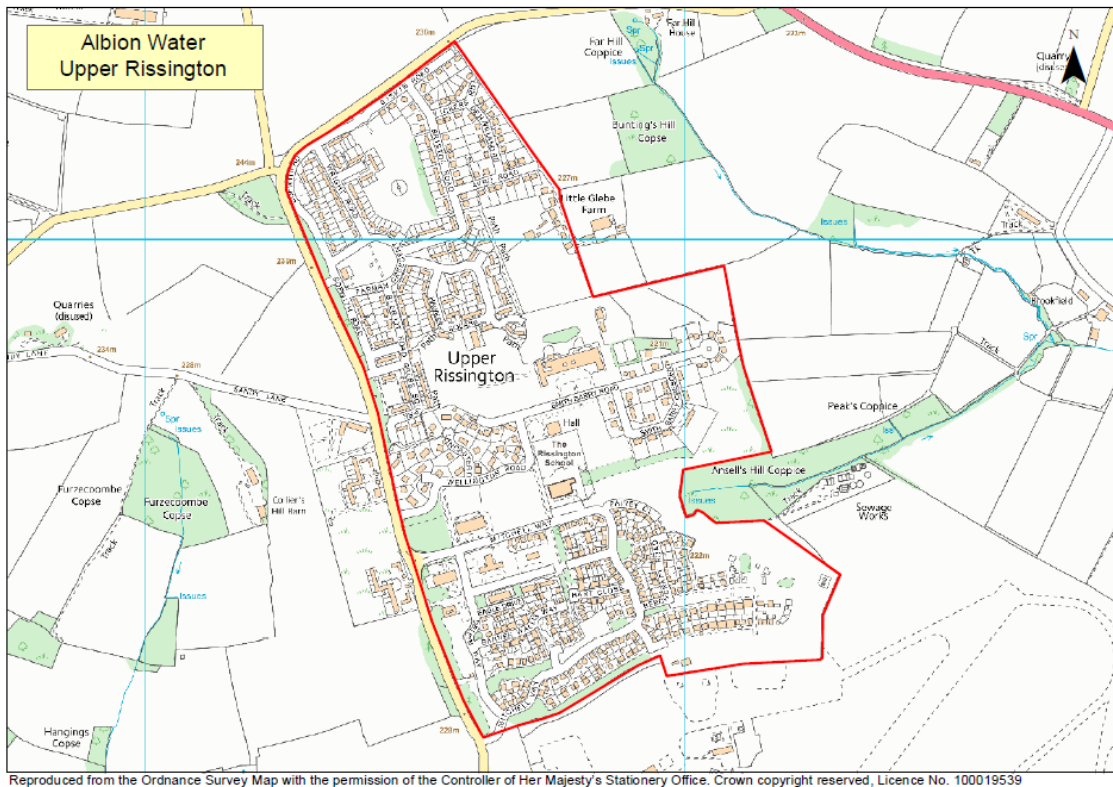


Figure 1 - Upper Rissington, Gloucester

### 3.3 Duration and Details of the Bulk Supply Agreement

Drinking Water supplies to Upper Rissington, is known as a Bulk Supply New Appointments and Variations (Bulk Supply NAV). Drinking Water is supplied under a bulk supply agreement with Thames Water.

Our bulk supply is our water available for use (WAFU).

Maximum Daily Volume	Maximum Annual Volume
307 m <sup>3</sup>	112,055 m <sup>3</sup>

#### 3.3.1 detail the incumbent and relevant water resource zone that your bulk supplies are to be sourced from

Sourced from their Bourton North Cotswold Water Supply Zone, the current bulk supply agreement with Thames Water allows for a maximum daily supply of 307m<sup>3</sup> per day to be taken from the bulk supply point.

The Thames Water infrastructure to our site is capable of supplying us with much more than this as we frequently do use.

Whilst we exceed our maximum daily volume are always well within our maximum annual volume.

3.3.2 detail the duration of the import/bulk supply agreement and whether these can be varied for any reason e.g. drought conditions or pain share agreements. If there are variations, you should describe these restrictions and how you will manage them

Our bulk supply arrangements were last agreed on the 10<sup>th</sup> September 2013 and are negotiated to expire if the NAV is dissolved or if there is a default of terms.

3.3.3 demonstrate that it is secure for the whole planning period. If this is not the case, you should explain the process of renewal and/or change. Your supplies should be secure for at least 10 years

Whilst we are currently running a deficit when compared to the agreed maximum daily and annual volumes, we are assured that the supply from the incumbent is unconstrained and therefore secure for at least the next 10 years.

3.3.4 explain the process for renewing or increasing bulk supplies, where already established.

We meet at least yearly with our incumbent water supplier to discuss our bulk supply agreement and this provides a process for renewing and increasing bulk supplies.

3.3.5 Resilience and security of supply

We regularly exceed our maximum daily bulk supply volume as stated and Thames are able to provide us with this additional water - this source of water is resilient. We consider our daily bulk supply volume to be water is resilient. This has been tested during Covid and this year's drought.

