Information requested by Taumata Arowai

02 April 2024

Purpose

Assurance of ongoing supply of a sufficient quantity of drinking water in the Wellington Region

- On 21 February 2024 Taumata Arowai's Chief Executive requested the Chief Executives of Wellington Water and its Wellington Metropolitan council owners to provide Taumata Arowai with a plan to mitigate the risk of insufficient water for the region over the 2024/25 summer.
- On 15 March 2024, Taumata Arowai the Chief Executives responded with a letter setting out the most effective way to combat water shortages and ensure a smooth water supply, the region needs to increase the amount of water input into the system, reduce authorised consumption of water, and minimise real losses.
- Taumata Arowai has responded asking for some operational more information – which is set out in this document.

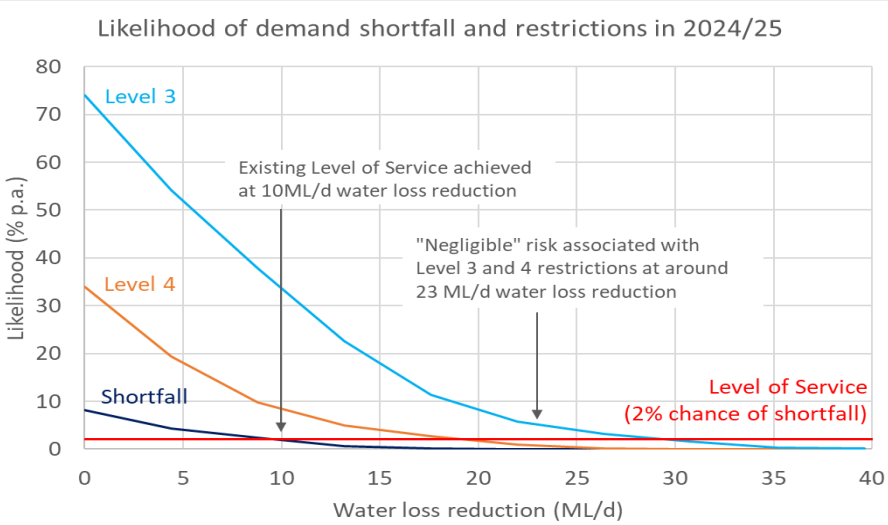
Wellington Water

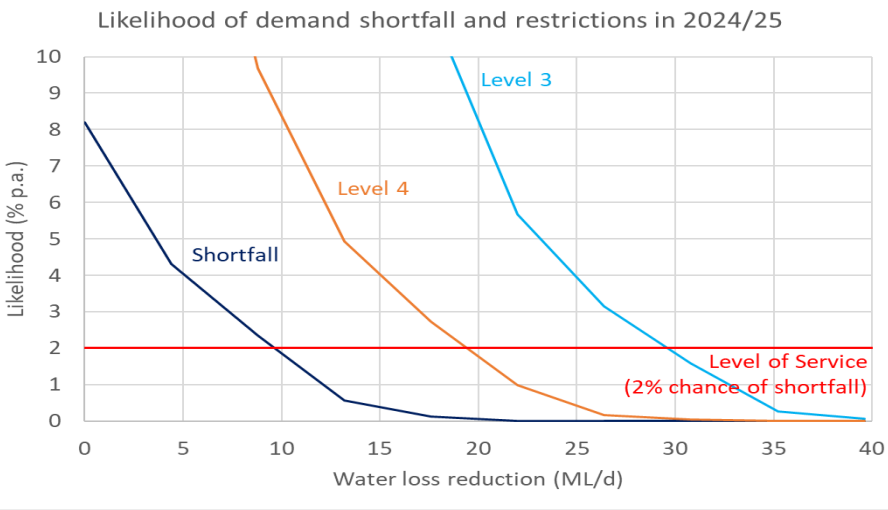
Water loss and Reduction Targets

1. Total estimated volume of water loss through leaks.

Council	Public Water loss %	Water loss % including Private Leaks	Use in MLD for 24 Hrs at 8am 23 March	Water Loss in MLD Public Network for 24 Hrs at 8am 23 March
Overall	**36%**	**45%**	**182**	**65.5**
WCC	35%	44%	88	30.8
PCC	34%	44%	21	7.1
HCC	38%	47%	51	19.4
UHCC	42%	50%	22	9.2

