United Utilities
Draft Water Resources Management Plan 2018
Consultation Events
<table>
<thead>
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<th>Item</th>
<th>Pages</th>
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<tr>
<td>Building the plan</td>
<td>3 - 12</td>
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<tr>
<td>Baseline position</td>
<td>13 - 19</td>
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<tr>
<td>Enhanced leakage reductions, plus drought permit/orders level of service</td>
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<td>Water supply resilience</td>
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<td>53 - 58</td>
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</tbody>
</table>
Introduction to the WRMP & building the draft WRMP19
What is a Water Resources Management Plan?

• We have a **statutory duty** to prepare and maintain a WRMP

• We follow **guidance** and **detailed methodologies**, which ensure a consistent framework across the industry

• It’s a detailed and robust plan to make sure we have **sufficient water available** to keep supplying our customers for the next 25 years (and beyond) and needs to:
  • Balance the needs and preferences of all our customers and stakeholders
  • Consider future uncertainty and climate change
  • Provide evidence to enable informed decisions about our proposed strategy
  • Ensure that we carry out our statutory duty to protect the water environment
  • Protect the visual amenity of the areas we live, work and play in
Stages of WRMP19 development

- Investigate and engage on new approaches / guidelines
- Verify approaches and prepare for implementation
- Pre consultation
- Complete Supply Demand components
- Appraise and develop plan
- Public consultation on draft WRMP
- rdWRMP and Statement of Response
- Final WRMP approval by Defra

- We are here
  March to May 2018

- Submission to Defra in August 2018

- If approved, expected winter 2018/19
WRMP19 submission structure

**Executive Summary**
- Introduction
- Customer & Stakeholder
- Supply system
- Baseline Position
- Options Identification
- Strategic Choices
- Preferred Plan
- Testing Our Plans
- Assurance
- Conclusions

**Main document & Executive summary**

**Customer summary & Welsh exec summary**

**Technical reports**
- Supply forecasting
- Water supply resilience
- Options appraisal
- Demand forecasting and management
- West Cumbria legacy
- Customer and stakeholder
- Target headroom
- Options identification
- Assurance and governance

**Environmental reports**
- Strategic Environmental Assessment
- Habitats Regulation Assessment
- Water Framework Directive Assessment

Supporting evidence / detail
Influences and development of the draft WRMP19

National themes – guidance / national studies / policy work

Customers and stakeholders

Three principles: Engaging...early; widely; using different or innovative techniques

Protecting and enhancing the environment

• Sustainability reductions from WINEP delivery (e.g. WFD, Habitats Directive)
• Non-yield impacting WINEP schemes (e.g. Eels Regs, WFD etc.)
• SEA / HRA / WFD assessment and environmental/social costs of plan options – embedded in WRMP process
Building our plan

Other water resources considerations, e.g. customer / stakeholder views on leakage reductions, environment etc.
Innovations to assess drought risk / resilience

• We use computer models to estimate the frequency that we will cross the different Drought Triggers and our level of drought resilience

• Droughts are rare so we have used very long hydrological time series to predict risk with greater confidence
  • Historic record < 100y
  • Synthetic record > 17,000y

• We have developed innovative new tools and techniques to support plan development, particularly to support planning for more severe/extreme droughts

• Return periods are subject to uncertainty, and best referred to in % annual risk terms
Options identification

Environmental and social costs are included in appraised options
Changes to Resource Zones

WRMP19 developed to reflect implementation of Thirlmere transfer by 2022/23 (as defined in WRMP15)
Strategic choices and alternative plans

Strategic choices informed by customer / stakeholder engagement and regulatory / government objectives

<table>
<thead>
<tr>
<th>Alternative plans</th>
<th>Strategic choices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Enhanced leakage reduction</td>
</tr>
<tr>
<td>Plan 1</td>
<td>×</td>
</tr>
<tr>
<td>Continued demand management</td>
<td></td>
</tr>
<tr>
<td>Plan 2</td>
<td></td>
</tr>
<tr>
<td>Plan 1, plus enhanced leakage reduction, with improved level of service for drought permits/orders to augment supply</td>
<td>×</td>
</tr>
<tr>
<td>Plan 3</td>
<td></td>
</tr>
<tr>
<td>Plan 2, plus resilience to other hazards</td>
<td></td>
</tr>
<tr>
<td>Plan 4</td>
<td></td>
</tr>
<tr>
<td>Plan 3, plus national water trading</td>
<td></td>
</tr>
</tbody>
</table>
Alternative Plan 1 – Baseline position