Our deployable output assessment will mirror that of Thames water for the SWOX zone.

3.3.6 Level of Service

Our operating Levels of Service for water supply are the same as our incumbent; Thames Water as detailed in Table 1 below. This table reflects the most recent Level of Service (LoS) as detailed in their current published Drought Plan.

Restriction Level	Frequency of Occurrence	Water Use Restrictions
Level 1	1 year in 5 on average	Intensive media campaign

Restriction Level	Frequency of Occurrence	Water Use Restrictions
Level 2	1 year in 10 on average	Temporary Use Ban and enhanced media campaign
Level 3	1 year in 20 on average	Non Essential Use Ban (NEUB) requiring the granting of a Drought Order and Drought Permits – applied for in a staged manner.
Level 4	Never (in reality this equates to 1 in 100 years on average)	If extreme measures (such as standpipes and rota cuts) were necessary, their implementation would require the granting of an Emergency Drought Order

**Table 1 - Thames Water Levels of Service**

### 3.1 Supply Forecast

Our current supply volume is in excess of the annual supply volume causing a technical deficit. Therefore, by the start of the planning period we will have renegotiated a supply volume of 155,000 m<sup>3</sup> annually. For the moment we believe the supply is unconstrained.

If during any single year of the plan a deficit occurs, or is likely, then we will first bolster our strategy for leakage together with any customer engagement opportunities before then acting to renegotiating the bulk supply agreement.

### 3.2 Any WINEP Investigations

We aren't currently undertaking any investigations through the Water industry national environment programme (WINEP).

### 3.3 Current Population / Property Numbers and Forecast Build Profile

At the time of authoring this plan, Upper Rissington consists of 735 household and 12 non-household properties. Kendrick Homes is currently building 15 household properties that will be available for occupancy in 2023. This takes the number of properties to 750 from the start of the planning period (2025) which we anticipate will remain the same thereafter.

Year	2022	2023	2024	2025
No. HH Properties	735	750	750	750
No. NHH Properties	12	12	12	12

### 3.4 Meter Penetration

75.4 % of household properties are metered and charged on a measured basis. The remaining 181 household properties are charged on an unmeasured basis. However, 41.4 % of these

(75 properties) are metered as part of investments made to better understand consumption, identify and reduce leakage.

Irrespective of billing arrangements, meter penetration for household properties is 85.6 % and across all property types; 85.8 %

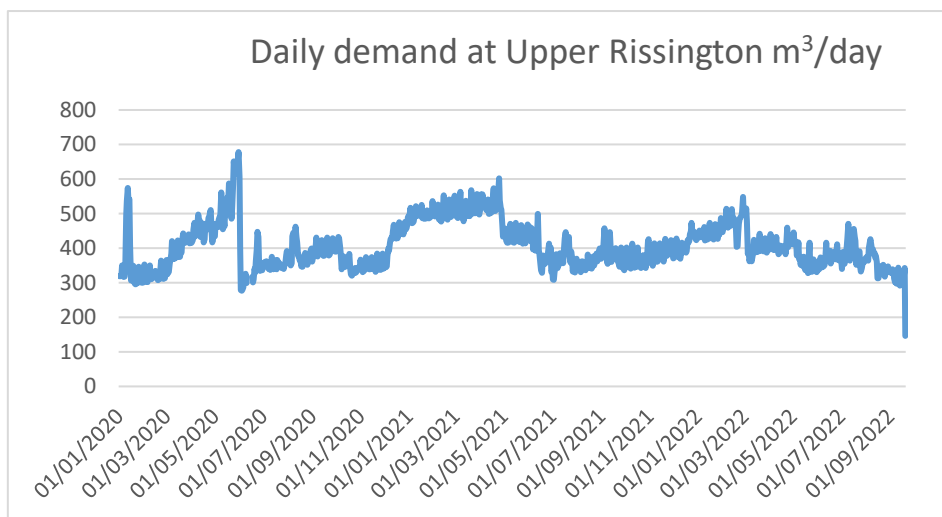
At the start of this planning period, taking in to account the 15 additional properties, meter penetration across all property types will be; 86.0 %

All meters are smart meters.

Upper Rissington	No. Properties	Occupancy <sup>2</sup>	Population
Metered	554	2.36	1,307
Unmeasured	181	2.36	427

### 3.5 Demand Forecast for Drinking Water

Measured using values from our bulk supply meters, the actual annual metered volume of drinking water imported in to Upper Rissington during 2020 was 140,572 m<sup>3</sup> which increased in 2021 to 155,491 m<sup>3</sup> and is likely to achieve 134,772 m<sup>3</sup> for 2022<sup>3</sup>. These are in excess of our Maximum Annual Volume of 112,055 m<sup>3</sup> agreed with the incumbent water company.



