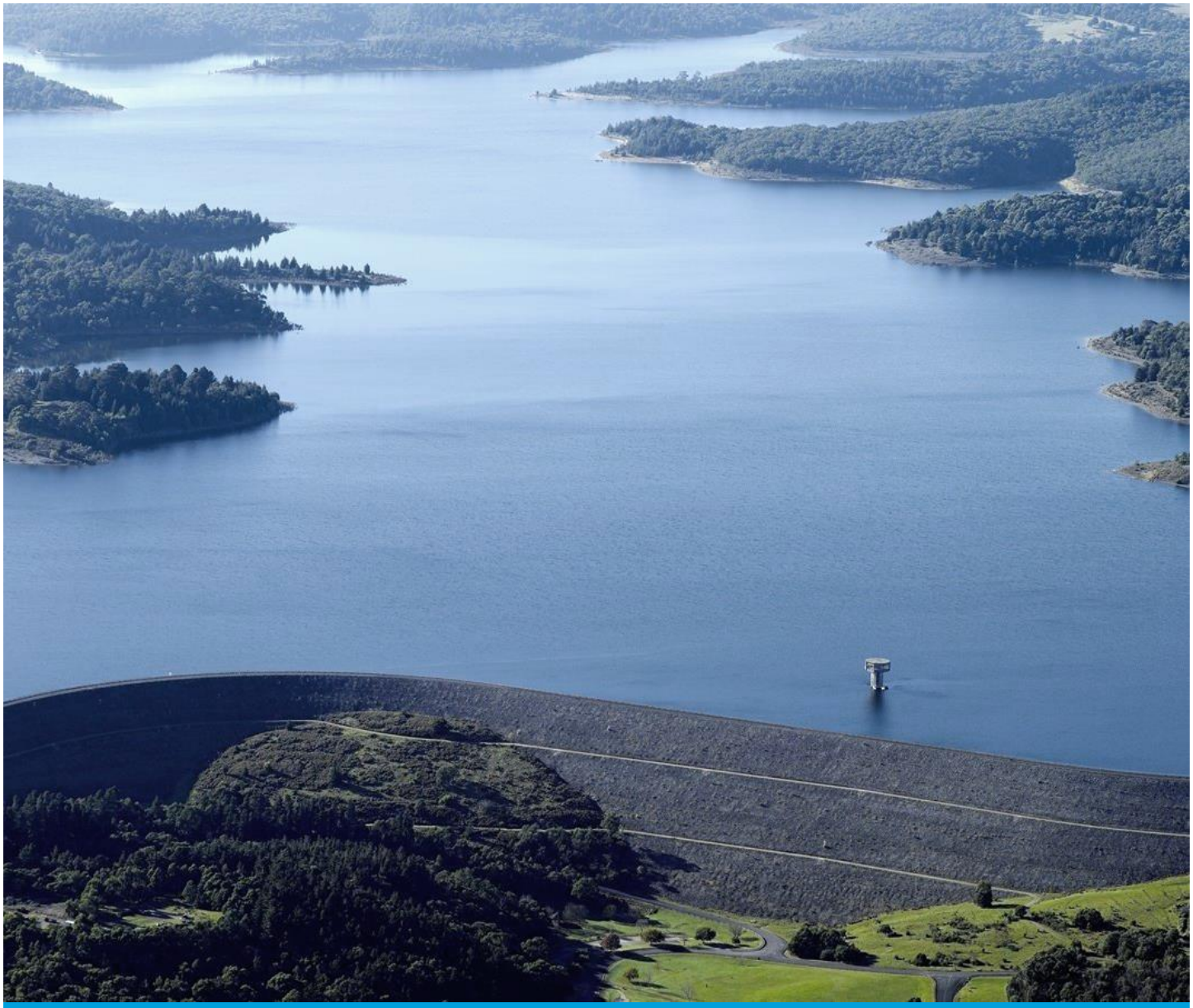

2018/19 Desalinated Water Order Advice

Summary of Technical Analysis

March 2018

VICTORIA State Government

Melbourne Water is owned by the Victorian Government. We manage Melbourne's water supply catchments, remove and treat most of Melbourne's sewage, and manage rivers and creeks and major drainage systems throughout the Port Phillip and Westernport region.