(Continued demand management)
Regional demand and leakage – historic trend

**Demand**

**Leakage**

<table>
<thead>
<tr>
<th>Year</th>
<th>Demand (Ml/d)</th>
<th>Leakage (Ml/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>2,500</td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>2,400</td>
<td></td>
</tr>
<tr>
<td>1997</td>
<td>2,300</td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td>2,200</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>2,100</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>2,000</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>1,900</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>1,800</td>
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</tr>
<tr>
<td>2009</td>
<td>1,700</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>1,600</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>1,500</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>1,400</td>
<td></td>
</tr>
</tbody>
</table>
Baseline supply-demand position

- Supply-demand forecasts reflect full update using latest data and methods.
- The baseline position also reflects continuation of significant ‘demand management’ activity
- Effective demand management is key to balancing supply and demand and includes:
  - Managing leakage
  - Promotion and implementation of customer metering
  - Promotion of water efficiency with customers

Leakage

- A significant level of resource is involved in managing and achieving existing target levels, and without this, leakage would rise significantly. This includes investment in infrastructure as well as in personnel who detect and repair leaks
- The previous 2015 WRMP maintained our leakage target at 463 ML/d through the planning horizon (2015-2040)
- The baseline adopts the lowest of the following:
  1. Sustainable Economic Level of Leakage (SELL)
  2. 3-year average leakage performance FY15-FY17
- Baseline regional leakage forecast is 448 ML/d, 3% lower than the WRMP15 level (3-year average outperformance), before any further plan choices / options applied...
Metering

• Customers with a meter typically use less water than those without one
• Currently around 40% of household customers are on a water meter
• Compulsory metering of new premises was introduced in 1990, and customers have a right to opt for a meter to be fitted for free
• We forecast between 2020 and 2025 to install 180,000 water meters (modelling by Artesia Consulting)
• By 2045 we forecast that 76% of households will have a water meter
• Meters are an essential part of our strategy to manage and reduce demand for water in the longer term
• Currently piloting “Price Promise” where customers can switch to a meter without the risk of their bills increasing; potential to remove initial barriers or disincentives to opt
• All new meters installed are AMR (automatic meter reading) enabled
Water efficiency

• At WRMP15 we committed to achieve 1 litre per property per day efficiency savings, and propose to maintain this target for this draft plan (equivalent to ~3.5 Ml/d reduction / year)

• Currently delivered by a wide ranging water efficiency campaign including customer education, supplying water efficiency gadgets, free water efficiency visits to customers homes

• Water efficiency initiatives and research, examples:
  • Customer engagement highlighting the need to communicate in a personal way, and target different segments of the population in different ways
  • Development of United Utilities online account management tool to change behaviour and encourage more efficient use of water (this is due for launch in June 18)
  • Use of targeted campaigns on social media to encourage customers to order free water efficiency devices via our website

We are currently assessing our targets against the goals in the Government’s 25 Year Environment Plan
PCC and metering forecasts

Water efficiency and metering

- Per Capita Consumption (l/h/d)
- Households Metering Penetration (excl. voids)

- PCC from "base year"
- PCC in "dry year"
- Reported
- Forecast
Our baseline supply-demand balance for draft WRMP19

- Subject to change for revised draft WRMP19
- Position BEFORE further plan choices applied...
Strategic choice: Enhanced leakage reductions and improved levels of service for drought permits / orders

(Alternative Plan 2)
Considering enhanced leakage reductions

• Leakage reductions can both enhance the supply-demand balance, whilst offering other supplementary benefits

• There is a cost to reducing leakage further (we are below the SELL), which needs to be balanced with customer affordability and other business investment requirements

• We continue to explore innovations to make our leakage management activities even more cost-effective. We expect reductions to become increasingly cost-effective over time.

