WSX-C13 – Enhancement costs – resilience

Response to Ofwat's PR24 draft determination

Wessex Water
YTL GROUP

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Representation reference: WSX-C13

Representation title: Enhancement costs – resilience

CONTENTS

1. Summary

This representation sets out our view in respect of resilience funding for three areas:

- Cyber security
- Laboratory analysis and communications
- Climate change impacts

1.1. Cyber security

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1.2. Laboratory analysis and communications

Our proposed enhancement investment for laboratory analysis and communication is driven by new legislative and regulatory changes. We do not agree with the expectation that such investments should be covered by base allowances**.** We also consider the proposed approach in this area is contradictory to that taken at PR19 for similar enhancement investment schemes, where allowances were given to mitigate the end of the public switched telephone network.

We therefore consider our proposed allowance of £3.89m should be maintained. We have included further information about how these investments are in the best interest of customers and are efficient.

1.3. Climate change impacts

This document also sets out what schemes we intend to deliver for the enhancement 'uplift' that Ofwat has allowed for resilience to climate change impacts. While we disagree with Ofwat's approach to funding companies for resilience to climate change, and we consider that all costs and activities in our business plan submission are required to adequately improve our resilience to this growing threat, we have nonetheless presented our business case for the uplift here. Costs are included in data table line CWW3.170 (Resilience; Enhancement wastewater).

Table 1 – Summary of changes requested

Data table line	Draft Determination allowance	Our requested allowance	Further details
Cyber Security – CW3.124-126, CW3.132-133	£8.09m	£21.58m	-
Resilience Labs & Communications – CW3.118-120, CWW3.168-170	£0m	£3.89m	See Section 3 of this document
Climate change - CWW3.168-170	£11.6m*	£19.64m	See Section 4 of this document

*Sum of Ofwat's enhancement uplift allowance for climate change resilience

2. Cyber security

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3. Resilience laboratory analysis and communications

3.1. Ofwat's approach to setting allowances

3.1.1. Resilience laboratory analysis and communications

In the models provided by Ofwat (20240711 - 02e Water enhancement feeder models - 03 PR24-DD-W-–- Resilience-redacted & 20240711 - 02f Waste enhancement feeder models - 37 PR24-DD-WW-Resilience-2), Ofwat have decided, in the WSX_comms & analysis deep dives, to fail our request for enhancement investment as it is claimed that the investment does not meet the criteria for resilience investment and that there is no evidence of overlap with base allowances.

The more comprehensive response in the Waste Enhancement feeder model (the response in the water model makes no mention of the laboratories) Ofwat state the following:

The company states that this investment covers the upgrade of communication network from an outdated cellular network which is due to be phased out in the next ten years. The second part of this investment is about expanding the capacity of its laboratories, including the overall footprint, to meet additional sampling and analytics needs.

And,

It is the company's general duty to manage and maintain all its assets, including laboratories and supporting technologies such as cellular networks, so that they are able to deliver outputs as they were intended to meet. Our base expenditure is for companies to deliver resilient services on a day-to-day basis. Therefore, it is the company's duty to maintain and upgrade its communication network and laboratory facilities as required to support the continuity of service. The company does not provide sufficient and convincing evidence to demonstrate why additional allowance is required to upgrade the communication network and provision of laboratory service when these are related to day-to-day delivery of services.

We would expect a balanced approach to reference the new analytical capability required to meet the **new regulations** which are not incorporated as part of base allowances, especially those related to PFAS, Continuous Water Quality Monitoring and IED. Prior to these new regulations we have not needed to meet these outputs. We also note that the approach taken at PR24 is inconsistent with that taken at PR19, where enhancement investment was provided to manage the end of the Public Switched Telephone Network (PSTN) communication network. In this instance, the 2G cellular network is being phased out over the next 10 years, and communications providers are already reducing the 2G capacity available. This is outside of Wessex Water's control. It is not clear that these activities should be treated differently.

3.1.2. Fit of Ofwat's chosen model

Laboratory

In annexes WSX15 and WSX17 we detail our case for enhancement investment related to new regulatory requirements that have not been included as part of base investments previously. **In the case of PFAS we have a DWI Section 19 (1) undertaking dated 18 June 2024** that details the following:

- Wessex Water must conduct surveillance, including sampling and analysis for PFAS in line with the inspectorate's latest published guidance on PFAS
- Date: Ongoing for the duration of the undertaking.