2. Total regional water loss targets





Council	Proportion of bulk water supplied in 2022/23	Targets to reduce the risk associated with Level 3 or 4 restrictions to a "negligible" level before 31 Dec 2024 (ML/d)	Targets to reduce the risk associated with Shortfall to a "negligible" level before 31 Dec 2024 (ML/d)
WCC	49%	11.3	6.0
PCC	12%	2.8	1.4
HCC	27%	6.2	3.2
UHCC	12%	2.8	1.4
Total	**100%**	**23**	**12**

A "negligible" risk associated with Level 3 or 4 restrictions is where the likelihood of occurrence is around 5% for Level 3 and around 1% for Level 4. This is a judgement based on our understanding of the Wellington context, community and economic impacts at different levels of restriction, and awareness of national and international good practice. Water loss would need to be reduced by approximately 23ML/d to achieve these likelihoods of occurrence.

3. Operational Spending each Council has allocated to reduce water loss through to the end of 30 June 2024 and 31 December 2024

Current Status

Council	Open leaks open @ 28/03/2024	High and Low estimate of leakage in MLD	
		H	L
HCC	712	4.3	2.8
PCC	180	1.1	0.7
UHCC	230	1.4	0.9
WCC	1686	10.1	6.7
Total	**2808**	**16.8**	**11.2**

Base Funding 2024/25

Council	Base Funding FY2024/25	Projected Open leaks under Base Funding @28 Feb 2025	High and Low estimate of leakage @ 28 Feb 2025 under base funding in MLD		Saving Potential @28 Feb 2025 ML/D with Base Funding	
			H	L	H	L
HCC	$6,011,134	668	4	2.7	0.3	0.1
PCC	$2,655,184	197	1.2	0.8	-0.1	-0.1
UHCC	$1,326,690	463	2.8	1.9	-1.4	-1.0
WCC	$12,988,159	984	5.9	3.9	4.2	2.8
Total	**$22,981,167**	**2,312**	**13.9**	**9.3**	**2.9**	**1.9**

Estimated Additional Funding to achieve ideal level of open leaks (Clear the Backlog)

Council	Estimate (range) of additional funding required to address the gap between the projected open leaks @28 Feb 2025 and the ideal level of open leaks		Ideal level of open leaks per council (equivalent to 10 days of incoming leaks).	Losses (MLD) at ideal level of open leaks		Saving Potential @28 Feb 2025 ML/D with additional funding	
	High Cost Scenario	Low Cost Scenario		H	L	H	L
HCC	$2,234,073	$1,632,328	108	0.6	0.4	3.4	2.2
PCC	$852,051	$607,289	36	0.2	0.1	1	0.6
UHCC	$1,349,850	$1,136,424	41	0.2	0.2	2.5	1.7
WCC	$4,660,188	$3,345,095	146	0.9	0.6	5	3.4
Total	**$9,096,162**	**$6,721,136**	**331**	**1.9**	**1.3**	**11.9**	**7.9**

*See final slide for assumptions incorporated

Water loss and Reduction Targets

3. Total MLD savings through leak repair*

	Proportion of bulk water supplied in 2022/23	Targets to reduce the risk associated with Level 3 or 4 restrictions to a "negligible" level before 31 Dec 2024 (ML/d)	Targets to reduce the risk associated with Shortfall to a "negligible" level before 31 Dec 2024 (ML/d)	High Flow Current Funding Repairing Leaks at 28 Feb (ML/d)	High Flow Additional Funding (Clear Backlog) at 28 Feb (ML/d)
HCC	27%	6.2	3.2	~~0.3~~	3.7
PCC	12%	2.8	1.4	~~-0.1~~	0.9
UHCC	12%	2.8	1.4	-1.4	1.2
WCC	49%	11.3	6.0	4.2	9.2
Total	**100%**	**23 MLD**	**12 MLD**	**2.9 MLD**	**14.9 MLD**

7.4 MLD

The funding level currently indicated by each Council achieves 7.4 ML/d (High Flow) giving the approx. chance of Emergency <3%, and the approx. chance of Level Four 12%**

*other water loss activities will to the MLD Saving
** to be confirmed by modelling

4. WWL activities for each Council to achieve MLD targets

Metropolitan Water loss Reduction Plan:

- Pressure Management
- Repairing open leaks
- Leak Detection
- Reactive renewal of service connections
- Proactive renewal of service connections
- Main renewals
- Private leak identification, communication and repair

Note: Plan attached to WWL email.