• Example feedback / guidance relevant to leakage reductions:
  • Leakage frequently ranks highly as a priority in customer research / engagement (e.g. leakage WtP research showed over 90% of customers believe it is important for us to reduce leakage)
  • Ofwat have specifically challenged companies to reduce leakage by 15% in AMP7 (2020-2025), or otherwise justify why this is not appropriate
  • Pre-consultation, business plan and other engagement with regulators and stakeholders shows this to be a priority area
  • Customer research showed willingness to pay in this area, with our innovative programme choice experiment supporting a reduction of 44 Ml/d (~10% reduction)

• We continue to explore this area as we move to revised draft WRMP19 and our business plan submission
Deciding on leakage forecast for draft WRMP19

Step 1  calculate the baseline for leakage
- Use of 3 year rolling average position
- In line with Ofwat requirements

448 ML/d

Step 2  Assess the Sustainable Economic Level of Leakage (SELL).
- Determine if this is a driver for reducing leakage
- Consider benefits of related schemes, e.g. pressure management
- Adopt as baseline if lower

463 ML/d (as WRMP15 target)

Step 3  Determine company strategy / aspirations using customer / stakeholder views
- Explore customer willingness to pay (and affordability)
- Consider regulatory aspirations, customer and stakeholder views

Step 4  Complete options appraisal (if required), and consider further leakage reduction for WRMP19
- Selection of options through options appraisal where cost-beneficial / part of best-value plan
- End position defines target (updated in consultation if required)
What have we proposed in draft WRMP19?

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>2024/25</th>
<th>2029/30</th>
<th>2044/45</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total leakage (Ml/d)</td>
<td>448.2</td>
<td>418.2</td>
<td>398.2</td>
<td>368.2</td>
</tr>
<tr>
<td>% reduction from dWRMP19 baseline</td>
<td>0%</td>
<td>7%</td>
<td>11%</td>
<td>18%</td>
</tr>
<tr>
<td>Ml/d reduction from dWRMP19 baseline</td>
<td>0</td>
<td>30</td>
<td>50</td>
<td>80</td>
</tr>
<tr>
<td>% reduction from AMP6 commitment or WRMP15 target</td>
<td>3%</td>
<td>10%</td>
<td>14%</td>
<td>20%</td>
</tr>
</tbody>
</table>

NB: Reductions are to be achieved over the full AMP (5-year) period via profiled delivery.

£0.68 maximum annual bill impact
Why have we proposed these reductions in draft WRMP19?

- Plan designed to be “the most cost-effective, sustainable long-term solution” (plan assurance)

- Factors balanced:
  - Draft WRMP19 supply-demand balance position and SELL
  - Customer and environmental benefits
  - Customer engagement outcomes (finely balanced CBA) & affordability
  - Cost-effectiveness of delivery pace (increasing innovations to deliver step-change)
  - Stakeholder and regulator feedback

Customer and stakeholder research has shown that this is considered a priority area and they want us to do more. There is customer willingness to pay for leakage reductions, but these are finely balanced with corresponding costs. Our customer ‘programme choice experiment’ showed a 44 Ml/d willingness to pay on bills.

We set out long-term aspirations to reduce leakage further by 80 Ml/d over the next 25 years, but at a pace customers can afford. We propose reductions of 50 Ml/d by 2030, with 30 Ml/d of these by 2025. Completing the reductions in stages allows us to achieve this in a more cost effective manner by allowing us to implement new innovations over time.

<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>£</th>
<th>£</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Continued demand management</td>
<td>0</td>
<td>0</td>
<td>No Significant Change</td>
<td>No Significant Change</td>
</tr>
<tr>
<td>2</td>
<td>+ enhanced leakage reduction and improved LoS for drought permits to augment supply</td>
<td>46.7</td>
<td>0.68</td>
<td>++++</td>
<td>+</td>
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## Draft WRMP19 – Balancing reliability with innovation

<table>
<thead>
<tr>
<th>Period</th>
<th>Focus on reliability with some innovation</th>
<th>2020-25</th>
<th>2025-30 Balance of reliability and innovation</th>
<th>2030-35 Innovation</th>
<th>2035-40 Innovation</th>
<th>2040-45 Innovation</th>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Reductions from baseline</td>
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<td>18%</td>
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</table>

- **2020-25**
  - Focus on reliability with some innovation
  - Leakage reduction through additional find/fix and pressure optimisation
  - Reduce leakage and improve water efficiency by identifying customer side leakage and use patterns
  - 28MI/d (UU)
  - 2MI/d (third party)