Wessex Water Services Limited – AMP8 PFAS Strategy - Drinking Water Inspectorate (dwi.gov.uk)

Our laboratories are currently maintained to the current level of regulatory and monitoring analysis requirements and are at capacity. Growth in regulatory sampling from new requirements sit outside our base costs. The additional PFAS sampling alone will result in around 117,500 additional parameter results per year, a 4% increase over our total current parameter analyses in AMP8. By the end of AMP9 our total increase in newly required analysis will reach around an additional 220,000 approaching a 10% increase over our current levels, this analysis will require more laboratory space and new analysis tools not currently available in our labs.

Therefore, it does not seem possible that meeting these new regulatory requirements could be covered through existing base allowances.

2G Communications

In annexes WSX15 and WSX17 we detail our case for enhancement investment to mitigate the end of 2G communication services related to changing regulatory requirements, driven by Government legislation and outside of Wessex Water's control. At PR19 we made a similar case to mitigate the end of the PSTN service, another change driven by Government legislation that was outside of Wessex Water's control.

At PR19 Ofwat provided enhancement funding to assist the managed change we were facing related to PSTN communications. We are well on our way to spending significantly more than our allowance at PR19, some £18m compared to our £3.6m enhancement allowance.

As with this investment at PR19 we consider that the changes to the 2G communication network are outside of our control and therefore not covered as part of base expenditure.

3.2. Required adjustment to cost allowance

We request that Ofwat adjusts our allowance for laboratory analysis and communications investment to £3.89m.

3.3. Rationale

3.3.1. Laboratory

As stated in annexes WSX15 and WSX17 there are very few labs capable of managing PFAS analysis in the UK and resilience in the sector is poor. The industry has experienced issues with PFAS analysis where the only UK provider was offline for more than three weeks preventing any PFAS analysis. To mitigate the resilience shortfall, part of our lab extension will be dedicated to PFAS analysis. The remainder of the growth will lie in analysis of water quality samples to validate the continuous water quality monitors and the additional samples related to IED. As previously stated, we are not seeking the full cost to meet the laboratory expansion and will be covering a large amount in our base costs, we are only seeking the element of enhancement related to new statutory requirements which equates to around 600m^2 (primarily due to the complex and challenging requirements for PFAS analysis).

Laboratory Cost Efficiency and best option for customers

We have been working with AECOM to assess the investment required at our laboratory to ensure resilience now and in the future. AECOM have assessed the costs for the laboratory growth and provided options on delivery. These costs are comparable by m^2 to those included in the business plan and an external model from Building.co.uk when adjusted for inflation from 2015 (Cost model: Laboratories | Features | Building). We also compared the unit rate of a modular building installed at one of our sites in Sturminster Marshall.

Table 2 – Costs of laboratory build

Estimate provider	Unit Rate (£/m2)	Area (m2)	Total cost (£)
Building.co.uk	4,042	600	2,425,200
Wessex Water Modular Build	4,182	600	2,509,200
AECOM Option A	3,980	600	2,388,000
AECOM Option B	3,985	600	2,391,000
AECOM Option C	3,822	600	2,293,200
Median	*4,002*	*600*	*2,401,320*

Table 3 – AECOM total costs of laboratory upgrade

	Description	Option A	Option B	Option C	Comments
A	Substructure	208,210	129,250	90,240	
B	Superstructure	678,700	503,270	419,810	
C	Internal Finishes	530,954	475,850	430,609	
D	Fixtures and Fittings	2,160,070	2,038,750	1,772,395	
E	Services Equipment	3,146,283	2,715,061	2,549,837	
F	Work to Existing Building	218,535	178,535	188,535	
G	External Works	340,000	297,500	257,500	
H	**Sub Total**	**7,282,752**	**6,338,216**	**5,708,926**	
I	Main Contractor Preliminaries @ 15%	1,092,413	950,732	856,339	
J	Main Contractor's Overheads and Profit @ 5%	418,758	364,447	328,263	
K	**Contract Total**	**8,793,923**	**7,653,395**	**6,893,528**	
L	Design Development Risk @ 6%	527,635	459,204	413,612	
M	Construction Risks @ 4%	351,757	306,136	275,741	
N	Employer Change Risk @ 5%	439,696	382,670	344,676	
O	**Total Estimated Contract / Project Cost (ex VAT and Inflation)**	**10,113,011**	**8,801,405**	**7,927,557**	
P	Inflation Allowance to Tender Return Date @ Q3/24	291,255	253,480	228,314	
Q	Inflation Allowance to Mid-Point in Construction @ 1Q or Q2/25	283,164	179,549	161,722	*Option A assumes Mid Point in Q2/25*
R	**Total Estimated Contract / Project Cost (ex VAT)**	**10,687,431**	**9,234,434**	**8,317,593**	

The remainder of the costs were made up with the additional laboratory equipment required to meet the new analytical needs from PFAS and the additional sampling capability required to meet the continuous water quality monitoring and IED analysis. For these costs we used data from historical quotes for similar equipment replaced as part of our base maintenance.