**Figure 2 Daily demand at Upper Rissington**

With an additional 15 houses expected to be occupied from 2023, it is likely that demand will increase in the order of 5,133 l/d or approximately 1,874 m<sup>3</sup> per year when applying an

<sup>2</sup> [UK average household size 2021 | Statista](#)

<sup>3</sup> Using 2022 YTD plus Nov and Dec 2019 (The Camp) and Nov 2021, Dec 2018, and average Oct-Dec for Sept 2022 (Rissington).

occupancy value of 2.36<sup>2</sup> and average household consumption of 145 litres per person per day (l/p/d)<sup>8</sup>

We will build in to our plan an increase in demand due to climate change of three percent over the planning period.

### 3.5.1 Per Capita Consumption

Based on meter readings<sup>4</sup> 554 properties (including all the new builds of Victory Fields and some older houses in The Camp) consume 62,944 m<sup>3</sup> annually which translates to a PCC of 131.9 l/p/d (Table 3).

Out of the 181 unmeasured properties we have meters installed at 75. Based on the meter readings (30 March 2021 to 02 March 2022) for 58 properties annual consumption is 9,254 m<sup>3</sup> per year. We can calculate the PCC as 185.2 l/p/d.

Higher than previously determined, this figure is also higher than the PCC values assumed for a new build household property. As a significant sample size, we can extrapolate this rate across all unmeasured households and estimate the daily consumption as 79.1 m<sup>3</sup>/d.

Upper Rissington	No. Properties <sup>5</sup>	Occupancy <sup>2</sup>	Population	Consumption(m <sup>3</sup> /d)	Per Capita Consumption (PCC) l/p/day)
Metered	554	2.36	1307	172.5	131.9
Unmeasured	181	2.36	427	79.1	185.2

**Table 3 – PCC for Upper Rissington**

Average PCC for Upper Rissington is 158.6 l/p/d.

### 3.5.2 Non-Household Consumption

Non household consumption each day is 23.1 m<sup>3</sup> – there is a primary school, one gym, one vet, a small number of shops, including a non-trading cafe and a few offices.

<sup>4</sup> Meter reading data collected April 2021 to March 2022

<sup>5</sup> Albion Water NAV Regulatory Reporting Tables 2021-22

## 3.6 Demand for Drinking Water Management Activities

### 3.6.1 Water efficiency

We will continue to engage with our customers to use drinking water supplies efficiently, and we have several existing channels to achieve this, including our website<sup>6</sup> where there are water saving tips and advice.

In addition to this, alongside our planned smart meter upgrade we will be introducing a smart meter app through which we can engage and advise our customers on wise water use. This work will commence during 2023, and since our existing smart meters are already compatible with the application software<sup>7</sup> we will be able to notify our customers of any internal leaks or increases in consumption over the normal baseline, amongst many other things.

Customers will be able to access the customer engagement portal and see such things as up-to-date hourly usage, and associated charts for daily, monthly, and yearly review of water usage and compare this to similar houses and occupancy.

Furthermore, given that Thames Water is a drought / water stressed area<sup>8</sup> we are able to apply compulsory metering for households that are otherwise billed by assessment.

### 3.6.2 Leakage

In our last Water Resource Management Plan, leakage was estimated at four percent. Similarly, the leakage figure quoted in our annual return was higher than the actual volume determined following our review of data in the manufacture of this plan.

Furthermore, our review identified approximately 20 m<sup>3</sup>/day also previously allocated to leakage that has now been correctly allocated to measured non-household consumption. This water is used in the operation of our sewage treatment works, including for the backwashing of the inlet screens.

Albion Water has an active system of monitoring for leakage within our network at Upper Rissington. When increased volumes indicate a leak we instruct our contractors who investigate and undertake an active find and repair service.

Our daily domestic metered usage is 251.6 m<sup>3</sup> which together with commercial usage 23.1 m<sup>3</sup> accounts for total metered daily usage of 274.7 m<sup>3</sup>, or 100,265.5 m<sup>3</sup> per year.

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<sup>6</sup> [Saving water - Albion Water](#)

<sup>7</sup> [My Water Advisor](#)

<sup>8</sup> Environment Agency email dated 06/07/2022 classifying area as serious water stressed area

With annual bulk imports expected to achieve 134,771.85 m<sup>3</sup> for 2022, the volume of water we can attribute to leakage is 34,506.4 m<sup>3</sup> or 94.5 m<sup>3</sup> per day - or approximately 25 % of our anticipated bulk import volume.

This equates to 54.5 l/p/d (using a population of 1,734)

Our aim to reduce our leakage by 50 % over the planning horizon in line with Thames Water's leakage aspirations, and focus these efforts within 'The Camp' area of Upper Rissington, where due to the age of the infrastructure the drinking water supply network is prone to leakage.

However, as new owners we recognise that this figure is unlikely to be as high as calculated owing to at least the repairs made to the network. Our plan sets out the work to prioritise the information and systems necessary to validate this aspect of our plan.

### 3.6.3 New meter installation / Existing meter replacement

As previously mentioned, we are in the process of moving all of our unmetered customers over onto a meter – we are allowed to do this now as Thames Water is classified as a water stressed area.