- **2025-30**
  - Balance of reliability and innovation
  - Pressure reduction in distribution network resulting in leakage reduction and reduced open-tap demand
  - Reduce leakage and improve water efficiency by identifying customer side leakage and use patterns
  - 10MI/d (UU)
  - 10.5MI/d (third party)

- **2030-35**
  - Innovation
  - Temporary logging of large customers
  - Proactive monitoring of all household meters to identify and fix supply pipe leaks
  - Splitting DMAs
  - 4MI/d (UU & third party)
  - 4MI/d (UU & third party)
  - 2MI/d (UU & third party)

- **2035-40**
  - Innovation
  - Reduce leakage and improve water efficiency by identifying customer side leakage and use patterns
  - 10.5MI/d (UU & third party)

- **2040-45**
  - Innovation
  - Enhanced logger verification
  - Temporary logging of large customers
  - 8MI/d (UU & third party)
  - 1MI/d (UU & third party)

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How important do you consider:

5. Reducing the amount of water that leaks from our pipes?

Working on your behalf

We’ve cut the amount of water that leaks by 50% since 1993.

The challenges we face

We currently take 1,700 million litres of water per day from reservoirs, rivers and underground sources. However, 448 million litres of this leaks back to the environment. If we reduce this even further, then less water would need to be taken from rivers, lakes and reservoirs which could bring benefits for wildlife – particularly in dry periods when river levels are low.

Until now, we’ve balanced the costs of reducing leakage against other ways of ensuring that we have enough water available at the lowest possible cost.

What you’ve told us so far

We’re aware that you care about reducing leakage – even when this is going to cost more.

When we’ve spoken to home and business owners about their willingness to pay for a further reduction in leakage from our network of pipes, around 80% routinely say that they’re willing to pay for improvements.

However, we don’t suffer from a shortage of water in the North West to the same extent as other regions in Britain and – consequently – reducing leakage has historically been a lower priority for us.

What we’ve achieved so far

We delivered a particularly good performance against our leakage targets in the year to April 2017. In short, we beat our targets for the year and achieved our best ever leakage performance.

But our leakage is relatively high compared to other regions.

We’re constantly looking for new ways to reduce leakage without a major bill impact. We aim to strike the right balance between the cost of looking for and repairing those hard to find, minor leaks from pipes against the cost of not fixing them.

Our objectives and plans

In the short term, major changes to the amount of water that leaks are likely to mean bill increases. This is mainly because of the expense of detecting and fixing smaller and more difficult to find leaks. We are proposing a 7% reduction in leakage by 2025, with further reductions beyond then.

Reducing leakage

Currently, 448 million litres of water leaks every day.

Between 2020 and 2025, we’re proposing to reduce the amount that leaks by 7% to 418 million litres of water a day, which will add around £1 to an average annual bill.

We could reduce the current leakage levels by 10% to 400 million litres per day at an additional cost of approximately £2.

Or we could reduce the total by 15% to 378 million litres per day, which would cost around £3.

Alternatively, we could cut the amount of water that leaks by 40%, which will add around £13 to an average annual bill.

• Should we reduce the amount of water that leaks by around 7%?
• Should we target a reduction of around 10%?
• Should we aim to cut this number by around 15%?
• Or should we attempt to reduce leakage by around 40%?

Your options

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- Should we target a reduction of around 10%?
- Should we aim to cut this number by around 15%?
- Or should we attempt to reduce leakage by around 40%?
Drought Permits
Taking more water from water sources such as rivers, lakes and reservoirs during drought.

- All water companies have a licence to take water from rivers, lakes, boreholes and reservoirs for public water supplies.
- During a drought, UU may need to take more water than normal and will have to apply to the Environment Agency for a ‘drought permit’.
- Water sources are likely to already be stressed due to drought conditions and may be showing low water levels.
- Drought permits may adversely impact the environment, such as habitats for plants and wildlife.
- There may also be impacts to the appearance, recreation or business use of the water source (e.g. lake cruises). In some cases this may impact on tourism or the local economy.
- In some cases drought permit sites are located in protected environmental locations and/ or in National Parks.
WRMP15 commitment to explore improved LoS

EA request to consider applying for drought permits only once TUBS are in place

Some stakeholders have strong views on the frequency (and/or the consequences) of drought permits