Table 4 – Equipment costs

Lab Area	Description	Cost £)
Gen Chem	Furnace (analysis of soil organic matter)	30,000
Gen Chem	Soil drying cabinets	80,000
PFAS	Triple Quad GC/MS	200,000
Organics	Dissolved methane analyser	40,000
	Total	***350,000***

We currently have our PFAS analysis carried out externally and the costs are comparable to managing these internally. When we are operating at full capacity and analysing 2500 samples per year there would be a c£70k/year efficiency to managing these samples internally, mostly borne through reduced transport costs and time savings, this would not qualify as a spend-to-save as the payback period would be far too long. Our sole reason to provide PFAS, continuous water quality monitoring and IED analytics through our own laboratory is resilience and redundancy.

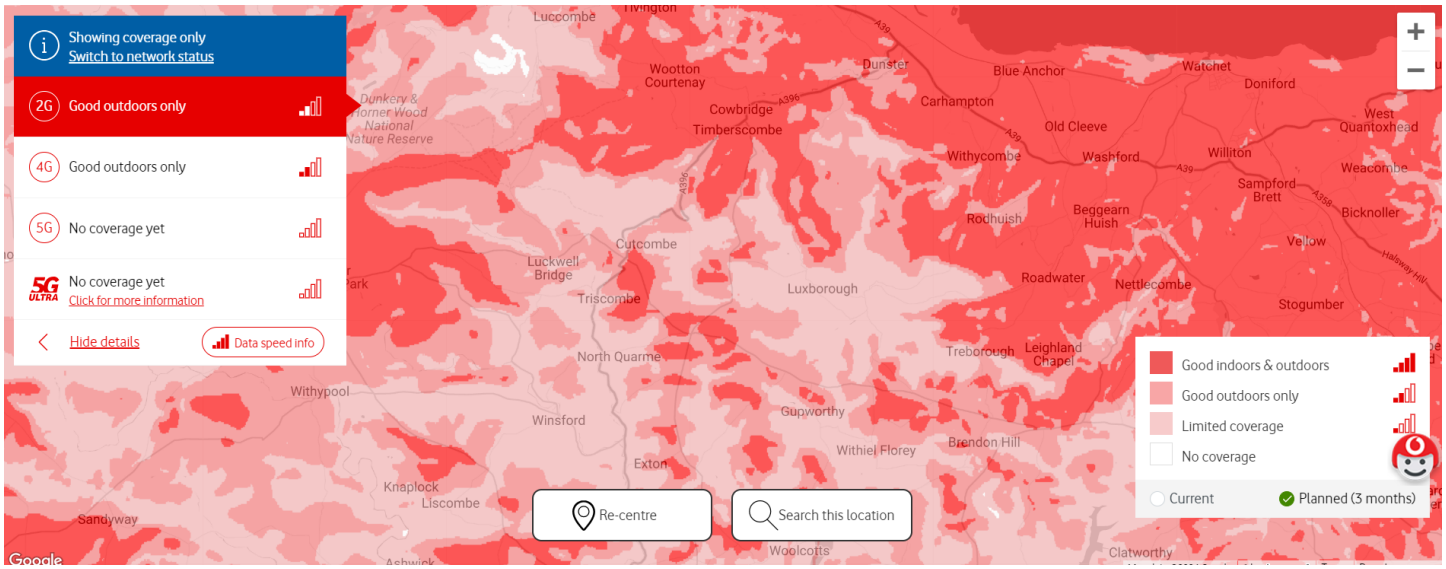
3.3.2. 2G Communications

2G Communications efficiency and best option for customers