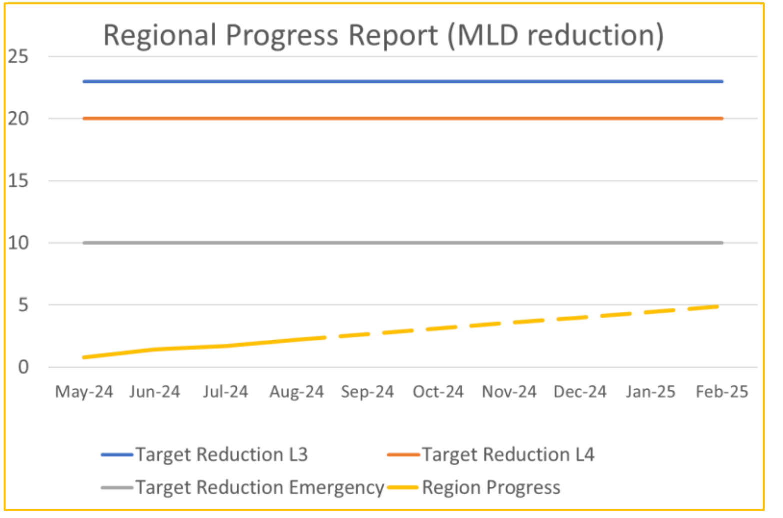
Reporting

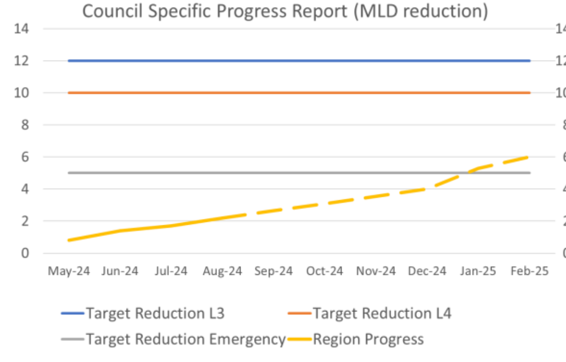
5. Methodology WWL uses to calculate water loss savings

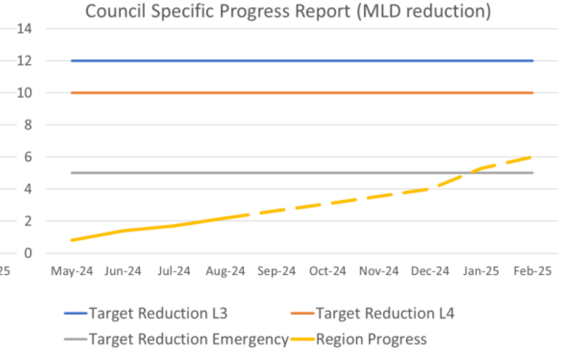
- Wellington Water will use the bulk water balance metering that corresponds to the portion of the water used by each council to measure the water loss savings for 2024.
- The meters allow real-time data to be captured daily but the monthly aggregate will give a good measure of the water loss savings by council.

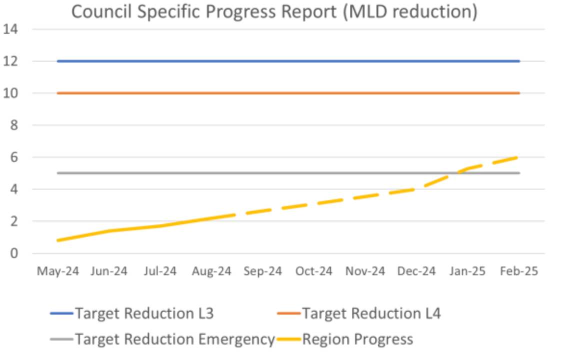
6. Indicative reporting dashboard on water loss reduction