Lower level of customer acceptability than TUBs, but still seen as relatively low priority for investment compared to other service areas

Customer choice experiment showed appetite for only small / marginal improvement (1 in 24 years)

More traditional / limited Willingness to pay methods showed support for improvement to 1 in 40 years (sufficient to cover costs)

WRMP19 proposal

Consult on an improvement to improve LoS to 1 in 40 years (2.5% annual chance)

If this goes ahead will involve creation of a new “drought trigger 5” in future WRMP / Drought Plan

Apply from 2025 (following 1st tranche of leakage reductions, offsetting lost water from later point of drought permit implementation)
Drought resilience and baseline / existing levels of service

Drought resilience (emergency drought orders – standpipes/rota cuts/bowsers): New focus driven by government and regulators:

- WRMP scenario with emergency drought orders 1 in 200 years or 0.5% annual risk (Defra reference LoS)
- Forecast actual levels of service over the 2020-45 planning period (Defra directive)
- Populate a new “Drought links” WRMP table to assess supply availability under severe / extreme drought

- Resilience level is high – currently estimated at being resilient to a 1 in 1000 year (0.1% annual chance) event. Strategy is to **protect** our drought resilience in future (e.g. following other interventions or under water trading).
- Whilst resilience is high, we recognise stakeholders have concerns on the consequences of drought interventions

**Temporary Use Bans (Hosepipe Bans):** No customer support to invest to specifically improve this element of Level of Service; seen as a relatively low business priority
<table>
<thead>
<tr>
<th>Event Description</th>
<th>Frequency</th>
<th>Annual Average Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water use restrictions and drought permits to augment supply on average</td>
<td>once in 20 years</td>
<td>(5% annual average risk)</td>
</tr>
<tr>
<td>Drought orders to ban non-essential water use</td>
<td>once in 35 years on average</td>
<td>(2.9% annual average risk)</td>
</tr>
<tr>
<td>United Utilities considers that it is unacceptable to plan for rota cuts or standpipes</td>
<td>even during extreme drought conditions</td>
<td></td>
</tr>
<tr>
<td>Water use restrictions on average</td>
<td>once in 20 years</td>
<td>(5% annual average risk)</td>
</tr>
<tr>
<td>Drought permits and drought orders to augment supply</td>
<td>once in 40 years on average</td>
<td>(2.5% annual average risk) from 2025</td>
</tr>
<tr>
<td>Drought orders to ban non-essential water use</td>
<td>once in 80 years on average</td>
<td>(1.25% annual average risk) from 2025</td>
</tr>
<tr>
<td>United Utilities considers that it is unacceptable to plan for rota cuts or standpipes</td>
<td>even during extreme drought conditions</td>
<td></td>
</tr>
</tbody>
</table>
Strategic choices: Water supply resilience to hazards other than drought

(Added under Alternative Plan 3)
Resilience to non-drought hazards

Background

- Defra guiding principles and WRMP planning guideline now promote and require specific consideration of non-drought hazards to water supply
- Some companies have completed a more limited assessment of water supply resilience in their WRMP (e.g. non-drought resilience of the options, rather than system)
- Our WRMP presents a wider, system view of water supply resilience before and after the preferred plan has been applied
- ‘All hazards’ assessment completed, identifying 8 that are most relevant for water supply and summarised in the WRMP; this aligns to our Business Plan activity
- Our WRMP consults upon the solutions to address the highest resilience priority
Managing resilience risks

**Resistance**
A new wall keeps the flood away and keeps the water supplied

**Redundancy**
A second pump keeps the water supplied when the first is flooded

**Response and Recovery**
A temporary tanker keeps the water supplied

**Reliability**
Even under water the pump keeps the water supplied
Resilience to non-drought hazards

What are we proposing?

- Resilience ranked high priority in customer and stakeholder research
- Already investing around £220 million in targeted resilience improvements (AMP6). Programme of future resilience investment to be delivered at a pace customers support and can afford, as part of our business planning processes.
- Ambition to minimise large scale service failures of >12 hours duration.
- Approx. 1/3 of customers face a resilience risk in excess of this ambition. However, risk is still very low.
- We have assessed resilience needs down to demand management zone level. Risks tackled on programme prioritised basis over planning horizon.
- For draft WRMP19, Manchester and Pennine resilience is a key focus area due to the scale of the risk (next two slides).
Manchester & Pennines resilience risk arising from regional aqueduct

Current situation

Service impacts over the next 10 years...

