Draft Water Resources Management Plan 2024

ESP Water Limited

December 2022

Contents

Document Control

Version history				
Version	**Date**	**Author**	**Reason for new version**	**Sections affected**
0.01	03/10/22	Catherine Fearon	First draft	N/A
0.02	17/11/22	Catherine Fearon	Second draft following initial review by Defra/EA for public consultation	Included contact details in section 2.4 and addition of Appendix 1.
0.03	30/11/22	Catherine Fearon	Final version for public consultation.	Updated with signatures.

Approval - Signed:

Stephen Morris
Water Managing Director

Date: 01 December 2022

0 Governance

Board Assurance

In conjunction with the requirements of the Water Industry Act 1991, Section 37A to D, our first Water Resource Management Plan (WRMP) has been compiled with ESP Water's Board and following internal presentations on the detail of this plan it has received full approval.

The Board are satisfied that:

- we have met all regulatory obligations in developing our plan.
- our plan reflects relevant regional and incumbent plans.
- our plan is a best value plan for managing water supply and demand relevant to our appointed areas.

Signed:

Kevin O'Connor
Chief Executive, ESP Utilities Group

Security Statement

In publishing our Water Resources Management Plan and in accordance with section 37B (3) of the Water Industry Act 1991, this security statement confirms that no information has been excluded from our plan on the grounds of national security.

Signed:

Simon Lees
ESPUG Operations Director

1 Introduction

1.1 This Water Resources Management Plan

This is a draft of ESP Water's (ESPW) first Water Resources Management Plan (WRMP) since appointment as a water and sewerage undertaker in July 2022. It considers sites for which we have an appointment or variations to that appointment as of 05 September 2022. We expect that variations to our appointments will be granted before their final plan is published and consequently these additional sites will be included when it is submitted in September 2023, following a period of consultation as prescribed by relevant legislation.

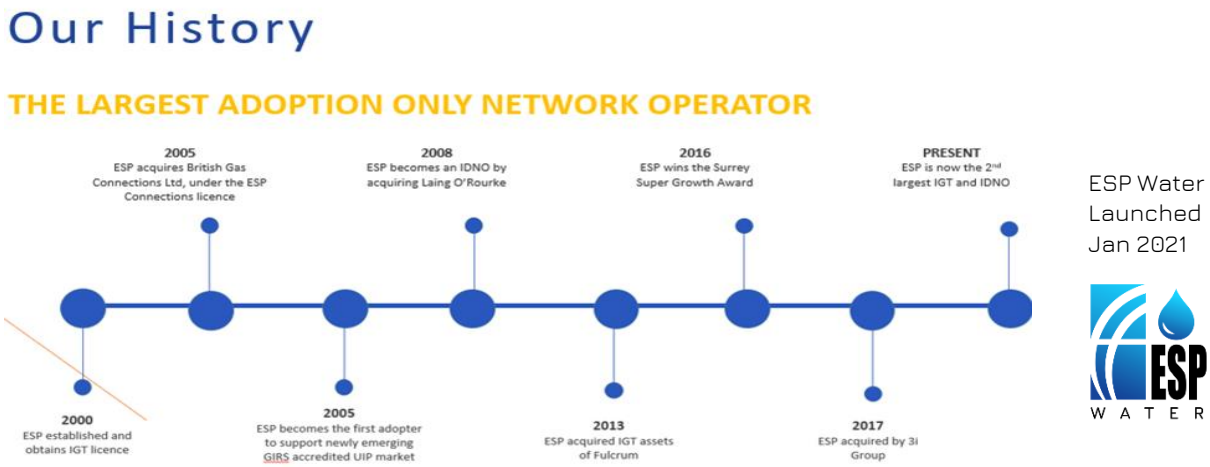
We confirm that we have adequate provision on all development sites to cater for long term planning horizons.

1.2 ESPW

ESP Water (ESPW) is a NAV company (New appointment and Variation) who provides water and wastewater services under an appointment granted by Ofwat, the water industry financial regulator, as set out in the Water Industry Act 1991.

ESPW was founded in 2021 and is part of the ESP Utilities group (ESPUG), which has been providing Gas & Electricity to properties for over 20 years as an asset adoption company. ESPUG have over 650,000 customers connected on a variety of residential, industrial and commercial networks.

ESPUG is partly owned by 3i Investments PLC, and our history is summarised in the diagram below. Further details on the company structure can be found on our website www.espwater.co.uk.



We were granted our first appointment on 24 July 2022 for a site in Salford, Manchester called Merchant's Wharf. Subsequently variations to this appointment have been granted for a further five sites. At the time of the submission of this draft WRMP to Environment Agency (EA) we are not supplying any consumers.

1.3 ESPW sites

With the introduction of competition within the water industry, and following amendments to the Water Act 2003, the opportunity was created for the independent provision of water and sewerage services by new independent licence holders.

New Appointments and Variations (NAVs) allow companies to offer water and/or sewerage services within a specified geographic area instead of the existing appointee. As a result, developers and large non-household customers can choose their supplier for these services and enjoy the benefits of a more competitive market.

NAV licences are granted by OFWAT following a period of consultation and subject to the applicant satisfying certain criteria to ensure the interests of the customers are protected.

We have been granted operating licenses to provide water and wastewater services in place of the existing appointed Water Companies. Since July 2022, operating licences have been granted in areas previously supplied by United Utilities (UU), Northumbrian Water (NWL) and Yorkshire Water (YW). We expect to obtain variations in the Severn Trent Water (STW), South West Water (SWW) and Anglian Water (AW) regions soon. We expect, over time, to have appointments in most of the incumbent areas across England and Wales.

The table below includes the sites to which we are currently appointed. We do not anticipate that there is a risk to the security of supply for customers in these zones since negotiations through the bulk supply agreement (BSA) process with the incumbent water company has already taken place. Tables 1.1 – 1.4 below list the sites by incumbent water company area.

For the purposes of this draft plan, a cut-off date was imposed for inclusion of sites in the planning tables. Those sites currently granted on or before 05 September 2022 are shown in bold. Two further variations were granted between this date and the submission of this draft plan to the EA and are therefore included in the tables below for information. As previously explained any sites granted between the submission of

the draft plan and the final submission of the plan will be included. None of the sites shown here are currently operational.

Table 1.1 – ESPW NAVs within the United Utilities region

Site name	Location	Incumbent WRZ	Service	Date Granted	Date Commenced	Contract Length
Merchant's Wharf	**Salford**	**UU Strategic**	**Dual**	**26/07/22**	**To be advised**	**Indefinite**
Bridgewater Wharf	Salford	UU Strategic	Water only	09/09/22	To be advised	Indefinite

Table 1.2 – ESPW NAVs within the Yorkshire Water Limited region

Site name	Location	Incumbent WRZ	Service	Date Granted	Date Commenced	Contract Length
Sylvester Street	**Sheffield**	**YW Grid**	**Dual**	**05/09/22**	**To be advised**	**Indefinite**
Latitude Purple	Leeds	YW Grid	Dual	22/09/22	To be advised	Indefinite

Table 1.3 - ESPW NAVs within the Northumbrian Water region

Site name	Location	Incumbent WRZ	Service	Date Granted	Date Commenced	Contract Length
Bracks Farm	**Bishops Auckland**	**Kielder**	**Dual**	**05/09/22**	**To be advised**	**Indefinite**

Table 1.4 - ESPW NAVs within the Severn Trent Water Limited region

Site name	Location	Incumbent WRZ	Service	Date Granted	Date Commenced	Contract Length
Wrottesley Park	Perton	STW Shelton	Dual	09/09/22	To be advised	Indefinite

1.4 ESPW's Approach to Water Resources

We do not own or operate water sources. All our supplies are through bulk connections from the local incumbent water company.

We have negotiated Bulk Supply Agreements (BSAs) with the incumbent water companies for each of the sites. These agreements are designed to secure adequate supplies for our customers throughout the 25-year planning period, including sufficient headroom to allow for uncertainties in demand forecasts. Also, the BSA agreed supply volume is an annual average so covers periods of higher and lower demand throughout the year. Both factors ensure that customers will not be placed at any risk greater than if supplied directly by the incumbent. We are confident in the WRMP's of the relevant incumbent companies, with suitable mitigation measures in place where any deficits are forecast.