Regional Progress summary









Regional Progress summary supported by individual council-specific reports against their sub-target

Reporting

6. Indicative reporting dashboard on water loss reduction (cont.)

Summer Risk Update

Current Level

1

Only use sprinklers every second day

Chance of Level 2 this summer

100%

We will move to level 2 this summer and will give approx. 7 days notice

Chance of Level 3 this summer

70%*

Our latest modelling shows this is most likely to occur in late Jan*

Chance of Level 4 this summer

33%*

Our latest modelling shows this is most likely to occur in early Feb*

Buffer Average past 7 days

25%

Buffer is greater than 20%**

We are at Level 1

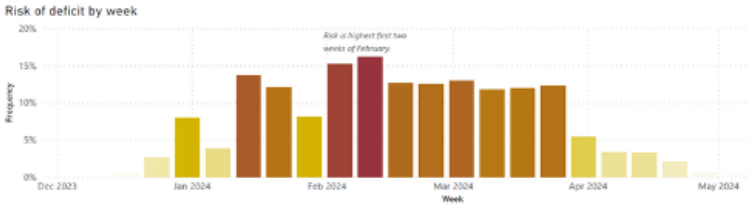
Buffer Forecast next 7 days

24%

Forecast buffer is greater than 20%**

We can stay at Level 1

When is risk the highest?



Updating of the model is reflected in a summary dashboard providing the chance of each restriction level

Reduction Activities

7. Industry Capacity assessment if additional funding approved

Not completed by 28 March and will be provided ASAP.

Modelling

8. Supply and Demand Modelling

	Anticipated start date	Likely time to complete modelling, review and internal adoption
Review benefit of residential restrictions over 2023/24 summer and consider if modelling assumptions should be updated	1 April 2024	01 May (post-summer analysis) 21 May (external review) 07 June (modelling update)
Update demands for 2024/25 summer based on latest year-end and winter demand assessment, and incorporate any changes to expected supply capacity	1 October 2024	31 October 2024
Karaka model update to incorporate the latest NIWA seasonal climate outlook and any changes to supply capacity	Monthly from 1 October 2024	31 October 2024

The above timings are based on current processes and do not include implementing any changes recommended in the planned external review of the SYM process (April 2024) and the Drought Management Plan (June 2024).

10. Key milestones and risks for Te Marua DAF Project

Key Scope and Milestones	MLD Volume	Target Date	Risks/Opportunities
DAF Tank Concrete Structures		August 2024	No float for weather delays, water network supply issues, or 3rd party impacts (i.e. Regional Park activities, supply of materials).
DAF Train 1 Mechanical & Electrical, and 2 of 6 filters renewed		October 2024	Complex commissioning in multiple areas of plant. Tying into existing plant while supplying water to the network carries higher risks to project delivery and delays so we do not impact regions' water supply. Early commissioning planning, and lessons learned from previous packages help to decrease the residual risks
DAF Train 1 Commissioned	20MLD	November 2024	Tying to older existing control systems and integration delays. Approval of discharge consent for commissioning water.
DAF Train 2/3 Commissioned	40MLD	May 2025	Opportunity and risk around next summer water supply, works could come earlier or later depending on how dry summer is.
Delivery of 6/6 Filters		End of 2025	Very dry next summer, delays re-start of renewals

Supply Activities

11. Resource consent variation

Variation to Existing Consents - Prohibited

Existing resource consents already authorise WWL to take as much water from the Hutt, Wainuiomata and Orongorongo rivers and from George Creek as the planning framework under Greater Wellington's Natural Resources Plan (NRP) allows, with one exception (taking some additional water from the Hutt River as emergency works down to a minimum flow of 400 L/s). Taking any additional water from other waterbodies including Wainuiomata and Orongorongo and below 400 L/s for the Hutt River would be a **prohibited activity**. A resource consent application cannot be made for a prohibited activity.