- Water quality risk
  - 1.2 million homes could be affected for 1 week or more

- Supply interruption risks
  - 240,000 homes could be affected for up to 2 weeks
  - 120,000 homes could be affected for up to 3 months

Other events unrelated to Manchester & Pennines resilience risk for comparison

- Almost certain: Discoloured water affecting 200 homes for a day
- Likely: Hosepipe ban affecting 2.7 million homes for 3 months
- Probable: Carlisle floods affecting 2,000 homes
## Options summary

<table>
<thead>
<tr>
<th>Option A: Target repairs of the two tunnel sections that are in the worst condition</th>
<th>Option B: Rebuild the tunnel section that is in the worst condition and provide targeted treatment for water quality</th>
<th>Option C: Build 5 new water treatment works</th>
<th>Option D: Rebuild all tunnel sections</th>
<th>Option E: Rebuild all tunnel sections and provide additional water sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>This option focuses on addressing the highest risk to water supply.</td>
<td>This option robustly addresses the highest risk to water supply.</td>
<td>This option will treat impurities that could enter the water supply when it is flowing through the aqueduct.</td>
<td>This option addresses all water supply risks associated with the tunnels.</td>
<td>This option addresses all water supply and water quality risks associated with the tunnels.</td>
</tr>
<tr>
<td>The work required to supply customers during the rebuild would give some of them alternative water supply for the future.</td>
<td>It also addresses the highest water quality risks.</td>
<td>This gives flexibility in how we would maintain the aqueduct, because we would be treating the water after it goes through it.</td>
<td>It also addresses the water quality risks associated with the tunnels.</td>
<td>This option would enable future tunnel maintenance by providing alternative water supply whilst work is being done.</td>
</tr>
<tr>
<td>Tunnel sections will continue to deteriorate and are likely to require future intervention. Furthermore, stopping the flow of water in the aqueduct for repairs causes it to deteriorate faster.</td>
<td>Other tunnel sections will continue to deteriorate and may require future intervention.</td>
<td>This option does not address the deterioration of any of the tunnel sections.</td>
<td>The whole length of the tunnel sections would be rebuilt, including the areas that pose less risk of service disruption.</td>
<td>The whole length of the tunnel sections would be rebuilt, including the areas that pose less risk of service disruption.</td>
</tr>
<tr>
<td>There remains a risk of service failure arising from unrepaired tunnel sections.</td>
<td>There remains a risk of service failure arising from flow being obstructed by deteriorating tunnels. This may lead to the need for future intervention.</td>
<td>There would be a small residual risk of service failure from the non-tunnelled sections of the aqueduct.</td>
<td>There would be a residual risk of service failure from the non-tunnelled sections of the aqueduct, but the additional sources would reduce this risk.</td>
<td></td>
</tr>
</tbody>
</table>
240,000 homes could be affected for up to 2 weeks

Option A: Target repairs of the two tunnel sections that are in the worst condition
Annual bill impact £2

Option B: Rebuild the tunnel section that is in the worst condition and provide targeted treatment for water quality
Annual bill impact £8

Option C: Build 5 new water treatment works
Annual bill impact £7

Option D: Rebuild all tunnel sections
Annual bill impact £11

Option E: Rebuild all tunnel sections and provide additional water sources
Annual bill impact £15
Strategic choice: National water trading

(Added under Alternative Plan 4 – Preferred plan)
National Water Trading

Background

• Defra guiding principles and WRMP planning guideline sets an expectation to collaborate and explore water transfers

• Water UK national study:
  • Significant water resources supply-demand challenges in the long-term for the South East driven by combination of climate change, sustainability reductions and growth
  • Triple-track approach advocated, including water transfers
  • North West as a potential donor region to transfer water to areas of the country with severe water shortage in future
  • Acknowledged need for further work to assess constraints and risks of options in more detail (i.e. through the WRMP process)

• High-level supply-demand scenario assessment done in WRMP15 only

• Complete assessment of potential future water trade in draft WRMP19, acknowledging this proposal would require further work in future planning rounds...
Customer and stakeholder feedback examples

Water trading

WRMP19 Customer Research - Sept 16
Participants were asked to provide their views on the idea of exporting water to other areas of the country during times of need:

“As long as we don’t suffer as a result”

“There must be safeguards in place”

“As long as it doesn’t compromise the quality of our water”

“What about the cost and environmental impact?”