We are committed to achieving high levels of water-use efficiency. This involves formulating a long-term strategy with developers to reduce water consumption on new domestic and commercial developments.

This strategy will involve innovation and the development of strategic policies by:

a. Promoting efficient water use in domestic properties.
b. Encouraging a reduction in per capita consumption, especially in those areas that have not been constructed to a 110l/p/d standard.
c. Developing customer communication and an awareness of ESPW codes of practice to deliver reliable and sustainable supplies of water and waste water services.
d. Implementing the latest AMR metering technology for all domestic and commercial supplies.
e. Managing leakage to maintain low levels at their sites.
f. Considering environmental solutions and water recycling strategies to meet specific water demand requirements for each NAV appointed development.

1.5 Security Considerations

As a NAV company who is reliant on supplies from incumbent suppliers, we regularly liaise with the incumbents concerning security considerations. Before agreeing to a BSA with us, we model our water requirements and ensure we have robust security arrangements in place for their own infrastructure.

2. The Requirement for and Background to Water Resources Management Plan

2.1 The Role of a WRMP

A water resources management plan sets out how a water company intends to maintain the balance between the supply and demand for water over a 25-year period. It shows how the company expects the demand for water to grow over the planning period and how it plans to meet those forecast demands.

2.2 Legal Requirements

The Water industry Act 1991 (as amended) requires water undertakers to prepare and maintain a WRMP. Defra and the Welsh Assembly Government expect the water companies in England and Wales to follow sections 37A-D of the Water industry Act 1991, the WRMP Regulations 2007 and directions given by government. Compliance to the WRMP (England) Direction 2022, is summarised in Appendix 1.

The statutory process sets out defined stages for consultation. The three principal stages are:

1. Pre-draft consultation with statutory consultees and licensed water suppliers.
2. Consultation with the Environment Agency's regional planners and Ofwat during the preparation of the draft WRMP.
3. Consultation following publication of the draft WRMP with specified organisations, customers, and others likely to be affected by the plan.

The company is required to produce a 'Statement of Response' to stakeholders' comments on the draft WRMP setting out:

1. The consideration we have given to those representations.
2. Any changes that have been made to the draft WRMP because of these considerations.
3. An explanation of where changes have not been made following the consultees comments.

2.3 Timescales

Water companies in England and Wales have a statutory requirement to prepare a WRMP every five years; the final plan will be submitted for approval to the Secretary of State in late 2023 ready for 2024. However, as we are a new NAV company, our initial plan has a relatively small number of sites included. Additional areas are expected to be added regularly including during planning periods, so it is expected that the plan will grow over future iterations.

2.4 Consultation

The statutory process for the preparation of WRMP sets out defined stages for consultation as described above in Section 2.2.

In July and August 2022, We undertook pre-consultations with the EA, Ofwat, Northumbrian Water, Yorkshire Water and United Utilities. Following submission of our

draft plan to the EA and the Secretary of State, we will consult on our plan with the following statutory and non-statutory consultees.

- The Water Services Regulation Authority (OFWAT),
- Natural England,
- Incumbent Water companies we take a supply from including Northumbrian Water, Yorkshire Water, United Utilities and Severn Trent Water
- The Drinking Water Inspectorate (DWI),
- The Consumer Council for Water (CC Water),
- Other interested parties via our website.

In future iterations of our WRMP, our customer base will also be consulted. The full consultation of our draft plan with these stakeholders will last for just over 8 weeks from 01 December 2022 until 01 February 2023 and will be followed by an assessment of any comments and the publication of a Statement of Response as per regulatory requirements, within 26 weeks of publication. Any responses to the consultation should be sent to the following address using ESP Water WRMP as a reference or subject to your email:

Defra,
Water Resources Management Plan Water Services,
Department for Environment, Food and Rural Affairs,
Seacole 3rd Floor,
2 Marsham Street,
London, SW1P 4DF

Email: water.resources@defra.gov.uk. Please copy to Catherine.fearon@espug.com

2.5 ESPW's Strategy

We have negotiated bulk-supply agreements with incumbent water companies at all our appointed sites, with the intention of ensuring that no supply-demand balance is in deficit under baseline demand conditions as well as allowing a reasonable headroom should estimates be too low.

Our Drought Plan will set out the short-term operational steps we will take to maintain supplies in the event of a severe drought. This is required six months after the first appointment and a draft will be completed by 27 January 2022. This will then be subsequently consulted on, and any learning will also be included in our final WRMP if appropriate.

Our Strategy for maintaining a positive supply-demand balance can be summarised as follows:

1. Monitor actual demand as sites are developed to their full potential and develop a database of historic demand data to aid future demand planning.
2. Implement a targeted programme of leakage monitoring and control (based on metering data) to maintain levels of leakage at or below the sustainable economic level.

3. Implement efficiency measures to reduce per capita consumption to target levels consistent with the aims and objectives set out in the CFSH (Code for Sustainable Homes)
4. If available headroom is below target headroom, then options will be considered to reduce the supply/demand deficit. This will entail one or both of the following:
    a. increase the quantities specified in bulk supply agreements or
    b. implement demand management measures if these have not yet reached their optimum level of performance.

Demand management measures could include:

- Increasing levels of education, marketing and communications to encourage a reduction in demand.
- Provision of water saving devices to customers.
- Assistance for customers to fix issues with supply pipe and plumbing losses, however customer side leakage is unlikely to be identified until the end of the planning period.

2.6 Levels of Service

A water company's target level of service is the standard of service (effectively the reliability of supply) that a customer can expect to receive. It is a form of contract between a water company and its customers. Due to the nature of our sites, our levels of service are aligned to those of the incumbent water companies.

A water company's success in delivering its stated levels of service long term depends on the combined effectiveness of its WRMP and Drought Plan. It is accepted within the water industry that it would not be economically justified, or environmentally sustainable, to develop long-term plans that removed completely the need to periodically introduce restrictions on customer's non-essential use during more extreme drought events. The target level of service is therefore the average frequency with which restrictions on water use is expected to be applied to customers. This frequency should be considered appropriate both in terms of customer expectation, impact on the environment and cost implications. The quantity of water to be supplied under the bulk supply agreements allow for unconstrained demand in each site to be supplied both now and in the future. However, the agreements also allow for reductions in bulk supply to be applied during times of drought. Our levels of service are therefore effectively aligned to those of the incumbent water companies and the annual risk will be regularly reviewed throughout the planning period. These are the restrictions on water use that we will apply as drought severity increases (categorised according to incumbent supplier) (Tables 2.1 – 2.4):

Table 2.1 – ESPW's levels of services for United Utilities Limited region

Level	Action	Frequency of implementation (drought severity)	Annual risk of Restriction
1	Temporary use bans	1 in 20 years	5%
2	Drought order	1 in 40 years	2.5%

Table 2.2 – ESPW's levels of services for Yorkshire Water Limited region

Level	Action	Frequency of implementation (drought severity)	Annual risk of Restriction
1	Temporary use bans	1 in 25 years	4%
2	Drought orders	1 in 80 years	1.3%
3	Emergency Restrictions	1 in 500 years	0.2%

Table 2.3 – ESPW's levels of services for Northumbrian Water Limited region

Level	Action	Frequency of implementation (drought severity)	Annual risk of Restriction
1	Appeal for restraint	1 in 20 years	5%
2	Temporary use bans	1 in 150 years	0.66%
3	Drought orders	1 in 200 years	0.5%
4	Rota cuts	1 in 250 years	0.4%

Table 2.4 – ESPW's levels of services for Severn Trent Water Limited region

Level	Action	Frequency of implementation (drought severity)	Annual risk of Restriction
1	Appeal for restraint	N/A	N/A
2	Temporary use bans	3 in 100 years	3%
3	Drought orders	3 in 100 years*	3%*
4	Emergency Restrictions	< 1 in 500 years	< 0.2%

*While listed as the same frequency as Temporary Use Bans, would only be used following an existing Temporary Use Ban.

2.7 Non-Drought Hazards

Considering our supplies are derived from bulk supply contracts and we do not own any above ground infrastructure on its clean water network the non-drought hazards are minimal. However, we reviewed the potential hazards as detailed in the UKWIR guidance 2013a on our network and the following were identified as presenting a very low risk to our supply resilience and have been factored into their calculations. These are:

- Freeze-Thaw.
- Landslip / subsidence.
- Third Party - emptying inappropriate material into manholes.
- Geological processes
- SEMD Hazards

Note SEMD hazards in this context are risks to our assets and infrastructure, not to the supply from the incumbent as these risks will be included in their WRMPs.