This work will mean that customers will pay for what they actually use rather than being on an assessed basis. Our data shows that PCC for assessed properties is approximately 40 % higher than the PCC measured for metered properties (53.3 l/p/d extra). This work will improve our meter penetration and resolve customer household consumption and consequently help refine the volume attributed to leakage.

All the meters in our Oaklands Hamlet are smart meters. However, we are planning to introduce a smart meter app, from the start of this planning period, through which we can engage and advise our customers on wise water use. This work will commence during 2023, and since our existing smart meters are already compatible with the application software<sup>6</sup> we will be able to notify our customers of any internal leaks or increases in consumption over the normal baseline, amongst many other things.

## 3.7 Future drinking water demand forecast

Non household consumption is currently 23.1 m<sup>3</sup> or 8 % of total metered daily usage (274.7 m<sup>3</sup>) and we are not expecting this to increase, not least because the development is practically fully built out.

We forecast a reduction in non-household consumption.

An additional 15 houses are expected to be occupied from 2023, it is likely that demand will increase in the order of 5,133 l/d or approximately 1,874 m<sup>3</sup> per year when applying an



occupancy value of 2.36<sup>2</sup> and average household consumption of 145 litres per person per day (l/p/d)<sup>9</sup>

We forecast that overall total demand (imported volume) will remain stable and broadly within the range 150,000 ± 5,000 m<sup>3</sup> per annum, if not falling to levels reflecting a return to more office based working.

### 3.8 Headroom Assessment

Although the supply is capable of meeting the current demand, we recognise we are running a deficit compared to the maximum daily and yearly volumes agreed in our bulk supply agreement. However, we plan to target a headroom of 10% of the distribution input. This is to accommodate extreme events (7%), such as bursts or societal issues (like those experience during lockdown) but also to account for climate change (3%).

### 3.9 Drinking Water Supply-Demand Balance

Whilst we are technically in deficit when measured against our current bulk supply agreement, we have no reason to believe that the supply is insecure for any period of time over the 25 year planning horizon. This is because we have demonstrated resilience with our bulk supply from Thames Water and have not forecast a deficit in the zone from which our drinking water is supplied from.

No allowance has been made for outage in the supply demand balance. The incumbent water company providing the bulk supplies have made an outage allowance in their supply demand calculations.

### 3.10 Our Plan

We have developed a six point plan for the next planning period which consists of work in the following areas; information systems, bulk agreement, customer, metering, leakage, water efficiency.

#### Information Systems

As new owners we are taking steps to enhance and cleanse our data driven information systems. Our work starts with a wave of internal audits which seek to verify and enrich our records to ultimately improve our company's performance including resolving the uncertainties surrounding leakage. This work will be completed by January 2024.

#### Bulk Agreement

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<sup>9</sup> [DiscoverWater \(en-GB\)](#) (Source: England and Wales: Water UK, three year average Apr 2019 - Mar 2022)

Whilst we are currently running a deficit when compared to our maximum daily and yearly volumes agreed with our incumbent water company through our bulk supply agreement, we will have renegotiated the basis for these by the start of the planning period (2025), if not sooner.

Renegotiated to provide an annual maximum of 155,000 m<sup>3</sup> annually, this should provide ample headroom, when set against a backdrop of compulsory metering, leakage reduction and efficiency drive.

This amount is set conservatively because we might not see the savings / changes in behaviours anticipated amongst our customers to meet the government expectations of 110 l/p/d by 2050. We will, of course, revise the annual maximum contemporaneously.

### Customer Engagement

We will continue to provide our customers with drinking water saving advice and through our smart metering app will be able to enhance engagement about water usage which will apply the learning from our incumbent water company.

Commensurate with our metering programme (highlighted below) there will be a programme of key messaging about usage to help customers reduce consumption towards the 110 l/p/d for 2050.

Customer engagement will be enhanced from 2023 with the roll out of the smart metering app.

### Metering

Evidence<sup>10</sup> of the impact of metering on drinking water demand is that that moving from unmeasured to measured will save approximately 17 % of household consumption. Evidence also suggests that moving from a normal meter to a smart meter will save approximately 5 %. There is no evidence of bounce back (where consumption reverts to pre-smart metering levels) but the industry thinks that this could be averted by engaging the customer.

As previously mentioned, we are in the process of moving all of our unmeasured customers over onto a meter – we are allowed to do this now as Thames Water has been classified as a water stressed area by the Environment Agency. Moving from unmeasured to measured supports a saving of 31.48 l/p/d reducing PCC to at least 153.7 l/p/d for our unmeasured / assessed customers.

In addition, the evidence also supports a saving of 5.6 l/p/d reducing PCC to 125.3 l/p/d for our smart metered customers, once the software<sup>6</sup> has been introduced to customers which allows them to monitor their usage.

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<sup>10</sup> <https://www.frontier-economics.com/media/4946/argiva-cost-benefit-analysis-a4-full-report.pdf>

Whilst we will endeavour to apply metering across all properties as quickly as possible, in the context of our plan we have accounted for these changes in years 2023 - 2025. In 2023-24 and 2024-25 we will have completed the implementation of compulsory metering and rolled out smart metering to customers. By 2025-26, all properties will be metered and therefore we have used the baseline PCC of 125.3 l/p/d thereafter in our plan.