It’s ‘our’ water!

Isolated or minority view

Stakeholder pre-consultation feedback – Autumn 2016
Summary of stakeholder points raised on potential trading:

Concern that there is insufficient surplus to allow a trade

Concern / want assurance to protect against detrimental impacts in the North West
Our approach to trading – listening to feedback

- We continued our ‘pathways’ approach, recognising that trading needed to be ‘explored’ further

- The supply-demand balance is benefitted separately from leakage reductions investment. This brings benefits that should be protected for the North West following this investment

- We have assessed water trading in the plan with a strategy to protecting water quality, resilience, the environment and our levels of service

- To do this, we have developed new, sophisticated methods to assess the impacts of water trading on our system, and appraise the options to facilitate it (and considered all types of options)

- We recognise in the plan that, at this stage, we do not have the full picture of how water trading will progress in the future. Our plan accepts that significant future work will be required in future to build on the strategic assessment in this plan (given it aims to address large-scale, long-term national challenges)

- Our assessment, and consultation upon it, can in turn be used to inform the ongoing national water resources planning picture
River Severn transfer (example assessed in draft WRMP19)

- When developing the draft WRMP, Thames Water were the only company to confirm a transfer from UU as a candidate option in their plan.

- Potential export to the South East would be from Vyrnwy reservoir, via the River Severn, a new raw water transfer pipeline and the River Thames. This export could be up to 180 Ml/d.

- Assumed 2035 earliest transfer.

- NB. Severn Trent Water potential interim need for a smaller water trade (post-draft WRMP19).
• Export would only occur when Thames Water is experiencing dry weather need, so source is still retained for use in the North West at other times

• Joint modelling estimates trade needed 15% of the time, so supply-demand options available for North West at other times

• Exploration of spatial coherence of drought in the WRMP to assess risks and impacts, and the solutions required
When creating our plan for trading we focussed on:

- Customer
- Cost
- Environment
- Resilience

We didn’t simply trade away our surplus.

We have considered two pathways, one without water trading and one with water trading.
Plan pathways and alternatives over time

Promote metering and water efficiency

-30Ml/d leakage
Move to 1 in 40y LoS for drought permits
-20Ml/d leakage
-10Ml/d leakage
-10Ml/d leakage
-10Ml/d leakage

AMP7
AMP8
AMP9
AMP10
AMP11

Trading preparation
Enabling works and 110.7 Mi/d supply-demand options
Assumed start for support of Severn-Thames transfer

Manchester and Pennine resilience
Address resilience needs

Non-trading pathway
Trading pathway

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No Water Trading

From 2020 onwards reduce leakage

Water Trading

Reduction in leakage

Improved level of service

Environmental benefits

Resilience enhancements

= 18% reduction by 2045
We asked you at pre-consultation in 2016 and as part of customer / stakeholder engagement your views on trading.

You told us that you wanted us to protect customer supplies, water quality and the environment. And wanted to make sure NW didn't pay for this.

We've listened to that.....
No Water Trading

Water Trading

- From 2020 onwards reduce leakage
- New options to facilitate trade = protect customers and the environment

- Equivalent reduction in leakage
- Equivalent improved level of service
- Equivalent Environmental benefits
- Equivalent resilience enhancements

Trade from 2035
Both pathways ensure
the NW has:

- Equivalent levels of leakage
- Improved level of service
- Environmental benefits
- Resilience enhancements
Defining a best-value preferred plan

- Plan designed to be “the most cost-effective, sustainable long-term solution” (plan assurance)

- Preferred plan delivers overall customer, resilience and environmental benefits

- We have balanced these improvements with affordability

- We have protected these benefits in our proposals for water trading:
  
  - A lower cost trading plan results in deterioration of drought resilience and environmental metrics
  