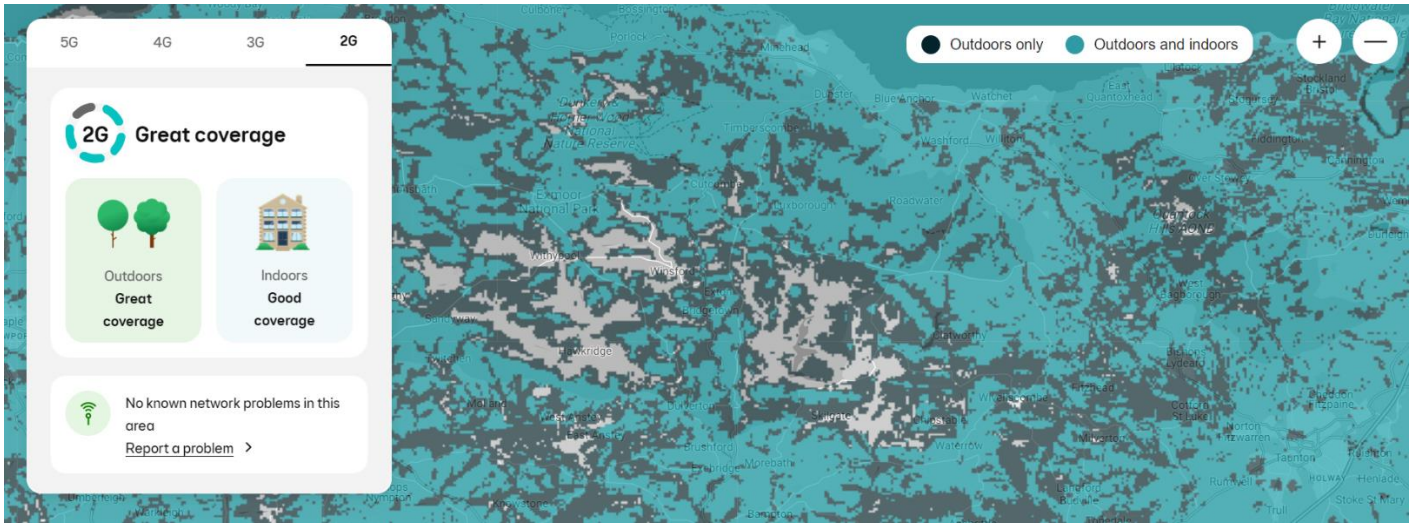
Our approach to identifying the scale and level of investment required for the mitigation of 2G aligns with our delivery approach for PSTN in the current AMP. All costs were developed with the team who have been surveying all our sites for connectivity as part of the programme. We are considering the migration well in advance of the planned network sunset in 2033 to ensure customers and employees are not impacted by this third-party change.

Our surveys have identified a number of sites within our region that will not have mobile connectivity (4G or 5G) once the 2G signal has gone. In discussion with communications providers, it is unlikely that these sites will get suitable coverage. Exmoor is one area where will experience considerable challenges. The following coverage maps from all the major cellular providers show that when 2G ends the available coverage will be vastly diminished.