2.8 Greenhouse Gas Emissions

We obtain water from bulk supplies and does not abstract, treat or store water. Neither do we have any pumping stations on our clean water networks. Although we install polyethylene pipes, the production of greenhouse gases resulting from the manufacture and transport of these products is assessed by the manufacturer rather than the end-use to prevent double counting. we have a small fleet of company vehicles and consider our vehicle emissions to be negligible; this will be evaluated on an ongoing basis as the business grows. Consequently, we assess our contribution to Carbon Dioxide equivalent emissions to be negligeable.

2.9 Current Situation Regarding Development of Supply Areas

Table 2.5 below shows the expected number of connected customers at full development together with the actual numbers of connected customers on submission of this draft WRMP for all our sites.

Table 2.5 Current and final levels of development at ESPW sites*

Site	No. of connections - Domestic		No. of connections – NHH	
	Current	Final	Current	Final
Merchant's Wharf	0	196	0	1
Bracks Farm	0	201	0	0
Sylvester Street	0	335	0	1
Bridgewater Wharf	0	376	0	10
Wrottesley Park	0	220	0	0
Latitude Purple	0	463	0	2

* Bridgewater Wharf, Wrottesley Park and Latitude Purple are not included in the planning tables for draft submission.

2.10 The Scope of the Plan

We have followed the relevant guidance when creating our WRMP and the main components of a WRMP are summarised below:

- A baseline forecast of demand for the 25-year planning period, assuming current demand policies.
- A baseline forecast of the available water supplies over the same period making assumptions about current resources and future known changes.
- From these forecasts, prepare a baseline supply-demand balance by computing whether there is a water surplus or deficit in each year of the planning period.
- If there is a deficit, devise and select water management solutions to make up the deficit.
- Assess the cost and benefits of a range of supply and demand options and provide justification for the proposed preferred solutions.

- Prepare a final-supply demand balance, taking the preferred water management solutions into account.

As mentioned in section 1.4, all the company supplies are bulk transfers therefore there is no requirement to carry out a deployable output assessment, nor the associated assessment of how sustainability reductions or the impact of climate change might affect supplies. These risks are born by the donor company, although in times of drought our customers will have to share the impact of any supply restrictions on an equitable basis.

3. The Supply-Demand Balance

3.1 Introduction

This section describes the general methodology used to compute the supply-demand balance, the data available and the assumptions made. Detailed balances for each of the WRZs covered by this plan are presented and discussed in section 4. These will need to be revisited as data on actual consumption and water delivery become available. Assumed or estimated values can then be substituted with actual data. The opportunity to do this arises with each annual review of the plan with a new and revised plan due after five years.

It should be noted that none of the areas fully included in this plan are currently in water stressed areas, however some sites due to be included in the final version of this plan maybe in such areas.

3.1.1 Deployable Output

We do not own or operate water supply sources of its own. All supplies are bulk transfers from the incumbent water companies. There are no exports out of our supply areas. In general, the quantity of water to be made available in each site has been negotiated with the incumbent water company such that no supply-demand deficit is envisaged within the 25-year planning horizon. Quantities are based on estimates of the total water requirement (baseline demand and operating losses) in each inset area at projected final build out, i.e., after all the currently proposed development is complete.

Quantities are defined in terms of an annual maximum volume in m3 /year, a maximum daily volume in m3 /day and a maximum instantaneous flow in l/s. The maximum instantaneous flow calculation methodology varies between incumbent companies whilst keeping in line with UKWIR guidance; it generally uses a peaking factor provided by the incumbent that is multiplied by the average volume.

Values are set out in separate bulk supply agreements between ESPW and incumbent water companies. (Tables 3.1.1 – 3.1.4). Sites in bold are included in the planning tables.

Table 3.1.1 Agreed limits to the bulk supply within the United Utilities Limited region

Site	Maximum Instantaneous flow l/s	Maximum daily volume m3/d	Maximum annual volume m3/yr
Merchant's Wharf	**10**	**77**	**28105**
Bridgewater Wharf	21	143	52493

Table 3.1.2 Agreed limits to the bulk supply within the Yorkshire Water Limited region

Site	Maximum Instantaneous flow l/s	Maximum daily volume m3/d	Maximum annual volume m3/yr
Sylvester Street	**4**	**94.1**	**34352**
Latitude Purple	18.7	120	43827

Table 3.1.3 Agreed limits to the bulk supply within the Northumbrian Water Limited region

Site	Maximum Instantaneous flow l/s	Maximum daily volume m3/d	Maximum annual volume m3/yr
Bracks Farm	**3.1**	**100.16**	**36559**

Table 3.1.4 Agreed limits to the bulk supply within the Severn Trent Limited region

Site	Maximum Instantaneous flow l/s	Maximum daily volume m3/d	Maximum annual volume m3/yr
Wrottesley Park	2.6	92.8	33884

When expressed as a daily rate, the maximum annual volume represents the average rate of transfer that can be maintained over the year. There are peaks of demand within this, normally in summer months and/or dry years when high temperatures lead to temporary highs in consumption. The maximum allowable daily transfer is at a higher rate than the annual volume to take these peaks into account. The maximum daily and annual volumes will be supplied by incumbent water companies save in exceptional circumstances when supplies could be reduced. The incumbent water

companies are entitled to reduce bulk supplies in cases of Emergency or 'Force Majeure'. Droughts are considered an emergency.

3.1.2 Outage

Outage is a temporary, short-term loss in deployable output caused by unforeseen or unavoidable events affecting any part of the water supply system. The supply failure would normally last at least 24 hours before being considered a legitimate outage event. However, interruptions longer than 3 months would be considered reductions in deployable output rather than outage. As we do not operate any sources or treatment works, any outage events upstream of the point of connection for the bulk supply will therefore be considered in incumbent company's assessment of Water Available for Use (WAFU), but not ESPW's. Any issues relating to the reliability of the bulk transfer are allowed for under Headroom.

3.2 Demand

In line with Government policy, all new properties will be metered using the latest AMR metering technology for domestic and commercial supplies. These meters are 'SMART ready' and could in the future be connected to displays. Table 2.5 shows the number of properties that have been built to date, which for the purposes of this draft WRMP is 0.

Existing data on water consumption is heavily influenced by the volume of water used during construction at each site for building supplies, batching plants, water mains testing, commissioning of waste water networks, road sweeping, and gully cleaning.

A reasonable period of 'normal' consumption is needed, free from construction activities, before usable data on actual consumption can be obtained. In the meantime, demand must be estimated using industry-standard or average rates for the water industry, or typical values recorded elsewhere in the region, particularly in neighbouring areas.

Nevertheless, it is important to take account of key differences between inset areas and the surrounding region. For example, all properties in the inset areas are new and built to modern standards of water efficiency. All will be built after the latest amendments to Building Regulations which came into force in October 2009. Metering is generally believed to lower per capita consumption and so the fact that all properties in the insets will be metered is an important consideration.

3.2.1 Domestic Demand

Domestic demand is estimated as the product of the number of properties times their occupancy (number of people per property) times the rate of per capita consumption (PCC – expressed in litres/person/day or l/p/d). The Government's water strategy for England sets out a vision for the year 2030 which includes, "Reduced per capita consumption of water through cost effective measures, to an average of 130 l/p/d by 2030, or possibly even 120 l/p/d depending on new technological developments and innovation." (Defra 2008) New housing (which forms the whole of our asset base) should be built to the 125 l/p/d/standard. It might be expected that over time, and with

our commitment to aim for the highest levels of water efficiency, it will be possible to achieve lower PCC rates.

However, for initial planning purposes we have assumed a constant site calculated PCC for domestic demand throughout the planning period. This has been calculated based on the types of properties in these resource zones and the anticipated occupancy and subsequent PCC of these properties. Going forward estimates will be based on actual measured metered consumption. The number of domestic connections at full development in each inset area has been defined by the developers (Table 2.5) although there is uncertainty about the rate of development and when full build-out will be achieved. This will depend on the rate of house sales which in turn will depend to a large extent on the 'economic recovery' and the state of the national and local economy.