### Tackling Leakage

Our leakage strategy for this planning horizon will be:

1. Reactionary - acting on reported leaks
2. Active leakage control – ongoing maintenance of our network
3. Identifying internal leaks

The Camp is prone to leaks during periods of hot dry weather or cold wet spells. Typically located at the meter box, customers will report these visible leaks which we will then fix on a reactionary basis.

We also use meter data logging tools and will sweep the network if imports of drinking water increases.

The next leaks we are actively identifying are internal leaks. Leaking toilets are a huge problem and if our meter data logging tools suggest a problem then we will notify the customer. If the internal leak is not fixed then as a last resort we will issue a Section 75 Notice for water wastage unduly consumed which the customer must fix within 14 days.

For the Camp area, we will aim to reduce our leakage by 50 % over the planning horizon and this is in line with Thames Water's leakage aspirations. Using the leakage figure expected for 2022 (118.3 m<sup>3</sup> per day) we can determine a saving of 59.15 m<sup>3</sup> per day

### Water Efficiency

The Government's water strategy for England sets an ambition of reduced per capita consumption of water through cost effective measures, to an average of 130 litres per person per day by 2030, or possibly even 120 litres per person per day depending on new technology.

Previously allocated to leakage, approximately 20 m<sup>3</sup> of drinking water is being used each day operationally at our sewage works. We are currently investigating the cost benefit of using an inlet screen which does not require wash water. We are also looking into the possibility of using final effluent for this operational purpose save using any drinking water at all.

Either option would save 7 % of our metered consumption. Our plan is to implement this improvement by 2025, the start of the planning period.

Whilst not integral to our plan for this planning period. We remain buoyant with our ambitious plans to complete work to create the UK's first operational dual supply system. This work will take advantage of the development dual supply infrastructure, where the toilets and outside taps can be supplied from a source of recycled water (treated recycled effluent and/or harvested rainwater) once commissioned.

Toilet flushing and garden watering equates to approximately 25 % of total daily household demand (at peak times) which will have a dramatic benefit for water resources and significantly reduce PCC.

### 3.11 Scenario testing

Any WRMP must be robust, resilient and tested. A WRMP should also be tested for extreme events. In terms of scenario testing our plan, we believe we have tested our baseline twice since our last WRMP.

- Covid
- Drought summer 2022

A global pandemic and lockdown with a significant increase in hand washing and home gardening in 2020 was going to be the ultimate scenario testing. The demand during the first lockdown was a worst case scenario when everyone was at home all day every day, combined with hot dry weather and little rain. An increase in handwashing, increase in general washing and cleaning and a huge increase in gardening and home improvements meant a higher than expected demand. This demand was met during the whole period and with ongoing communication between Albion Water and the incumbent water companies we had a good understanding of their water resource situation. This was regularly reviewed.

#### CASE STUDY: Water supply resilience during Corona virus and Lockdown 2020.

A common question is the resilience of the water supply from the incumbent company during times of peak demand. At both sites we have informal agreements with the incumbent water company that they will be able to meet volumes higher than those stated on the bulk supply agreement. Exactly how much more is not known but will rely on open and ongoing communication between Albion Water and the incumbent water company.

During the Corona virus and associated Lockdown due to Covid 19 and the global pandemic this led to real life scenario testing. We experienced unusually high peak demand at both sites which we comfortably met.

No-one could have foreseen the unusual conditions of Lockdown during the spring of 2020. Lockdown meant that everyone was at home, all day, everyday week after week. This coupled with hot dry warm weather and an increase in handwashing, personal washing, gardening and the purchase of large swimming/paddling pools saw a spike in demand beyond our bulk supply agreements.

The drought of 2022 was also another climate change driven test.

At both of our sites, we have exceeded our bulk supply agreements. We feel confident that presented with unprecedented conditions our bulk supply is resilient and robust.

## 4 WRMP - Oaklands Hamlet

Section four focuses on our drinking water supply site located in Essex, England and describes how we intend to provide a secure supply to our customers over the next 25 years, whilst protecting the environment.