Vodafone 2G coverage - Exmoor

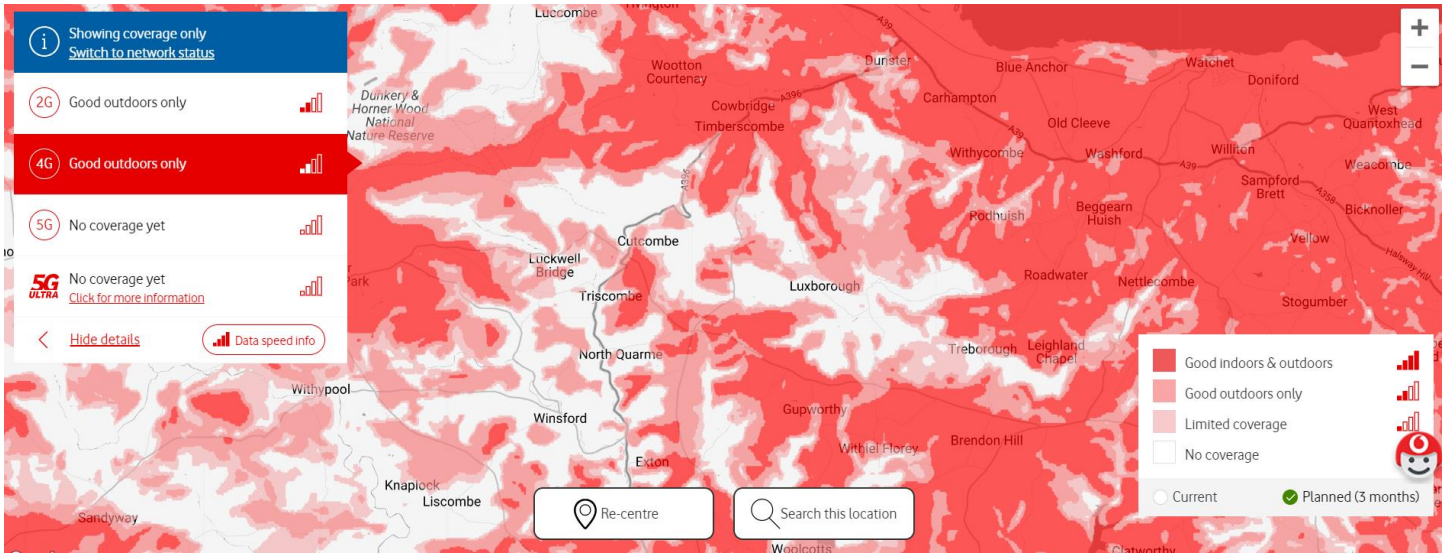


EE 2G coverage - Exmoor

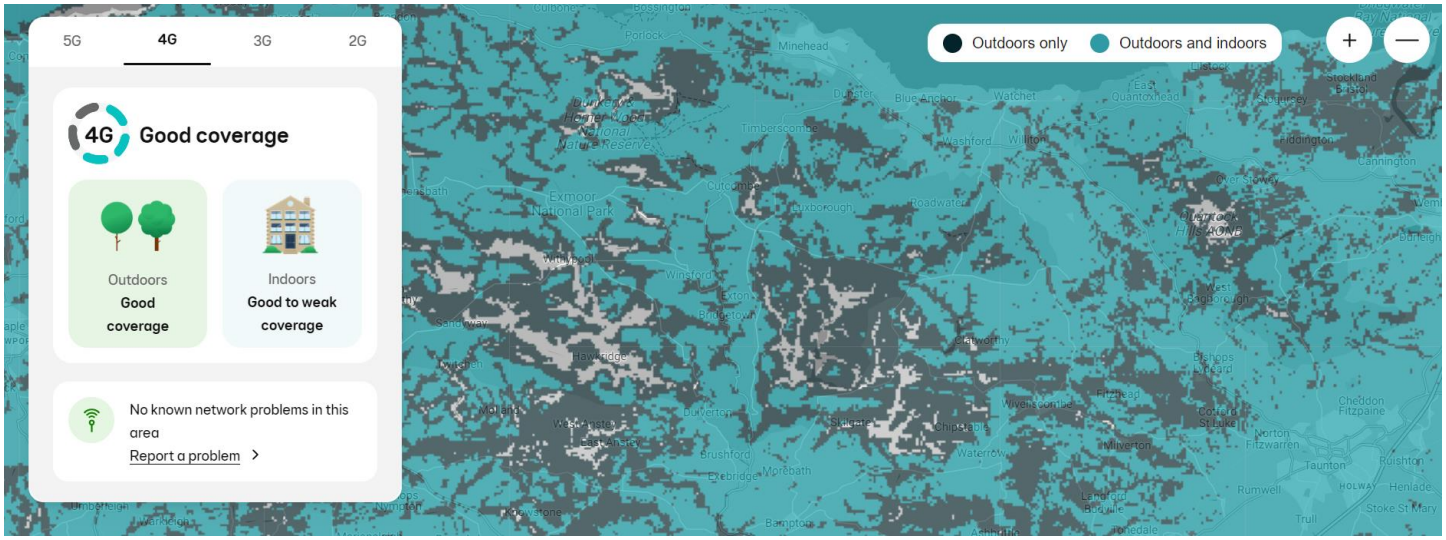


O2 2G coverage - Exmoor

Vodafone 4G coverage – Exmoor



EE 4G coverage – Exmoor



O2 4G coverage – Exmoor

The coverage will not be suitable for our health and safety lone worker system and is therefore a significant business health and safety risk. Any proposed NB-IoT solution is designed for low bandwidth packet data like that used for smart meters, not for alerting and updating lone worker systems. To ensure resiliency in communications at these remote and challenging locations we need to develop options and solutions to maintain connectivity. The recent work and report (June 2024) carried out by WaterUK in collaboration with Defra is highlighting that there are resilience issues with UK communications that are outside of water company's control. Our proposed investment is to help get ahead of the 2G switch off and the resulting challenges. We are happy to work in partnership with suppliers and other utilities to develop solutions to mitigate the end of the 2G service.