For demand forecasts, it has been assumed that domestic properties will be built at a rate not exceeding 200 properties per year depending on the size of the overall development. This rate will undoubtedly vary from year to year but as it is thought that the development of new sources of supply within the planning period will not be necessary, the rate of house building is not critical unless more than one bulk supply connection needs to be made. With the number of domestic and commercial properties at full development already known, the only uncertainty in numbers of population served is in the occupancy levels. With smaller families and a tendency for more people to live alone, occupancy levels across the country are falling. Occupancy levels within the inset areas will not be known until customers begin to move into the new homes, so are estimated in our calculations.

3.2.2 Non-Domestic Demand

The number of non-domestic connections at full development in each inset area has been defined by the developers (Table 2.5) the developments include a small number of non-household (commercial) properties. The initial areas supplied contain a small number of commercial properties. Water demand in commercial developments is related to internal floor area and the number of people working or living there. The property mix can vary enormously, as can water consumption expressed per person or per square metre. Commercial demand therefore has been calculated separately for each WRZ and going forward will use metered consumption.

3.2.3 Water efficiency

Water efficiency is an integral part of resource planning and we have a statutory duty to promote the efficient use of water. Key to this is support for customer behavioural change. We believe that it is important to support and assist customers with these changes and this will be the key strand of our work during the period along with promoting our service level targets.

All new buildings will be designed with water efficiency in mind and all our properties are metered. Customer consumption from meter reads is monitored to either investigate for leakage or to issue letters to customers advising that we are high users along with tips on being water wise. Our company publication entitled "Using water wisely at home" sets out a programme of water efficiency initiatives that focus on education, advice and raising awareness. This publication is provided free to every

new customer and is available to view on our web site. We are considering publishing Summer and Winter newsletters to all their domestic customers which include details on detecting leaks and water wise tips. Call centre agents are trained on how to discuss / direct customers to their water wise sections of the website and how to talk customers through leak detection techniques.

During the next 5 years, we will monitor and utilise site-specific consumption data to target the delivery of water-efficiency messages to their customers in specific zones and use metering data to evaluate the efficacy of these messages. During the event of drought and any restrictions to supply, We will align communications with the incumbent companies to ensure that all customer experience equal restrictions.

3.3 Leakage and Unaccounted for Water (UFW)

Some degree of leakage from the distribution network is unavoidable. It may occur from storage facilities, transmission mains and distribution mains (often called 'distribution' or 'company-side' losses) or from service connections up to the customers' meter (sometimes called USPL or 'Underground Supply Pipe Leakage'). The latter are also referred to as 'customer-side losses'.

Leakage is normally the largest component of losses from a water supply system, but it is not the only component. Illegal connections may constitute real losses from the system while meter inaccuracies may give rise to 'apparent' losses. Together with leakage, these 'real' and 'apparent' losses make up the 'unaccounted-for water' component (UFW).

Leakage performance can be expressed in several ways. Customer-side leakage is often expressed in litres/property/day while distribution leakage may be more appropriately expressed in m3 /kilometre/day. The former allows for different densities of housing while the latter takes account of the length of distribution main from source works to customer. Leakage is also often expressed in terms of % of water put into distribution. All these indicators can be useful for comparing the performance of similar systems although care must be taken when comparing values from different systems or areas with widely varying characteristics. In our NAV applications we have agreed target rates for "unaccounted-for-water" of 5% of distribution input. Most of this will be leakage and the terms 'leakage' and 'unaccounted-for water' are taken as synonymous in the context of their supply-demand balance. On the basis that we are constructing and operating only brand new all welded plastic systems and all supplied properties are new, water efficient and metered, UFW rates of initially (Years 1 to 9) of 3% rising to 5% are expected to be achievable. Also, a proportion of our developments are high rise blocks of flats and leakage is assumed to be lower than traditional residential developments, maybe as low as 1%.

However, as the network ages, leakage rates are likely to rise but the rate of increase is difficult to predict. We are developing systems to assess UFW more accurately and will use this data in future WRMPs once we are confident of its robustness. We have assumed that we will be able to maintain distribution losses at less than 5% of distribution input towards the end of the planning period. This target for UFW includes a small % for meter inaccuracy. Apparent losses will not be seen until metered data becomes available so are not currently included in the plan.

We have contracted WRc to carry out an estimate of Unavoidable Annual Real Losses (UARL) with the UKWIR recommended estimates for assessing leakage in good condition networks[1], and these results have been used for the purposes of planning. There are several incumbent companies near the assessed UARL level, so this is seen as a very reasonable expectation for a new network to be maintained at. We do not own or operate any pipeline systems older than 1 year; as we mostly deploy pipes made from MDPE or HDPE, with quality controlled welded joints to connect pipes, we believe we can achieve very low levels of leakage. To maintain this, we will regularly send teams out to visually inspect the region identifying areas of wet ground for potential leaks. We, along with other NAV companies, are also in the unique position of having boundary meters and all properties within the inset metered. This enables us to actively monitor any losses with real data rather than models of assumption. Any anomalies can be investigated and rectified. We will also look to adopt a leakage maintenance strategy as the network ages where we will use acoustic techniques to help identify and rectify leaks. As stated previously, all the sites are at an early stage of development and the connected population is initially low. Meaningful assessments of unaccounted-for supply pipe background leakage and operational usage will therefore be difficult to make until several years of operational metering

[1] UKWIR 2011 Managing Leakage

data are available; in the meantime, regular monitoring of demands and trends in readings from bulk meters will continue.

The Diehl metering technology employed will provide for close management of night flows through the meters enabling the rapid identification of changes in patterns of use or potential bursts in the system. Domestic leakage can be detected by leakage alarms triggered during meter reading downloads on routine drive-bys. When development on each site becomes significant, an assessment of the company's Sustainable Environmental Level of Leakage (SELL) will be undertaken as well as the impact this has on the supply/demand balance if leakage were to rise to this level.

3.4 Target Headroom

Headroom is a planning allowance that is used to provide a buffer in the forecast supply demand balance. Target Headroom is defined as follows (UKWIR 1998), "The minimum buffer that a prudent water company should allow between supply (including raw-water imports and excluding raw-water exports) and demand to cater for specified uncertainties (except those due to outages) in the overall supply-demand balance. Introducing this into the overall supply-demand balance will help to ensure that the water company's chosen level of service can be achieved."

Available headroom is the difference between demand and WAFU (the water available for use) at any given time. It will vary with time as demand increases, new supplies are brought on-line to meet increasing demand and uncertainty increases the further into the future you go. If Available Headroom is greater than or equal to Target Headroom, then the desired level of service should be achieved. If Available Headroom falls below the target value, the water company will face the risk of not achieving its stated level of service. We have used a value of 5% for these sites which reflects uncertainty in demand.

3.4.1 Effect of Climate Change

An increase in target headroom resulting from climate change has not been added to our supply model, since the water is supplied by a point of connection to an incumbent water supply. The agreed bulk supply agreements will not change because of climate change and the contracted quantities are not restricted by a change in demand which is a consequence of climate change.

4. Details of the Water Resources Zones

4.1 Introduction

The methodology and assumptions used to construct the supply-demand balance are described in section 3. However, the balance itself is different for each WRZ and some of the values used to estimate demand also vary. The detailed supply-demand balance for each WRZ is discussed in the following sub-sections. Our WRZ's are aligned to the incumbents, however in this plan no incumbent resource zone contains more than one ESPW site.

This will change shortly when new sites come online i.e., two ESPW sites within the United Utilities Strategic WRZ and two sites within Yorkshire Water's Grid WRZ will come into effect shortly.

As previously discussed, all the sites discussed here are bulk supplies, with agreements made in perpetuity to ensure continuity of supply. All domestic and non-domestic properties are new and will be fully metered, with no unmetered properties.

4.1 United Utilities Strategic WRZ

Only one site is included here within this water resource zone, however a subsequent variation has since been granted following the cut-off date for inclusion in the planning tables of this draft plan. The United Utilities Strategic resource zone is assessed as having a low baseline risk, potentially increasing to medium risk if the Severn-Thames Transfer were to be implemented.