Melbourne Water
Enhancing Life and Liveability

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Purpose

1. This report summarises the technical analysis supporting the 2018/19 desalinated water order advice.

Context

Background

2. The Melbourne water supply system includes 10 major reservoirs and associated catchments that are used to harvest and store water, and the network of pipelines, pump stations, and tanks that are used to supply water to households and businesses across Melbourne and the surrounding region. The total system storage capacity of the 10 major reservoirs is 1,812 gigalitres[1] (GL), which is more than four times Melbourne's current annual demand for water.

3. The aim of water supply system planning and operations is to maintain a buffer of water in storage, subject to pricing impacts, to ensure supplies in future drought periods. These periods could last for more than a decade, as experienced in the 1997-2009 Millennium Drought. Thomson Reservoir, which provides around 60% of total system storage capacity, is Melbourne's drought reserve and was last full in November 1996, immediately prior to the Millennium Drought.

4. A number of projects to secure water supplies were initiated during the Millennium Drought, including the Victorian Desalination Project (VDP). The VDP was completed in 2012 and is connected by an 84 kilometre underground transfer pipeline to Cardinia Reservoir in the Melbourne water supply system. The VDP is operated by AquaSure, and can supply up to 150 GL/year, or around one third of current annual water demand. Bulk Entitlements to water from the VDP are owned by the retail water businesses (City West Water, South East Water, and Yarra Valley Water).

5. Since the VDP was completed in 2012, desalinated water has been ordered by the Victorian Government in 2016/17 and 2017/18. Figure 1 shows historical water storage levels since 2012, and indicates approximately how historical water storage levels could have tracked without the desalinated water that was delivered in 2016/17 and 2017/18.

[1] 1 gigalitre = 1 billion litres (the equivalent of around 400 Olympic swimming pools)

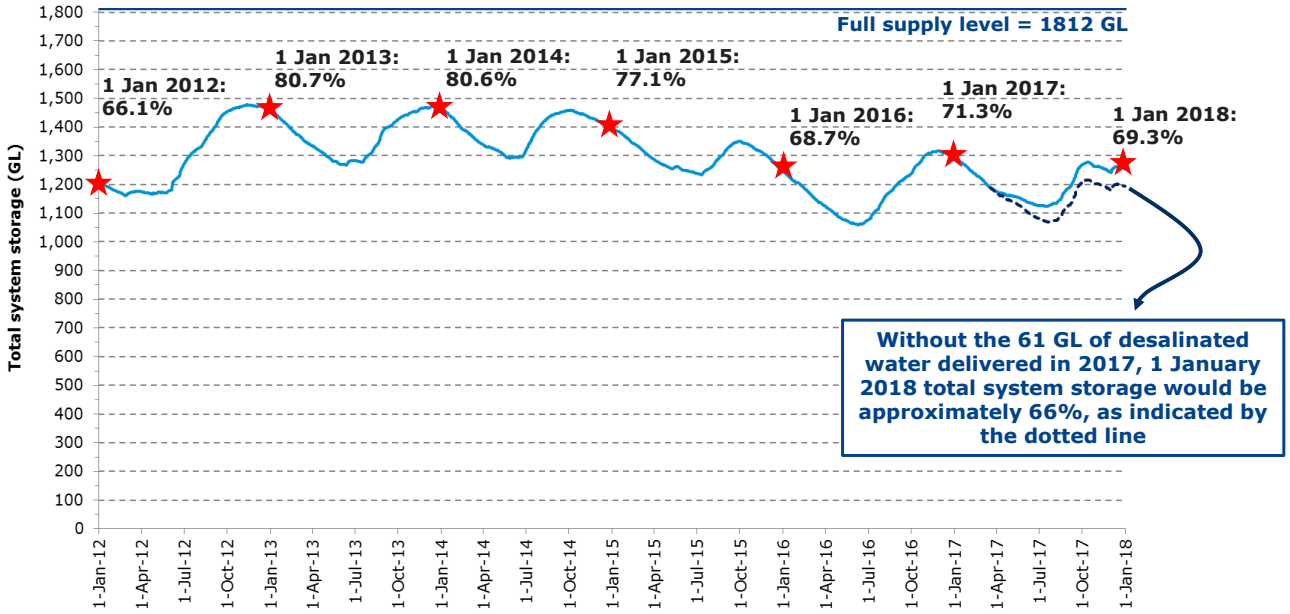

Figure 1: Historical water storage levels

6. Figure 1 shows that even with 61 GL of desalinated water delivered during 2017, Melbourne's water storages fell by 36 GL due to below average inflows to the rest of the water supply system, to 1,256 GL (69.3%) on 1 January 2018. Approximately 719 GL of this water was stored in Melbourne's drought reserve, Thomson Reservoir, making it approximately 67.3% full on 1 January 2018.