Where we are looking to replace 2 & 3G devices installed as part of the PSPS programme we have carried out a procurement exercise to identify the best cellular router solution. We have opted for a router that provides further longevity and security than those 2G and 3G routers currently installed. This supports our approach for the PSPS upgrades proposed for later in AMP8 and into AMP9.

4. Climate change resilience uplift

4.1. Overview

The draft determination includes a sector wide enhancement uplift for companies to prioritise their biggest climate related risks. This is calculated at 0.7% of modelled base allowances. The 0.7% is derived from the median value of Ofwat's view of the efficient costs in this area.

The risks from climate change affect multiple investment areas across both water supply and wastewater. Resilience in these areas is embedded across our business plan and in all our related strategic planning frameworks, including the WRMP and DWMP. We have developed our business plan in a way that puts us on a sustainable pathway to managing climate change-related risks over the long-term, and we consider all the costs and activities in our plan are required to strengthen our resilience to this growing threat.

While we welcome Ofwat's recognition of the challenges which companies face in relation to climate change, we do not consider this an appropriate way in which to fund companies to meet these challenges. Companies will each face unique challenges and their business plans will reflect these circumstances. We ask Ofwat to consider the information set out in plans and set the appropriate level of funding on a company-by-company basis.

We also note there is considerable uncertainty in Ofwat's approach. While its view of the efficient costs might be 0.7% for the median company, its view of the efficient costs for some companies is significantly above this (i.e. there is considerable variation in the values used to derive the median). For example, on the basis of the deep dives, Ofwat's view of Thames Water's efficient costs for resilience represents 8.95% of base cost allowances; and this is 7.56% for South East Water – both over ten times higher than the median.[1] It is also unclear to us whether the median company is being funded twice.

4.2. Ofwat's requirements

As set out above, we have concerns with Ofwat's approach to funding companies for resilience to climate change.

Notwithstanding this, should Ofwat maintain its approach in this area, we have set out in the rest of this section what we would expect to deliver in AMP8 in respect of climate change resilience using the proposed uplift funding, and how this meets Ofwat's requirements for this uplift. These are:[2]

- Companies must set out what schemes they will deliver for the additional uplift funding in their representations. This should include details of the schemes and why these have been prioritised.
- This should address additional flood and power resilience requirements from climate change.
- Companies must clearly identify and demonstrate, supported by sufficient and convincing evidence, the causal relationship between the increasing risks and the climate change impact.
- Ofwat expects independent third-party assurance for the resilience uplift business case.

[1] Calculated using values in: PR24-DD-W-–-Resilience-redacted.xlsm (live.com)
[2] Page 189, PR24-draft-determinations-Price-control-deliverables-appendix.pdf (ofwat.gov.uk).

4.2.1. Proposed scheme

As set out above, climate change resilience has shaped our business planning process and we included several schemes in our plan that seek to address the risks and impacts of climate change.

In respect of flood and power resilience requirements specifically, two such schemes were:

- **Flood resilience at WRCs and SPSs**. We proposed expenditure of **£5.31 million** for this in our business plan.
- **Power & standby generator resilience at WRCs.** We proposed **£19.6 million** for this in our business plan.

The enhancement costs relating to generator resilience are included in our CWW3.170 of our data tables, while costs related to flood resilience at WRCs and SPSs now form part of our revised base cost submission and are covered by a cost adjustment claim setting out why an increase in base costs is required in AMP8.

We provide further evidence below on the details of the power & standby generator resilience scheme, and how we consider it meets Ofwat's requirements. While we have presented this scheme for the purposes of this uplift, for avoidance of doubt, we consider our entire range of business plan activities is required to address climate-change related risks, and we ask Ofwat to allow us funding for these schemes.

Our case has been reviewed by a third party (Mott Macdonald) against the stated criteria in Ofwat's Draft Determination.

4.2.2. Power & standby generators at WRCs – scheme details

This scheme was developed using work undertaken as part of our Drainage and Wastewater Management Plan (DWMP). To inform our DWMP, we undertook a resilience assessment of water recycling centre (WRC) sites and sewage pumping station (SPS) – covering both flooding risk and power resilience requirements. This assessed our existing power supplies (single, dual, generator, mobile generator hook-up) at WRCs, and the resilience of our power supplies to major outages.