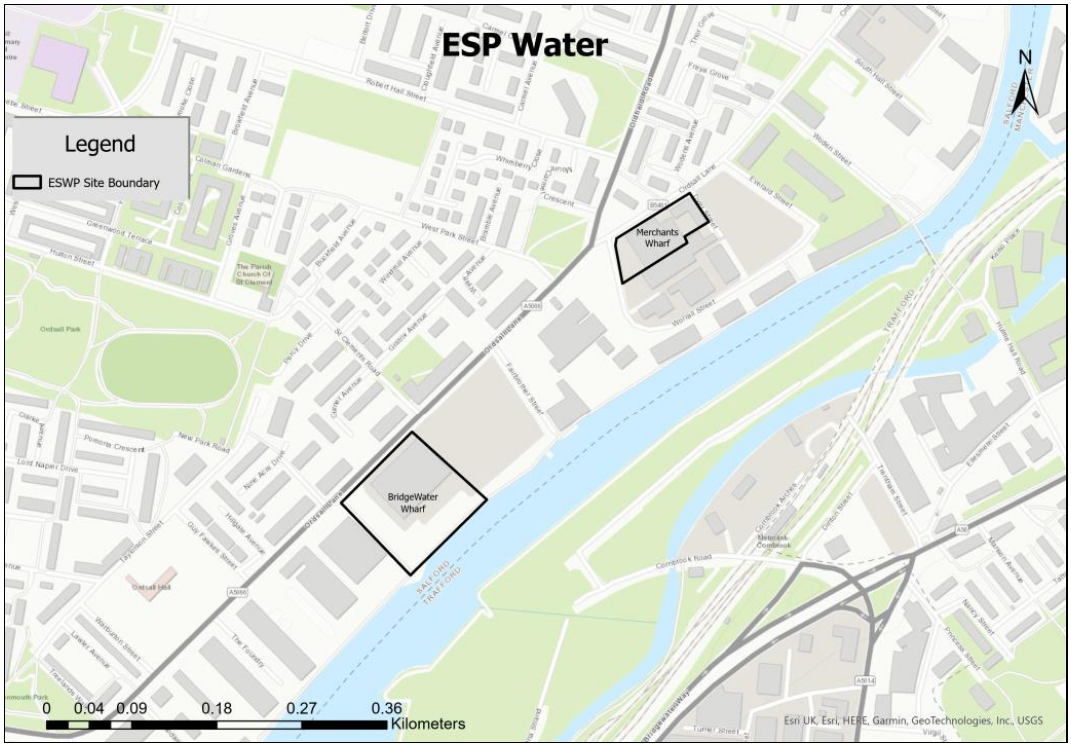
4.1.1 Merchant's Wharf

4.1.1.1 Introduction

Merchant's Wharf is situated in the United Utilities region. The development is 0.46 hectares and is a high-rise development will have 196 properties. There will be one non-household customer on the development. The site has been assessed as having a very low flood risk, is on a brownfield site and has no environmental concerns.

The new network will consist of new polyethylene (PE) pipes and, in line with government policy, all properties will be metered. All meters will be Diehl AMR enabled meters, enabling frequent meter reads to be made. The location and scope of the development is shown in Figure 4.1.1. This is very close to another future ESPW site – Bridgewater Wharf, however since this has very recently been granted it is not included in this draft plan.

Figure 4.1.1 Location of Merchant's Wharf development



4.1.1.2 Incumbent information

The site is situated within the United Utilities region in the Strategic Resource Zone. Bulk supply agreements have been reached with United Utilities to supply the properties with 28105m^3/year indefinitely. United Utilities have confirmed that the receiving Wastewater Treatment Works is Salford WWTW and that they can take the FFT (Full flow to treatment). The site has separate foul and surface water networks and three SuDs attenuation tanks that can hold a 1 in 100-year storm plus climate change.

As described previously our level of service and potential mitigation measures in the event of drought are aligned to the incumbent company. As a result, these will be the same as United Utilities and are shown in Table 2.1. A Drinking Water Safety Plan (DWSP) has been developed for the site and there are no known significant water quality issues in the area.

4.1.2 Property Details

The overall distribution of properties in the UU-Strategic resource zone are shown below in Table 4.1.1. Specific details for sites are provided in the following sections.

Table 4.1.1 UU-Strategic WRZ Property Types

Property Type	Number – Merchants Wharf	Estimated Occupancy
1 Bed	87	2
2BF/2BT	91	3
2BS/2BD/3BT/3BF	18	3

*B-Bed, F-Flat, T-Terrace, S-Semi, D-Detached

This results in a total of estimated population of 501 people with a PCC of 125l/p/d. This independent estimation is made based on the stated water efficiency targets by the developers and the expected occupancy of the small properties.

4.1.2.1 Merchant's Wharf Property Details

The development will contain 196 properties and is forecast to be completed in 2024. Properties have not been constructed to the reduced 110l/p/d standard, so in line with buildings regulations are 125l/p/d.

4.1.3 Supply Demand Balance

As previously documented, this resource zone currently consists solely of the Merchant's Wharf development, with more sites to be added in the final version of this plan. The 196 domestic properties have been calculated to require 62.62m^3/day with an additional 0.2m^3/day for the single non-domestic property. The bulk supply agreement with United Utilities provides 77m^3/day.

Leakage has been estimated using the UARL (Unavoidable Annual Real Losses) methodology using UKWIR[2] developed values for good condition networks, this has been combined with a linear pressure correction assuming a 35m inlet. This estimate will be refined when customers move into the properties and average pressure and network performance can be assessed. Other sources of non-revenue water have not been included here due to the nature of the site.

No assumptions have currently been made with regards to void properties, however if significant voids are present then this will lead to an increased supply-demand surplus. This will be assessed using metered consumption data when available, to produce a more accurate forecast going forward in future plans.

A summary table of the balance when fully built and occupied is shown below in table 4.1.2. This is also shown graphically in figure 4.1.2. Values shown in the table are shown to decimal places, resulting in a 0.01m^3/day discrepancy.

Table 4.1.2 Preliminary Supply Demand Balance

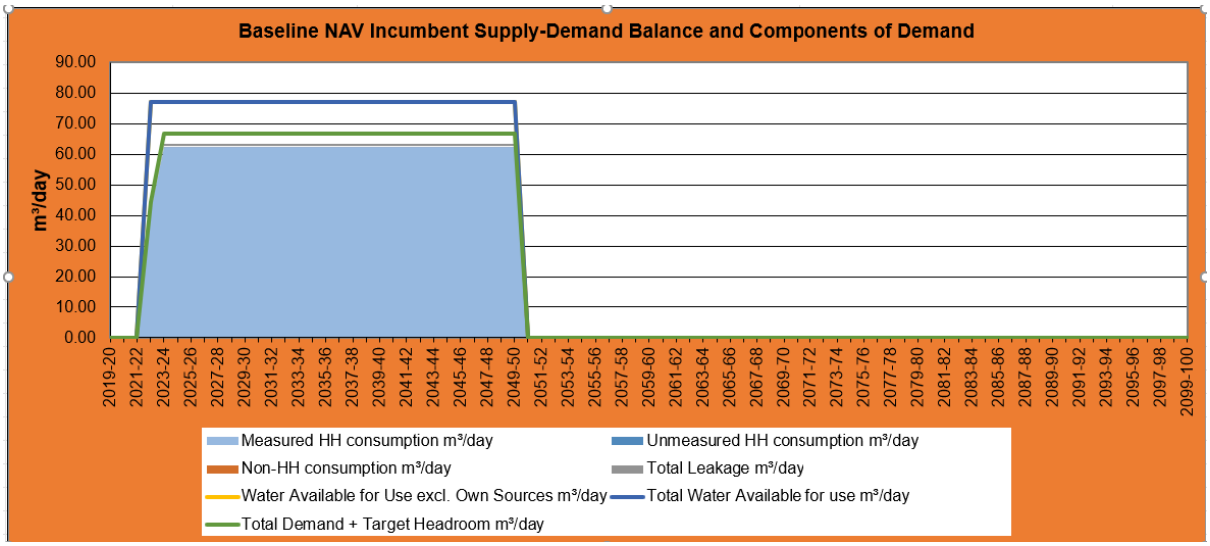
Contribution	Daily Volume m^3/day
Available Bulk Supply	77.00
Domestic Consumption	62.62
Non-domestic Consumption	0.20
Leakage	0.90
Other demand	0.00
Headroom	3.19
Total	**+10.09**

Moving forward it is expected that leakage will increase as the network ages, however this will be closely monitored using the incumbent inlet meter and individual property metering. Also, the development consists of a multi occupancy building with short lengths of mains pipe feeding the building; therefore, any leakage is expected to be

[2] UKWIR Managing Leakage 2011

low. If leakage is identified, then we will assign the appropriate resources to address any leaks rapidly. Due to the nature of the properties, there are no expectations of significantly increased demand due to climate change and this has not been assessed in this plan. Supply and demand have been forecast up until 2050 as shown below.