  - A higher cost trading plan does not meet the most cost-effective test

---

<table>
<thead>
<tr>
<th>Description</th>
<th>Cumulative supply demand options benefit (M/4)</th>
<th>Cumulative cost 80 year NPV including environmental and social cost (£0)</th>
<th>Cost</th>
<th>Maximum bill impact (impact)</th>
<th>Change in the likelihood of temporary use bans</th>
<th>Change in drought resilience</th>
<th>Change in river flows and implementation length of drought permits to augment supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline - Continued demand management</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>No Significant Change</td>
<td>No Significant Change</td>
<td>No Significant Change</td>
<td>No Significant Change</td>
</tr>
<tr>
<td>2035 leakage reductions in place</td>
<td>60</td>
<td>46.7</td>
<td>0.68</td>
<td>+++</td>
<td>+</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td>Water trading with enabling works only</td>
<td>60</td>
<td>137.1</td>
<td>Not calculated</td>
<td>No Significant Change</td>
<td>-</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Preferred plan</td>
<td>170.7</td>
<td>306.6</td>
<td>-0.40 (saving)</td>
<td>+++</td>
<td>+</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td>Example higher cost, higher performing portfolio</td>
<td>219.7</td>
<td>392.0</td>
<td>Not calculated</td>
<td>+++</td>
<td>++</td>
<td>+++</td>
<td></td>
</tr>
</tbody>
</table>

Cost to Thames Water

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Options totalling 111 Ml/d additional capacity to facilitate trading

- Options subject to change in future, including following consultation
- Trading options would be subject to further detailed environmental appraisal and drinking water quality post-WRMP19
Preferred plan summary and next steps
### Strategic choices and alternative plans

**Our preferred plan (Plan 4):**
- 1 l / prop / day / yr water efficiency
- 3% reduction in baseline leakage from WRMP15
- 7% leakage reduction by 2025
- 18% leakage reduction by 2045
- Manchester and Pennines resilience solution
- Strategic assessment of potential future 180 Ml/d trade to South East; protect resilience and environment

<table>
<thead>
<tr>
<th>Alternative plans</th>
<th>Strategic choices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Enhanced leakage reduction</td>
</tr>
<tr>
<td>Plan 1</td>
<td>X</td>
</tr>
<tr>
<td>Continued demand management</td>
<td></td>
</tr>
<tr>
<td>Plan 2</td>
<td></td>
</tr>
<tr>
<td>Plan 1, plus enhanced leakage reduction, with improved level of service for drought permits/orders to augment supply</td>
<td>X</td>
</tr>
<tr>
<td>Plan 3</td>
<td></td>
</tr>
<tr>
<td>Plan, plus resilience to other hazards</td>
<td></td>
</tr>
<tr>
<td>Plan 4</td>
<td></td>
</tr>
<tr>
<td>Plan 3, plus national water trading</td>
<td></td>
</tr>
</tbody>
</table>

Preferred plan reflects aggregation of benefits under all alternative plans.
dWRMP Next Steps

- **Publish dWRMP**
- **Produce rdWRMP and Statement of Response**
- **Submit rdWRMP and Statement of Response to Defra**
- **Final WRMP19**

- **Public Consultation Ends 25th May**
- **From May**
- **End August**
- **Early 2019?**

- **2 Mar 2018**
- **12 Weeks**
Recap on responding to our consultation


- Building on today’s event, if you need any further clarity to help provide your response, please do get in contact with us at wrmpconsult@uuplc.co.uk

- 12 week consultation period ends 25th May 2018. *We really welcome earlier feedback too, which helps us incorporate this into the updated WRMP.*

- Remember, responses need to go to Defra, EA and Ofwat, as well as UU (postal details also on website):
  - wrmpconsult@uuplc.co.uk
  - water.resources@defra.gsi.gov.uk
  - wrmp@ofwat.gsi.gov.uk
  - water-company-plan@environment-agency.gov.uk
Questions and topics to aid consultation responses

- Specific areas to consider:
  - 1. Developing our plan (approaches)
  - 2. Leakage reduction
  - 3. Drought resilience
  - 4. Level of service from drought permits and orders
  - 5. National water trading
  - 6. Preferred plan
  - 7. Resilience to other hazards
  - 8. Consulting upon the plan
  - 9. Environmental report

- Within the main report we present more specific, detailed questions with stakeholders in mind who have reviewed that document.

- We understand people need to tailor responses to their interest and involvement (e.g. review of supporting technical material)......and of course welcome ‘free response’ on our plans.
Thank you