This identified a potential gap in our power resilience preparedness. Currently, around half of our WRCs have standby generators, covering all large sites and any with process-critical pumping, for example inlet or interstage pumping. The remaining 150 WRCs have no standby power provision. Whilst most treatment processes on these sites involve gravity flow through the works, all these sites have mechanical equipment such as inlet screens and de-sludge pumping. In the event of extended power failure, the site's treatment performance will deteriorate, and any final effluent sample taken at this time is at high risk of being non-compliant.

Relationship between the increasing risks and the climate change impact

There is an established link between the risk of extended power failure and climate change. Ofwat's climate change adaption report has identified increased risk of power outages as a medium climate change-driven risk for the water sector[3]. Our own analysis of climate change impacts and risks has identified storm events affecting power supplies at water treatment sites as having the highest risk score.[4]

[3] Ofwats-3rd-Climate-Change-Adaptation-Report.pdf

[4] Climate Change Adaptation Report. This was based on the 2012 HR Wallingford / UKWIR climate risk assessment tool.

This risk is also illustrated in Ofgem's recent report on the impact of Storm Arwen on the energy sector[5]. Storm Arwen affected most DNO networks across the country including in our region. Ofgem noted that severe weather events are likely to become more common, as the effects of the climate change are felt, so it is imperative that all DNOs are well prepared. Ofgem also identified a need for DNOs to identify options to enhance the use of mobile generators in reducing the length of power disruptions. We consider this clearly reflects the increasing risk of extended power outage due to climate change, which will affect our WRCs in the same way as any other assets with mains-connected power supplies.

Additionally, there is an interaction with associated flooding risks related to climate change, as flooding events also give rise to power outages and the need for short-term alternative power supplies. Ofwat's climate change adaption report identified increased risk of company assets flooding as a high-risk factor. There are several mechanisms through which this risk can materialise, specifically:

- Increasing storm intensity – resulting in more intense rainfall, leading to increasing flood risk.
- Wetter winters – increasing the risk of seasonal groundwater inundation leading to flooding.
- Tidal increases – which increase the risk of flooding due to submerged discharges (though we noted this is likely to be a longer-term impact (i.e. primarily beyond 2050))

This link is reflected in our long-term delivery strategy (LTDS). One of our LTDS pathways captures the impact of a high climate change scenario on our sewerage strategy. To develop this pathway, we undertook hydraulic modelling to estimate climate change impacts. Current best practice when designing hydraulic improvements schemes is to allow for known growth and a 20% increase in design storm intensities to account for climate change. Our modelling showed that for the high climate change scenario, 30% more properties would also be at risk of flooding. The scale of this increased risk would extend to our own assets such as WRCs.

Risk assessment and need for investment.

Our DWMP proposed an initial set of options to mitigate the risks associated with power failure at WRCs. Building on this, we undertook further work as part of our PR24 business plan. This was also informed by the experience of Distribution Network Operators (DNOs) not being able to maintain power during storm events. We have our own fleet of mobile generators along with service contracts with third parties for the provision of mobile generators, but power outages are often associated with storms across wide areas affecting multiple sites and at times when operational staff are stretched due to the extra pressure on our network. Recent storm events have demonstrated that existing capacity could not by itself fully mitigate the risk of power outages when such events occur.

Considering the growing risk of storm intensity caused by climate change (discussed above) and reflecting regulators' heightened expectations that companies must be resilient to such events, we identified a need to purchase generators for all remaining WRCs with numerical consents that don't have a standby generator on site. Our business plan therefore included for the provision of standby generators for all our remaining WRCs with numerical discharge permits.

In developing our business plan, we considered the optioneering assessment undertaken by Mott Macdonald for the DWMP. However, our tolerance to this risk is driven by the risk of non-compliance with discharge permits (discussed in more detail below). Given the growing risks of power outages caused by storm intensity, the provision of standby generators at relevant sites is the only way to fully mitigate this and the associated risk of pollution incidents from assets failing.

[5] Final report on the review into network' response to Storm Arwen (ofgem.gov.uk).

We considered alternative ways of powering sites, e.g. fuel cells or batteries but currently we consider these are unsuitable especially if required to power sites for extended periods of time.

Scheme costs.

In our business plan, we proposed £19.6 million for this resilience activity. This was based on actual costs of provision of generators and ancillaries on typical sites with numerical permits. We reviewed a sample of supplier quotations over 2021-22 to 2022-23, for a range of kva requirements. These quotes indicated a range of £52,000 to £85,000 for the most common generator sizes (including integral fuel tank; slab & fuel delivery area; and project overheads), with some larger generators costing significantly more than this. We applied the average cost of this range to the number of WRCs with numerical discharge permits and without existing standby generators (150 Nr) to produce an indicative cost of £68,500 / generator / site. There is also a requirement for a detailed site electrical survey at each site, which is an additional £10,000/site.