Figure 4.1.2 Preliminary Supply Demand Balance



4.2 Yorkshire Water Grid WRZ

Only one site is included here within this water resource zone, however a subsequent variation has since been granted following the cut-off date for inclusion in the planning tables of this draft plan. The Yorkshire Water Grid (YW-Grid) Resource Zone does have a forecast deficit below headroom, however we are confident that Yorkshire Water's proposed transfer from Northumbrian Water will address this issue.

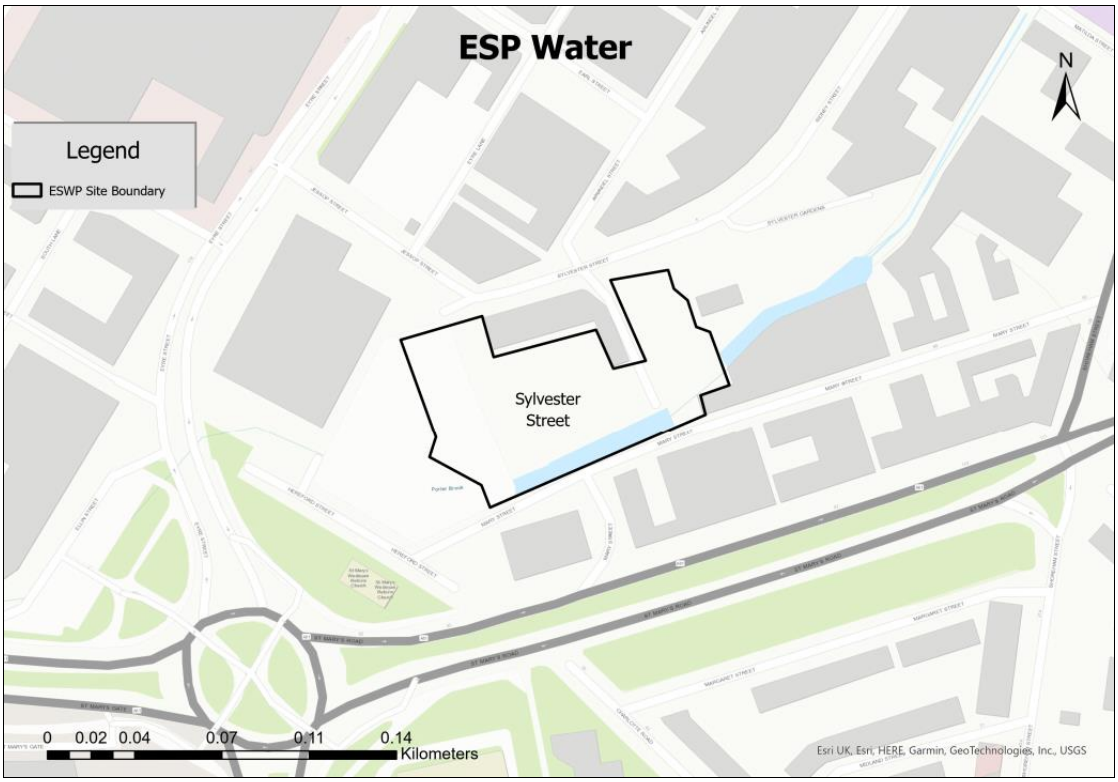
4.2.1 Sylvester Street

4.2.1.1 Introduction

Sylvester Street is situated in central Sheffield in the Yorkshire Water Region. The development is 0.65 hectares and is mid-construction and will have 335 domestic properties consisting of flats. There will be one non-household property on the development. It is a brownfield site with one portion of the site being assessed as having a high surface water flood risk. However onsite surface water drainage and storage has been put in place to mitigate this risk. There are no other environmental concerns.

The new network will consist of new polyethylene (PE) pipes and in line with government policy all properties will be metered. All meters will be Diehl AMR enabled meters, enabling frequent meter reads to be made. The location and scope of the development is shown in Figure 4.2.1.

Figure 4.2.1 Location of Sylvester Street development



4.2.1.2 Incumbent information

The site is situated within Yorkshire Water's region in the J793 DMA. Bulk supply agreements have been reached with Yorkshire Water to supply the properties with 34,352m^3/year indefinitely. The downstream wastewater treatment works is Blackburn Meadows, and no issues are expected due to the new development.

As described previously our levels of service and potential mitigation measures in the event of drought are aligned to the incumbent company. As a result, these will be the same as Yorkshire Water and are shown in Table 2.3. A DWSP has been developed for this site and there are no known water quality issues in the area.

4.2.2 Property Details

The overall distribution of properties in the YW-Grid resource zone are shown below in Table 4.2.1. Specific details for sites are provided in the following sections.

Table 4.2.1 Yorkshire Water Grid Property Distribution

Property Type	Number – Sylvester Street	Estimated Occupancy
1 Bed	229	2
2BF/2BT	88	3
2BS/2BD/3BT/3BF	18	3

*B-Bed, F-Flat, T-Terrace, S-Semi, D-Detached

This results in a total of estimated population of 776 people with a PCC of 110l/p/d and a total customer demand of 31156m^3/yr.

4.2.2.1 Sylvester Street Property Details

The development will contain 335 properties and is being constructed in FY 22/23. Properties have been constructed to the 110l/p/d standard which has been used for estimating consumption. There is additionally one commercial property on the site.

4.2.3 Supply Demand Balance

As previously documented, this resource zone currently consists solely of the Sylvester Street site in Sheffield, with likely more sites to be added in the final version of this plan. The 335 domestic properties have been calculated to require 85.36m^3/day with an additional 0.2m^3/day for the single non-domestic property. The bulk supply agreement with Yorkshire Water provides 94.1m^3/day.

Leakage has been estimated using the UARL (Unavoidable Annual Real Losses) methodology using UKWIR[3] developed values for good condition networks, this has been combined with a linear pressure correction assuming a 35m inlet. This estimate will be refined when customers move into the properties and average pressure and network performance can be assessed. Other sources of non-revenue water have not been included here due to the nature of the site.

No assumptions have currently been made with regards to void properties, if significant voids are present then this will lead to an increased supply-demand surplus. This will be assessed using metered consumption data when available, to produce a more accurate forecast going forward in future plans.

A summary table of the balance when fully built and occupied is shown below in table 4.2.2. This is also shown graphically in figure 4.2.2.

Table 4.2.2 Preliminary Supply Demand Balance

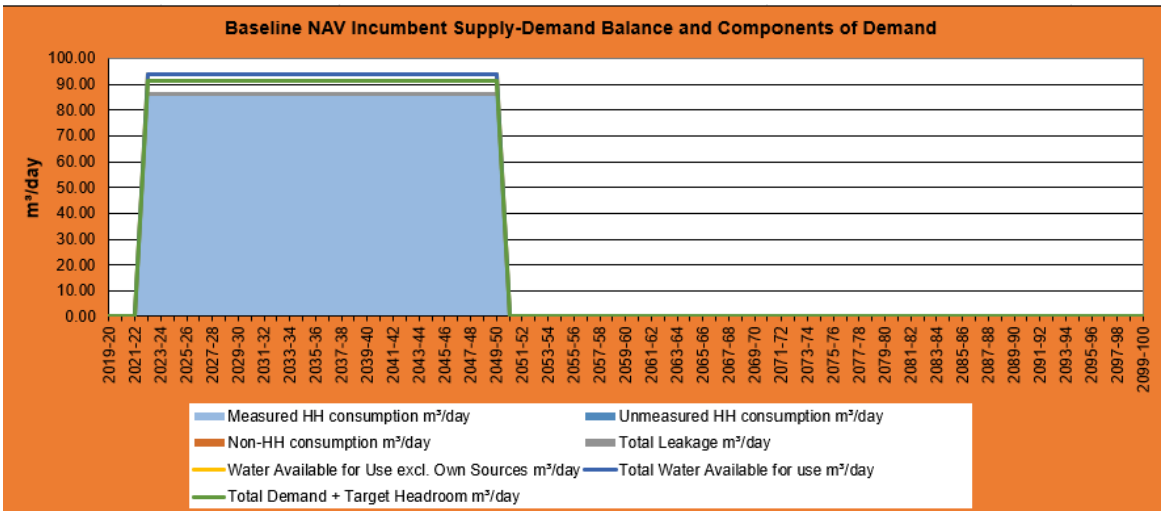
Contribution	Daily Volume m^3/day
Available Bulk Supply	94.10
Domestic Consumption	85.36
Non-domestic Consumption	0.20
Leakage	1.46
Other demand	0.00
Headroom	4.35
Total	**+ 2.73**