Melbourne Water System Strategy

7. In 2017, Melbourne Water published the *Melbourne Water System Strategy*, which presents a system view of water resource management across Melbourne and the surrounding region over the next 50 years. The *Melbourne Water System Strategy* includes long-term water supply outlooks for each of the four streamflow scenarios described in the Department of Environment, Land, Water, and Planning (DELWP) *Guidelines for Assessing the Impact of Climate Change on Water Supplies in Victoria*. These long-term water supply outlooks suggest that under climate change effects the reliable yield of the water supply system throughout an extended drought sequence will continue to decline over time, and is currently estimated to be around 525 to 575 GL/year, including the operation of the VDP at its full capacity. Without the VDP, the reliable yield of the water supply system falls below the projected 2018/19 demands for the retail and regional water businesses of around 442 GL (see paragraph 22). This highlights the increasingly important strategic role of the VDP in the Melbourne water supply system in managing the impacts of climate change and a growing population. Since the timing of future extended drought sequences is uncertain, it is important to ensure preparedness for such an event at all times by planning and operating the water supply system to maintain a buffer of water in storage, subject to pricing impacts.

Desalinated water order advice

8. The State of Victoria is required to place a desalinated water order with AquaSure by 1 April each year under the *Project Deed* between the two parties. Prior to this, the *Water Interface Agreement* between the Minister for Water, Melbourne Water, and the Secretary of DELWP requires Melbourne Water to provide the State of Victoria (represented by DELWP) with the following desalinated water order advice:

    a) Its opinion of the volume of desalinated water required for the next financial year (i.e. 2018/19)

    b) Its opinion of the constrained months[2] (if any) that it considers should be subject to a constrained month cap and the proposed volume of such caps

    c) A non-binding forecast of the quantity of desalinated water required for the subsequent two financial years (i.e. 2019/20 and 2020/21).

9. Melbourne Water worked with the Melbourne retail water businesses (City West Water, South East Water, and Yarra Valley Water) which hold the Bulk Entitlements to water from the VDP to coordinate the process of consultation and deliver the technical analysis required to support the development of the 2018/19 desalinated water order advice. Other water entitlement holders across the water grid were also consulted during the development of the 2018/19 desalinated water order advice, to ensure the advice reflected their forecast needs from the Melbourne system.

Water Outlook zones

10. The desalinated water order advice is a key annual planning activity supporting short- and long-term water security for Melbourne and the surrounding region. The annual preparation of the advice follows from the publication of the *Water Outlook* by Melbourne Water and the retail water businesses on 1 December each year, and is linked to this process through the use of the Water Outlook zones in the preparation of the advice.

11. The retail water businesses' *Drought Preparedness Plans* specify a three zone adaptive framework for monitoring water security based on the volume of water in Melbourne's storages on 30 November each year, as shown in Figure 2. As illustrated in Figure 1 the end of November is typically when Melbourne's water storages transition from rising during the cooler, wetter months, to falling during the warmer, drier months. Notable features of the framework are:

    - Each year, a Water Outlook is published by 1 December by Melbourne Water and the retail water businesses to document and communicate water security status and any actions needed in the short to medium term with reference to the three zone adaptive framework.

    - Proactive management of storages for possible future severe drought events when storage levels are in the High Zone including ensuring water is used efficiently and drought response measures are identified.

[2] Subject to conditions specified in the Project Deed, the State may specify the maximum total volume of desalinated water which can be delivered (i.e. a constrained month cap) during the months of August, September, October and November

- When storages are in the Medium Zone actions are taken to ensure supply is available under severe drought conditions extending for up to five years. Stages 1 and 2 of the retail water businesses' water restrictions by-laws may also be used in this zone, although water restrictions can have significant social and economic impacts, so other approaches (e.g. voluntary water efficiency programs) may be implemented if similar reductions in water use can be achieved.
- Ensuring water storages do not enter the Low Zone except in extreme circumstances. Stages 3 and 4 of the retail water businesses' water restriction by-laws are available to be used in such a severe event.
- Ordering water from the VDP is an option in all three zones however the amount taken is determined through detailed analysis that considers and balances the five principles and other factors (discussed below).