### 4.1 Site name and any other historic site names

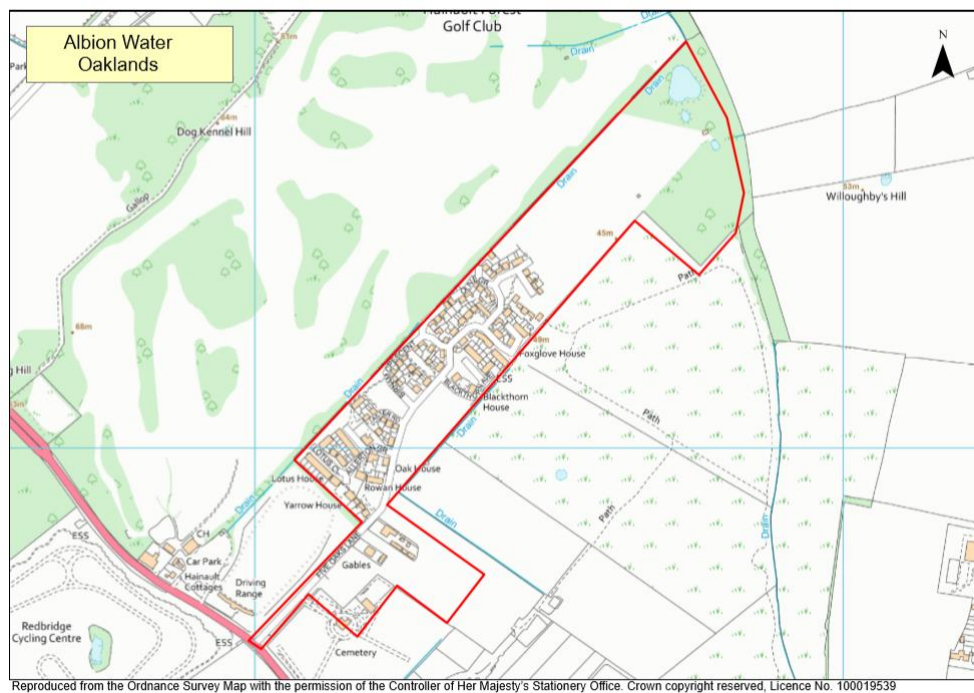
Oaklands Hamlet<sup>11</sup>, Chigwell in Essex was a brownfield site redeveloped by Countryside Homes and consists of 425 new homes and 25 acres of public open space.

The development features dual supply infrastructure, where the toilets and outside taps can be supplied from a source of recycled water (treated recycled effluent and/or harvested rainwater) once commissioned.

Albion Water provides water and sewerage services to the our customers located here.

We have a bulk supply agreement from Northumbrian Water (the parent company of Essex & Suffolk Water) for the drinking water demand and we have built an onsite package sewage works which treats the wastewater.

### 4.2 Location Map



**Figure 3 The area of the Oaklands Hamlet NAV**

<sup>11</sup> Please note: Oaklands Hamlet is now the agreed name for this site in Chigwell, Essex. The previous Albion Water WRMP (published in 2019) calls the site Five Oaks Lane, but the developer and Albion Water now call this site Oaklands Hamlet as also used in our recently published Drought Plan.

### 4.3 Duration and Details of the Bulk Supply Agreement

Drinking water supplies to Oaklands Hamlet, is known as a Bulk Supply New Appointments and Variations (Bulk Supply NAV). Drinking Water is supplied under a bulk supply agreement with Northumbrian Water (the parent company of Essex & Suffolk Water).

Our bulk supply is our water available for use (WAFU).

Maximum Daily Volume	Maximum Annual Volume
143.8 m <sup>3</sup>	52,000 m <sup>3</sup>

#### 4.3.1 detail the incumbent and relevant water resource zone that your bulk supplies are to be sourced from

Sourced from their Romford West Water Supply Zone, the current bulk supply agreement with Northumbrian Water allows for a maximum daily supply of 143.8 m<sup>3</sup> per day to be taken from the bulk supply point.

#### 4.3.2 detail the duration of the import/bulk supply agreement and whether these can be varied for any reason e.g. drought conditions or pain share agreements. If there are variations, you should describe these restrictions and how you will manage them

The original agreement is dated 1<sup>st</sup> April 2016, and the arrangements were last agreed on the 20<sup>th</sup> January 2022 (to increase annual demand to 52,500 m<sup>3</sup>). The agreement was negotiated to expire if the NAV is dissolved or if there is a default of terms.

#### 4.3.3 demonstrate that it is secure for the whole planning period. If this is not the case, you should explain the process of renewal and/or change. Your supplies should be secure for at least 10 years

The previous bulk supply agreement with Essex & Suffolk Water allowed for a maximum daily supply of 85 m<sup>3</sup> per day and a maximum annual volume of 31,000 m<sup>3</sup>. This was insufficient for the demand and so we increased the agreed bulk supply volume to 52,500 m<sup>3</sup> in 2022.

The bulk agreement allows for reasonable variation from the maximum annual limit.

#### 4.3.4 explain the process for renewing or increasing bulk supplies, where already established.

We meet at least yearly with our incumbent water supplier to discuss our bulk supply agreement and this provides a process for renewing and increasing bulk supplies.

#### 4.3.5 Resilience and security of supply

We consider our daily bulk supply volume to be water is resilient. This has been tested during Covid and this year's drought.

Our deployable output assessment will mirror that of Essex & Suffolk Water.

#### 4.3.6 Level of Service

Our operating Levels of Service for water supply are exactly the same as our incumbent Essex & Suffolk Water as detailed in Table 2 below. This table reflects the most recent LoS as detailed in their Final Drought Plan. They have confirmed that these LoS will change.