Moving forward it is expected that leakage will increase as the network ages, however this will be closely monitored using the incumbent inlet meter and individual property metering. Also, the development consists of a multi occupancy building with short lengths of mains pipe feeding the building; therefore, any leakage is expected to be low. If leakage is identified, then we will assign the appropriate resources to address

[3] UKWIR Managing Leakage 2011

any leaks rapidly. Due to the nature of the properties, there is no expectation of significantly increased demand due to climate change and this has not been assessed in this plan. Supply and demand have been forecast up until 2050 as shown below.

Figure 4.2.2 Preliminary Supply Demand Balance



4.3 Northumbrian Water – Kielder WRZ

Only one ESPW site is currently inside this resource zone. Northumbrian Water's Kielder resource zone has a large, predicted surplus up to 2050, so no resource constraints are foreseen throughout the current planning period or going forward.

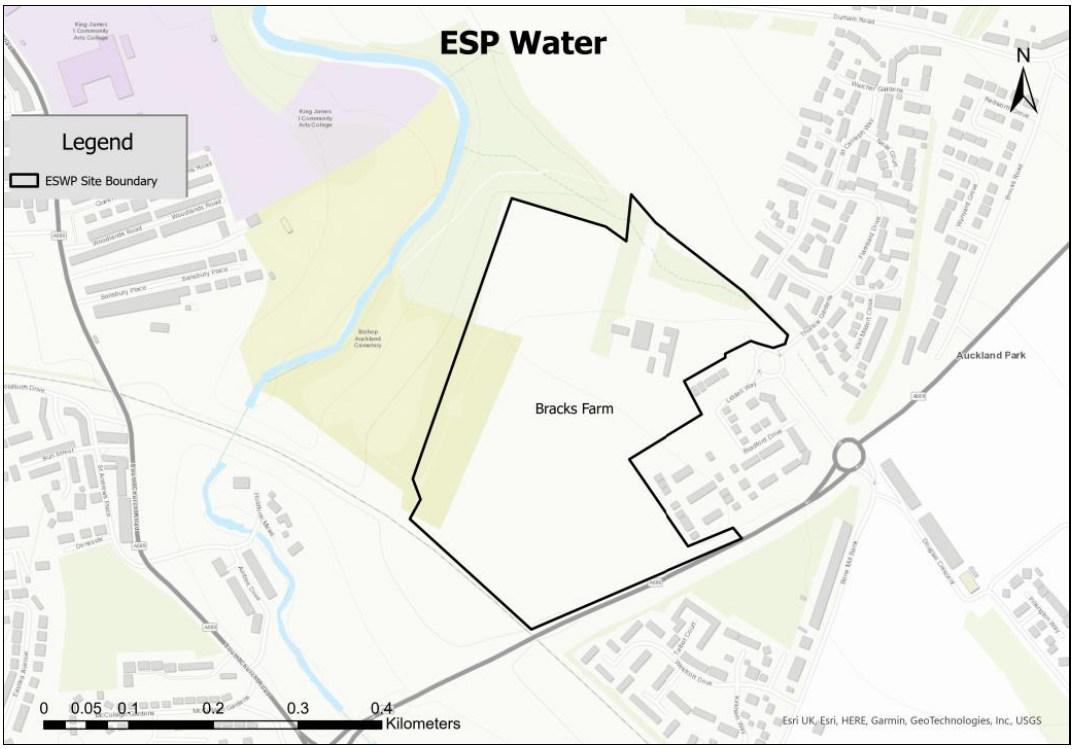
4.3.1 Bracks Farm

4.3.1.1 Introduction

Bracks Farm is situated Bishops Auckland, between Durham and Darlington in the Northumbrian Water Region. The development is 10.8 hectares and is still in the relatively early stages of construction and will have 201 houses when completed. There will be no commercial users of water in the area. The site has been assessed as having a very low flood risk and no other environmental concerns have been identified.

The new network will consist of new polyethylene (PE) pipes and in line with government policy all properties will be metered. All meters will be Diehl AMR enabled meters, enabling frequent meter reads to be made. The location and scope of the development is shown in Figure 4.3.1.

Figure 4.3.1 Location of Bracks Farm development



4.3.1.2 Incumbent information

Bulk supply agreements have been reached with Northumbrian Water to supply the properties with 36,253.80m^3/year indefinitely. Northumbrian Water has not yet confirmed the downstream wastewater treatment works. A DWSP has been developed for the site and there are no known water quality issues in the area.

As described previously our level of service and potential mitigation measures in the event of drought are aligned to the incumbent company. As a result, these will be the same as Northumbrian Water's level of service and are shown in Table 2.4.

4.3.2 Property Details

The overall distribution of properties in the NWL-Kielder resource zone are shown below in Table 4.3.1. Specific details for sites are provided in the following sections.

Table 4.3.1 Property Types

Property Type	Number – Bracks Farm	Estimated Occupancy
1 Bed	0	2
2BF/2BT	0	3
2BS/2BD/3BT/3BF	30	3
3BS/2BB	75	4
3BD/3BB	57	4
4BD/4BT/4BS	39	5

*B-Bed, BB – Bungalow, F-Flat, T-Terrace, S-Semi, D-Detached

This results in a total of estimated population of 813 people with a PCC of 111l/p/d and a total customer demand of 32,958m^3/yr.

4.3.2.1 Bracks Farm Property Details

The development will contain 201 properties and is due for completion in 2025. The distribution of properties is shown in table 4.3. Properties have been constructed to the 125l/p/d standard, however due to the distribution of property types the estimated PCC is predicted to be lower at 111l/p/d.

4.3.3 Supply Demand Balance

As previously documented, this resource zone currently consists solely of the Bracks Farm site. The 201 domestic properties have been calculated to require 90.29m^3/day with no non-household properties. The bulk supply agreement with Northumbrian Water provides 100.16m^3/day.

Leakage has been estimated using the UARL (Unavoidable Annual Real Losses) methodology using UKWIR[4] developed values for good condition networks, this has been combined with a linear pressure correction assuming a 35m inlet. This estimate will be refined when customers move into the properties and average pressure and network performance can be assessed. Other sources of non-revenue water have not been included here due to the nature of the site.

No assumptions have currently been made with regards to void properties, if significant voids are present then this will lead to an increased supply-demand surplus. This will be assessed using metered consumption data when available, to produce a more accurate forecast going forward in future plans.

A summary table of the balance when fully built and occupied is shown below in table 4.3.2. This is also shown graphically in figure 4.3.2.