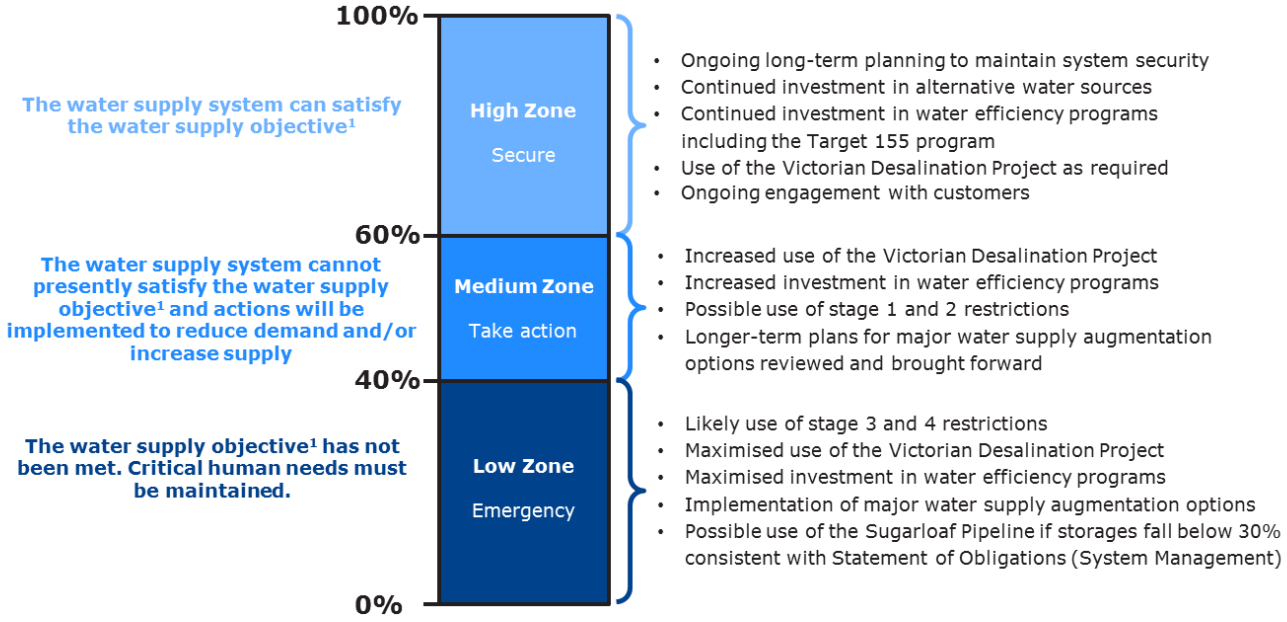

Figure 2: Melbourne's adaptive water security framework

12. In the Water Outlook for Melbourne published on 1 December 2017, storages were noted as being in the High Zone.

13. In the development of the desalinated water order advice, the Water Outlook zones are used to measure potential future water security by comparing projections of future water storage levels against the three zones.

14. The retail water businesses' *Drought Preparedness Plans* are periodically reviewed to ensure a similar level of water security is maintained with growing population and changing water use, and changing streamflow conditions under climate change. The retail water businesses' current *Drought Preparedness Plans* were implemented in 2017. More information on the 2017 review of the *Drought Preparedness Plans* can be found in the *Melbourne Water System Strategy* and the retail water businesses' *Urban Water Strategies*.

Principles

15. Consistent with the approach established by the water businesses and used in previous years, the 2018/19 desalinated water order advice is based around five principles. These were developed by the water businesses to balance the benefits of using the VDP in maintaining the short and long term security of supply to customers against the costs of placing an order and the potential for foregone water harvest[3]. The advice is based on the water businesses assessing an appropriate balance across these principles as it is not possible to completely satisfy all of them simultaneously throughout the three-year advice period. The advice is prepared recognising that while the first year order is binding, the opportunity to revisit the volume required in each of the second and third years, as part of the annual planning and ordering cycle, allows adaptation based on the storage levels and outlooks at the time.

16. Principles 1, 2 and 3 can be considered to be security principles which may be met by ordering desalinated water, while Principles 4 and 5 may be better met by minimising desalinated water orders in wetter years or when storage levels are higher. Principle 3 is considered in the context of the current total system storage, noting it has been in the High Zone since water restrictions were lifted in Melbourne in December 2012. Increased reservoir spills when storages are at capacity are considered a disbenefit to consumptive users under Principle 4 but they can provide potential environmental benefits for downstream waterways.