We then included an allowance for those sites that might require modifications to the Motor Control Centre and/or Mains Distribution Board, again based on recent installations (between £50-100k/site, where needed). We used a unit rate of £75k/control upgrade/site, based on 65% of those sites (i.e. just under 100) needing generators also needing modifications to other power, control and telemetry systems.

We assumed an opex of £1,700 per generator per year, and a gradual profile of generator rollout over the AMP.

Together, this means we would expect the provision of generator capacity to all remaining relevant sites would be £19.6 million. We recognise there is some uncertainty around this due to the size of the required generator at each site, but we consider that by excluding the largest generators from our estimates we have taken a conservative approach.

Table 6 – Standby generator costs

£ (000)	Per generator	Number	Total
Generator	68.5	150	10,275
Survey work	10	150	1,500
MCC / MDB modifications	75	65	7,312
Opex (annual)	1.7	30 (year 2) 60 (year 3) 90 (year 4) 120 (year 5)	1,946
Total			***19,600***

Enhancement need

We recognise that maintaining and replacing existing generators at WRCs and SPSs should be funded from base i.e. like-for-like replacement of assets that are reaching the end of their life or are not reliable. The purpose of this investment is to increase our fleet of generators to improve our resilience preparedness in the face of an increasing long-term threat of power outages related to climate change. This is driving a need for a step change in generator capacity and provision given our view of the associated risks set out above.

This additional resilience requirements in this area also reflects changes in the treatment of discharges. Prior to 2019, mains power outages were attributed to the DNO. In December 2019, the EA provided clarification that

discharges in the event of a mains power outage are in part the responsibility of the WaSC and therefore should be attributed to WaSC and not the DNO. The EA states that discharges taken at a time when unusual weather conditions are adversely affecting operations should not be taken into account in deciding whether or not the emission limit has been complied with. Unusual weather conditions are defined as those conditions "causing unforeseen loss of power supply to the sewage that could not be ameliorated by the reasonable provision and operation of standby generation facilities".

With severe weather events likely to become more common due to climate change, we consider that the provision and operation of standby generation facilities must increase to reflect this, i.e. reasonable provision must keep pace with the increasing frequency and likelihood of severe weather. This is a further reason why we consider this is a step change in requirements that does not fall under normal base activity.

4.2.3. Why this scheme has been prioritised

As set out above, our entire business plan has been developed with climate change resilience in mind, and this has underpinned our investment programme across all areas (often combined with other investment drivers). We are stepping up to this challenge in a range of areas, including (but not limited to) flood and power resilience. In our view, the full costs of all activities in our plan are required to strengthen our resilience to this growing threat.

We nonetheless identified schemes for this uplift based on Ofwat's guidance that schemes "should, as a minimum, address additional flood and power resilience requirements from climate change". Our standby generation and flood resilience schemes are directly related to addressing additional requirements in these areas. They have also been scoped and costed as part of our DWMP and business planning processes and have a clear basis.

We prioritise the power and standby generator resilience scheme as this is included as resilience enhancement in our plan. We also understand that Ofwat is considering setting a PCD in this area, having assessed all companies' proposals for climate change-related resilience activities. We consider this scheme would allow for this as we have identified the specific set of deliverables expected as part of these scheme.

Our Draft Determination response includes for the provision of standby generators at all required WRCs to mitigate the identified risk. If Ofwat does not allow our full request for resilience funding, and assuming Ofwat maintains its proposed approach in this area, we would maximise the use of the £11.6 million uplift allowance for the purchase of generators to be stationed at our most critical and highest risk WRCs. We estimate that this would allow us to install standby generator capacity at 60% of our remaining WRCs – equivalent to 85 sites. We note that, should Ofwat increase the size of this uplift commensurately with changes in companies' base cost allowances, we would expand the purchase of generators to as many remaining sites as needed (up to 150).

We welcome further engagement with Ofwat in this area about how best to continue mitigating climate change risk across the industry.

Annex 1 – DWI regulation 17(1)a notice

This annex has been fully redacted for public release.

Annex 2 – Wessex Water cyber maturity assessment

This annex has been fully redacted for public release.