Restriction Level	Frequency (return period)	Frequency (percentage)
Level 1 - Appeal for restraint	1 in 20 years	0.05 (2%)
Level 2 - Phase 1: Temporary water Use Ban	1 in 150 years	0.0066 (0.66%)
Level 3 - Phase 2: Drought Order Ban	1 in 200 years	0.005 (0.5%)
Level 4 - Pressure Reduction	1 in 250 years	0.004 (0.4%)

**Table 2 Essex & Suffolk Water Levels of Service**

## 4.4 Drinking Water Supply Forecast

Our current supply volume within the annual supply volume. For the moment we believe the supply is unconstrained over the planning period. If during any single year of the plan a deficit occurs, or is likely, then we will first bolster our strategy for leakage together with any customer engagement opportunities before then acting to renegotiating the bulk supply agreement.

## 4.5 Any WINEP Investigations

We aren't currently undertaking any investigations through the Water industry national environment programme (WINEP).

## 4.6 Current Population / Property Numbers and Forecast Build Profile

The Oaklands Hamlet is now fully built out and so there won't be any additional demand arising from further developments, or construction thereof (building purposes and road cleaning).



We therefore anticipate that the demand for drinking water will be stable over the planning period.

#### 4.7 Meter Penetration

All properties in Oaklands Hamlet are smart metered and therefore penetration is 100%.

Oaklands Hamlet	No. Properties	Occupancy <sup>2</sup>	Population
Metered	425	2.36	1003

#### 4.8 Demand Forecast for Drinking Water

Oaklands Hamlet is a fully developed site and therefore anticipate that demand will remain relatively stable across the planning period.

We will build in to our plan an increase in demand due to climate change of three percent over the planning period (this is adsorbed within the headroom target of 10 %, where 3 % is attributed to the impact of climate change and the remaining 7 % a margin for extreme events such as bursts, or societal issues such as those experienced during lockdown).

##### 4.8.1 Per Capita Consumption

Based on meter readings<sup>12</sup> annual consumption is 43,289 m<sup>3</sup> per year. We can calculate the PCC as 118.2 l/p/d.

Oaklands Hamlet	No. Properties	Occupancy <sup>2</sup>	Population	Consumption (m <sup>3</sup> /d)	Consumption (PCC l/p/day)
Metered	425	2.36	1003	118.6	118.2

##### 4.8.2 Non Household Consumption

There is no non-household demand.

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<sup>12</sup> Meter reading data collected October 2020 to October 2021

## 4.9 Demand management activities

### 4.9.1 Water efficiency

We will continue to engage with our customers to use drinking water supplies efficiently, and we have several existing channels to achieve this, including our website<sup>1</sup> where there are water saving tips and advice.

In addition to this, alongside our planned smart meter upgrade we will be introducing a smart meter app through which we can engage and advise our customers on wise water use. This work will commence during 2023, and since our existing smart meters are already compatible with the application software<sup>6</sup> we will be able to notify our customers of any internal leaks or increases in consumption over the normal baseline, amongst many other things.

Customers will be able to access the customer engagement portal and see such things as up-to-date hourly usage, and associated charts for daily, monthly, and yearly review of water usage and compare this to similar houses and occupancy.

Furthermore, Northumbrian Water are happy to work with us and share their learning about delivering successful water efficiency campaigns and achieve a reduction in consumption.

### 4.9.2 Leakage

Leakage at Oakland Hamlet is approximately 6 %. The low levels of leakage is due to the new network of plastic poly pipe which is less prone to leaks than older pipes. In addition, the drinking water source is much less prone to limescale which otherwise contributes to the loss of water through blocking open modern toilet cisterns. Furthermore, we have not identified any internal leaks from our meter reading data.

Albion Water has an active system of monitoring for leakage within our network at Oaklands Hamlet. When increased volumes indicate a leak we instruct our contractors who investigate and undertake an active find and repair service.

Our daily domestic total metered daily usage is 118.6 m<sup>3</sup>, or 43,289 m<sup>3</sup> per year. The average bulk supply volume imported is 126.8 m<sup>3</sup>/d which equates to 46,282 m<sup>3</sup> per year.

Therefore the volume of water we can attribute to leakage is 2,993 m<sup>3</sup> per year or 8.2 m<sup>3</sup> per day or approximately 6.5 % of our anticipated bulk import volume.

This equates to 8.2 l/p/d (using a population of 1003)

We will aim to reduce our leakage by 50 % over the planning horizon

### 4.9.3 New meter installation / Existing meter replacement

All the meters in our Oaklands Hamlet are smart meters. However, we are planning to introduce a smart meter app, from the start of this planning period, through which we can engage and advise our customers on wise water use. This work will commence during 2023, and since our existing smart meters are already compatible with the application software<sup>6</sup> we will be able to notify our customers of any internal leaks or increases in consumption over the normal baseline, amongst many other things.

#### 4.1 Headroom Assessment

Although the supply is capable of meeting the current demand, we recognise we are running a deficit compared to the maximum daily and yearly volumes agreed in our bulk supply agreement. However, we plan to target a headroom of 10% of the distribution input. This is to accommodate extreme events (7%), such as bursts or societal issues (like those experienced during lockdown) but also to account for climate change (3%).