Table 4.3.2 Preliminary Supply Demand Balance

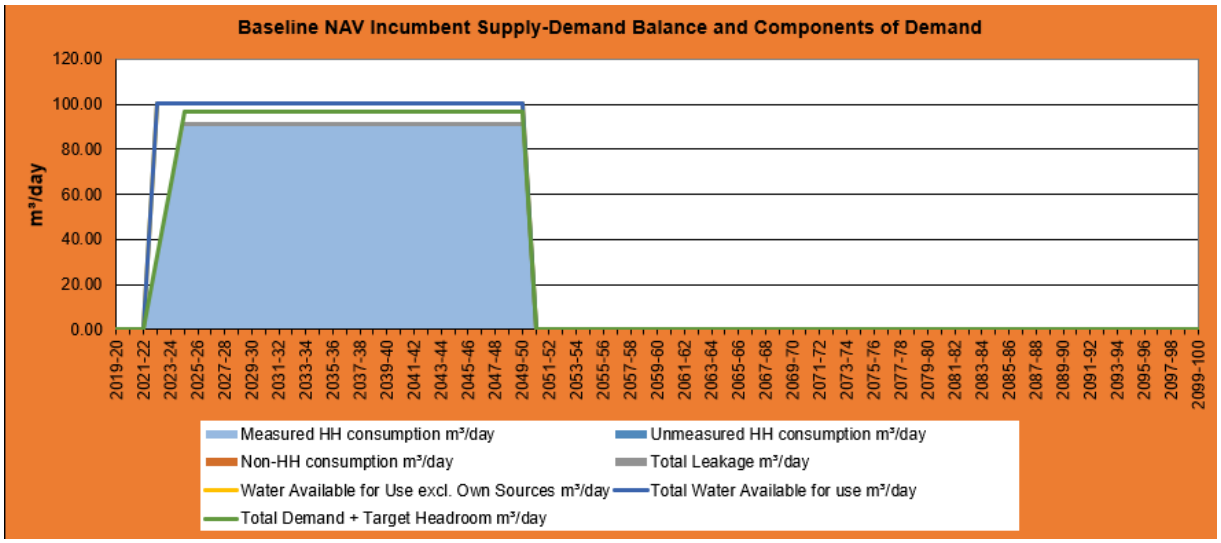
Contribution	Daily Volume m^3/day
Available Bulk Supply	100.16
Domestic Consumption	90.29
Non-domestic Consumption	0.00
Leakage	1.66
Other demand	0.00
Headroom	4.60
Total	**+ 3.61**

Moving forward it is expected that leakage will increase as the network ages, however this will be closely monitored using the incumbent inlet meter and individual property metering. If leakage is identified, then we will assign the appropriate resources to

[4] UKWIR Managing Leakage 2011

address any leaks rapidly. Given the substantial uncertainty regarding occupancy when fully operational, climate change has not been factored into demand estimates, nor have improvements in water efficiency. We do not expect any significant changes due to these variables. Supply and demand have been forecast up until 2050 as shown below.

Figure 4.3.2 Preliminary Supply Demand Balance



5. National Environment Programmes and Water Framework Directive

We will work closely with the incumbent water company as required in assessing the potential impact of licensed abstraction in designated or environmentally sensitive areas under the terms of the Habitats Directive; the Environment Agency's Restoring Sustainable Abstractions (RSA) programme, local environment programme sustainability investigations; biodiversity action plans; Catchments Abstraction Management Strategies (CAMS). However, given that we will not be operating any of its own water sources in this initial WRMP it is not considered to be a major issue requiring significant addressing within the plan.

6. Strategic Environmental Assessment

The SEA process enables all options considered by us during the formulation of the preferred strategy, to be appraised against our own environmental objectives. This process thereby allows us to demonstrate how it has considered the most environmentally favourable solutions within its overall strategy. However, while the company will work closely with the incumbent water company as appropriate, given that it will not be operating any abstraction sources it is not considered necessary to consider environmental mitigation specifically within this draft Plan.

7. Appendix 1 – Compliance with WRMP (England) Direction 2022

This table confirms which matters to be addressed in a WRMP according to WRMP (England) Direction 2022 are applicable to us as a NAV or whether a response is included in this document.

Matter – 3 (1) a-n	Section or not applicable?
a) the appraisal methodologies which it used in choosing the measures which it has identified in accordance with section 37A(3)(b) and its reasons for choosing those measures.	Our methodologies are included in Section 3.
b) for the first 25 years of the planning period, its estimate of the average annual risk, expressed as a percentage, that it may need to impose prohibitions or restrictions on its customers in relation to the use of water under each of the following (i) section 76 (**b**). (ii) section 74(2)(b) of the Water Resources Act 1991(**c**); and (iii) section 75 of the Water Resources Act 1991, and how it expects the annual risk that it may need to impose prohibitions or restrictions on its customers under each of those provisions to change over the course of the planning period as a result of the measures which it has identified in accordance with section 37A(3)(b).	An assessment of risk by incumbent area is included in Section 2.6
(c) the assumptions it has made to determine the estimates of risks under sub-paragraph (b), including but not limited to drought severity.	This is also included in Section 2.6.
d) in respect of greenhouse gas emissions - (i) the emissions of greenhouse gases which are likely to arise as a result of each measure which it has identified in accordance with section 37A(3)(b) unless that information has been reported and published elsewhere and the water resources management plan states where that information is available. (ii) how those greenhouse gas emissions will contribute individually and collectively to its greenhouse gas emissions overall. (iii) any steps it intends to take to reduce those greenhouse gas emissions.	We have included a Section at 2.8, although we consider our contribution to greenhouse gas emissions to be negligible.

(iv) how these steps will support the delivery of any net zero greenhouse gas emissions commitment made by it: and (v) how these steps will support delivery of the UK government's net zero greenhouse gas emissions targets and commitments.	
(e) the assumptions it has made as part of the supply and demand forecasts contained in the water resources management plan in respect of— (i) the implications of climate change, including in relation to the impact on supply and demand of each measure which it has identified in accordance with section 37A(3)(b). (ii) household demand in its area, including in relation to population and housing numbers, except where it does not supply, and will continue not to supply, water to domestic premises; and (iii) non-household demand in its area, except where it does not supply, and will continue not to supply, water to non-domestic premises or to an acquiring licensee.	Our supply and demand assumptions for the areas we supplied are included in Section 3, which covers (ii) and (iii), however we do not believe these assumptions will be impacted by climate change i).
(f) its intended programme for the implementation of domestic metering including— (i) the proportion of smart meters to other meters. (ii) if it does not intend to install smart meters, the reasons for this. (iii) its estimate of the cost of that programme, including the costs of installation and operation of meters;	Metering is covered in Section 3.2. We will be using AMR meters initially, but these meters are 'SMART ready' and can be linked to a Wi-Fi connection, so that a display is available in the future.
(g) its estimate of the total number of meters installed to record water supplied to domestic premises at the commencement of the relevant planning period and including a breakdown of— (i) the number of smart meters. (ii) the number of meters that are not charged by reference to volume. (iii) the number of meters that are charged by reference to volume including— (aa) optant metering. (bb) change of occupancy metering. (cc) new build metering. (dd) compulsory metering; and (ee) selective metering.	All our new properties will have AMR meters. This is discussed in Section 3.2. We will have 100% metering.

(h) its estimate of the total number of domestic premises which will become subject to domestic metering during the planning period and including a breakdown of— (i) the number of domestic premises with smart meters. (ii) the number of domestic premises with meters that will not be charged by reference to volume. (iii) the number of domestic premises with meters that will be charged by reference to volume including— (aa) optant metering. (bb) change of occupancy metering. (cc) new build metering. (dd) compulsory metering; and (ee) selective metering.	As above, we will have 100% coverage of metering.
(i) its estimate of the impact on demand for water in its area of any increase in the number of premises subject to domestic metering.	This is not applicable to us as a new NAV.
(j) its assessment of the cost-effectiveness of domestic metering as a mechanism for reducing demand for water by comparison with other measures which it might take to meet its obligations under Part III of the Act;	All our properties will be metered, however as a new NAV we cannot do this assessment.
(k) its intended programme to manage and reduce leakage, including anticipated leakage levels and how those levels have been determined.	Leakage is covered in Section 3.3.
(l) if leakage levels are expected to increase at any time during the planning period, why any increase is expected and if so, the proposed plan of works that will be undertaken to mitigate this.	This is also covered in the leakage Section 3.3.
(m) how its intended programme to manage and reduce leakage will contribute to— (i) a reduction in leakage by 50% from 2017/18 levels by 2050; and (ii) any leakage reduction commitment it has made in respect of its appointment area.	As we are a new NAV a reduction in leakage is not applicable to us.
(n) In respect of any relevant regional water resources plan— (i) how this plan has been considered and reflected in its water resources management plan; or	We are aware of the regional planning process however, due to the timing of obtaining our first appointment we haven't been involved in early regional planning discussions. We intend to in the future.

(ii) where the plan has not been considered and reflected in its water resources management plan, the reasons for this.	