Emergency Works Consent

The only rule that an application could be made under for an additional water is operative NPR Rule WH.R2(d)(ii) and PC1 Rule WH.R34(d)(ii). These rules provide for the lowering of minimum flows in the Hutt River (Kaitoke) to 400 L/s for 'emergency works' as a discretionary activity. The NRP does not define 'emergency works' but we consider that the definition under section 330 would be applied and that taking additional water at Kaitoke down to a minimum flow of 400 L/s would be considered 'emergency works'.

Proposed intervention	Activity status	
	Operative NPR	NRP Plan Change 1
Lowering of minimum flows in Orongorongo River to below 100 L/s	Prohibited Rule WH.R4	Prohibited Rule WH.R36
Lowering of minimum flows in Wainuiomata River to below 100 L/s	Prohibited Rule WH.R4	Prohibited Rule WH.R36
Lowering of minimum flows in George Creek to below 100 L/s	Prohibited Rule WH.R4	Prohibited Rule WH.R36
Lowering of minimum flows in Hutt River (Kaitoke) to 400 L/s as 'emergency works'	Discretionary Rule WH.R2(d)(ii)	Discretionary Rule WH.R34(d)(ii)
Lowering of minimum flows in Hutt River (Kaitoke) to 200 L/s	Prohibited Rule WH.R4	Prohibited Rule WH.R36

Ecological Studies

Ecological studies into the impacts are continuing including fish surveys and water quality sampling in all surface water catchments.

Taumata Arowai experts are in contact with WWL experts.

12. Schedule for reporting on activities

Month	Scope
April	- Reduction Activities
May	- Reduction Activities
June	- Reduction Activities
July	- Funding allocation from Councils (LTP) - Reduction Activities
August	- Reduction Activities - Supply Activities
September	- Reduction Activities
October	- Reduction Activities - Supply Activities - Modelling
November	- Reduction Activities - Supply Activities - Modelling
December	- Reduction Activities - Modelling
January	- Reduction Activities - Modelling
February	- Reduction Activities - Supply Activities - Modelling
March	- Reduction Activities - Supply Activities - Modelling

Wellington Water

Operational Spending Assumptions

Leak Orders

- The current backlog of leaks reported as of the end of February 2024 is based off a Maximo data extract as of 26th March 2024. Figures may slightly change as leak orders continue to be processed and duplicates removed.
- It has been assumed that 40% of unconfirmed leak orders are duplicates and will be removed from the backlog.
- Increase in the rate of reported/detected leaks by 7.5% calculated using linear trendline on historical data from FY22/23/24. Data from FY21 has been excluded as stimulus funding provided for that year skews the numbers.
- A neutral baseline of ~350 open leaks is a realistic steady-state level across all councils. This is the equivalent of 10 working days of leaks reported/detected based on historical data.

MLD Savings

- The average saving per leak has been estimated in the range of 0.006 MLD to 0.004 MLD per leak. The 0.006 estimate is based off the priority of leaks delivered historically, whilst the 0.004 estimate is based off the priority of leaks currently in the backlog. Both assume the corresponding average leakage rates per leak: P1 – 12Lpm, P2 – 8Lpm, P3 – 3Lpm, P4 – 1Lpm.
- The MLD savings estimated are to be interpreted in the context of variance between the modelled scenarios, as they only consider leak backlog numbers.
- It is assumed that 18% of leak orders are closed without an actual issue once crews go onto the field. This reduces the MLD savings estimates and is based off historical data.

Costs

- Base cost rates for leak expenditure are based on average for FY22/23 (the last complete financial year). These are applied for the remainder of FY23/24.
- Cost rate uplift of 8% across all councils for FY24/25.
- A further 30% cost rate uplift for additional funding to reflect increased costs using surge resources (external contractors). This uplift is applied to the additional funding for FY24/25, as well as for the additional $1m + $1m provided for WCC this FY.
- The High-Cost scenario allows for an additional 10% uplift in cost rates across base funding and additional funding.
- The seasonality of future leak repairs follows historical profiles observed over the last three financial years.
- Additional funding has been applied from 1 July 2024 and assumes that we can ramp up resources prior to LTP sign-off. If this is not the case, then the 2-month stand-up time means extra funding works can only commence from 1 September 2024.
- All costs modelled constitute expenditure in reactive maintenance of the water supply network. The majority of this is used for leak repairs, but there are other water jobs included in these figures.