#### 4.2 Drinking Water Supply-Demand Balance

Essex & Suffolk Water are forecasting a headroom deficit from 2025 due to new non-household growth, abstraction sustainability reductions and the impacts of the latest climate change projections on supply. Given the forecast headroom deficit from 2025, their levels of service are likely to change and we will change ours accordingly to be the same.

No allowance has been made for outage in the supply demand balance. The incumbent water company providing the bulk supplies have made an outage allowance in their supply demand calculations.

#### 4.3 Our Plan

We have developed a five point plan for the next planning period which consists of work in the following areas; information systems, customer, metering, leakage, water efficiency

##### Information Systems

As new owners we are taking steps to enhance and cleanse our data driven information systems. Our work starts with a wave of internal audits which seek to verify and enrich our records to ultimately improve our company's performance including resolving the uncertainties surrounding leakage. This work will be completed by January 2024.

##### Customer Engagement

We will continue to provide our customers with drinking water saving advice and through our smart metering app will be able to enhance engagement about water usage which will apply the learning from our incumbent water company.

Commensurate with our metering programme (highlighted below) there will be a programme of key messaging about usage to help customers reduce consumption towards the 110 l/p/d for 2050.

Customer engagement will be enhanced from 2023 with the roll out of the smart metering app.

### Metering

Evidence<sup>9</sup> of the impact of metering on drinking water demand is that moving from unmeasured to measured will save approximately 17% of household consumption.

Evidence also suggests that moving from a normal meter to a smart meter will save approximately 5%. There is no evidence of bounce back (where consumption reverts to pre-smart metering levels) but the industry thinks that this could be averted by engaging the customer.

Whilst already below the Government's target PCC of 130 l/p/d, the evidence supports a saving of 5.9 l/p/d reducing PCC to 112.3 l/p/d for our smart metered customers, once the software<sup>6</sup> has been introduced to customers which allows them to monitor their usage.

The PCC of 112.3 l/p/d is therefore used as our baseline value in our plan from 2025 onwards.

### Tackling Leakage

Our leakage strategy for this planning horizon will be:

1. Reactionary - acting on reported leaks
2. Active leakage control – ongoing maintenance of our network
3. Identifying internal leaks

The Camp is prone to leaks during periods of hot dry weather or cold wet spells. Typically located at the meter box, customers will report these visible leaks which we will then fix on a reactionary basis.

We also use meter data logging tools and will sweep the network if imports of drinking water increases.

The next leaks we are actively identifying are internal leaks. Leaking toilets are a huge problem and if our meter data logging tools suggest a problem then we will notify the customer. If the internal leak is not fixed then as a last resort we will issue a Section 75 Notice for water wastage unduly consumed which the customer must fix within 14 days.

We will aim to reduce our leakage by 50 % over the planning horizon in line leakage aspirations. If achieved, we can determine a saving of 4.1 m3 per day.

## Water Efficiency

The Government's water strategy for England sets an ambition of reduced per capita consumption of water through cost effective measures, to an average of 130 litres per person per day by 2030, or possibly even 120 litres per person per day depending on new technology.

With PCC within our Oaklands Hamlet as low as 118.2 l/p/d, our customers are already using drinking water very efficiently when compared to the national average of 145 l/p/d or the 2030 target of 130 l/p/d set by the Government.

We have targeted PCC of 100 l/p/d by 2050 in our plan.

Whilst not integral to our plan for this planning period. We remain buoyant with our ambitious plans to complete work to create the UK's first operational dual supply system. This work will take advantage of the development dual supply infrastructure, where the toilets and outside taps can be supplied from a source of recycled water (treated recycled effluent and/or harvested rainwater) once commissioned.

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### 4.4 Scenario testing

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- Drought summer 2022

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The drought of 2022 was also another climate change driven test.

At both of our sites, we have exceeded our bulk supply agreements. We feel confident that presented with unprecedented conditions our bulk supply is resilient and robust.

## 5 Drought reliability and drought actions

Albion Water's drought management approach is largely controlled by those of the incumbent water companies whom we have bulk supply agreements with.

The Levels of Service and drought actions published in our Drought Plan are consistent with our WRMP.

The Drought Plan and our resilience in terms our Security of Supply was tested Summer 2022 where an official drought was declared by the Environment Agency.

## 6 Headroom

We plan to target a headroom of 10% of the distribution input. This is to accommodate extreme events (7%), such as bursts or societal issues (like those experience during lockdown) but also to account for climate change (3%).

## 7 Environment Considerations

We have evaluated the guidance we do not feel that a Strategic Environmental Assessment or a Habitat Regulation Assessment is required.

## 8 Commercial in Confidence

There is no commercially confidential material in this document.

## 9 Board Assurance

This Water Resources Management Plan was reviewed by Albion Water's Senior Leadership Team before being recommended to the Board of Albion Water Limited who are assured that the plan would meet our customers demand for drinking water over the next 25 years.