    - **Principle 1: Chance of storage volume falling below the Low Zone Action Point**
      Storages should remain above the Low Zone described in the retailers' Drought Response Plans on 30 November 2018, 30 November 2019 and 30 November 2020 under a severe drought sequence, which is defined as the driest sequence among the modelled streamflow sequences.

    - **Principle 2: Chance of storage volume falling below the Medium Zone Action Point**
      Storages should remain above the Medium Zone described in the retailers' Drought Response Plans on 30 November 2018, 30 November 2019 and 30 November 2020 under 90 per cent of modelled streamflow sequences.

    - **Principle 3: Storage Recovery**
      Storages should display a recovery trend such that the median (50th percentile) modelled total system storage levels across the modelled streamflow sequences increase in 2018/19, 2019/20 and 2020/21.

    - **Principle 4: Risk of desalinated water causing avoidable foregone harvest**
      Foregone harvest should be less than 12.5 GL/year for at least 50% of modelled streamflow sequences, and less than 25 GL/year for at least 90% of modelled streamflow sequences in 2018/19, 2019/20 and 2020/21. 'Foregone harvest' is defined as the modelled additional spills from the Melbourne water supply system and/or reduced harvest into Sugarloaf Reservoir for each modelled streamflow sequence due to the desalinated water order volumes supplied.

    - **Principle 5: Customer impacts**
      The impacts on the retailers' customers' bills should be minimised while providing an acceptable security of supply.

[3] 'Foregone harvest' is defined as the modelled additional spills from the Melbourne water supply system and/or reduced harvest into Sugarloaf Reservoir for each modelled streamflow sequence due to the desalinated water order volumes supplied.

17. Potential desalinated water order pathways were assessed against the five principles using detailed technical analysis described later in this report.

Technical analysis inputs and assumptions

Initial water storage levels

18. Water resource modelling for the 2018/19 advice projected future water storage levels from those observed on 1 January 2018 (1,256 GL or 69.3%). Approximately 165 GL of the water in storage on 1 January 2018 was allocated to entitlement holders other than the retail water businesses, including the regional water businesses, the Victorian Environmental Water Holder, and Southern Rural Water. Water resource modelling supporting the desalinated water order advice considers both inflows and demands associated with all entitlement holders in the Melbourne system. The distribution of water across the 10 major storage reservoirs in the Melbourne water supply system on 1 January 2018 is shown in Table 1.

Table 1: Distribution of water across the 10 major storage reservoirs in the Melbourne water supply system on 1 January 2018

Reservoir	Capacity at full supply (ML)	Volume (ML)	% Full
Thomson	1,068,000	719,205	67.3%
Upper Yarra	200,579	121,693	60.7%
O'Shannassy	3,123	3,054	97.8%
Maroondah	22,179	20,641	93.1%
Sugarloaf	96,253	87,803	91.2%
Yan Yean	30,266	26,710	88.3%
Greenvale	26,839	24,854	92.6%
Silvan	40,445	35,962	88.9%
Cardinia	286,911	179,505	62.6%
Tarago	37,580	36,815	98.0%
Total	**1,812,175**	**1,256,242**	**69.3%**

19. The observed water storage levels on 1 January 2018 were approximately 36 GL lower than water storage levels on 1 January 2017. During 2017, observed streamflows were approximately 17.2% below the average of the last 30 years.

Streamflow scenario

20. The technical analysis was based on modelling with the 'Post-1997 step climate change' streamflow scenario described in the 2016 *Guidelines for Assessing the Impact of Climate Change on Water Supplies in Victoria* prepared by DELWP. The use of the 'Post-1997 step climate change' streamflow scenario is representative of streamflows observed in recent history. The methodology used to establish this streamflow scenario results in consideration of some drought sequences more severe than those that have occurred historically. The 'Post-1997 step climate change' streamflow scenario was also used in the derivation of the Water Outlook zones, which are integrated into two of the principles outlined in paragraph 16.

21. The 'Post-1997 step climate change' streamflow scenario uses the observed streamflows for the period July 1997 to December 2017, with the observed streamflows from January 1913 to June 1997 adjusted to match the statistical properties of the period July 1997 to June 2017. This streamflow scenario is illustrated in Figure 3. In the water resource modelling, the 105 years of streamflow data are used to create 105 streamflow replicates (also referred to as streamflow sequences), that are used to assess the performance of potential desalinated water order pathways against a range of potential streamflow conditions. The difference between observed historical streamflows (grey bars) and the 'Post-1997 step climate change' streamflow scenario (orange bars) is illustrated in Figure 3.

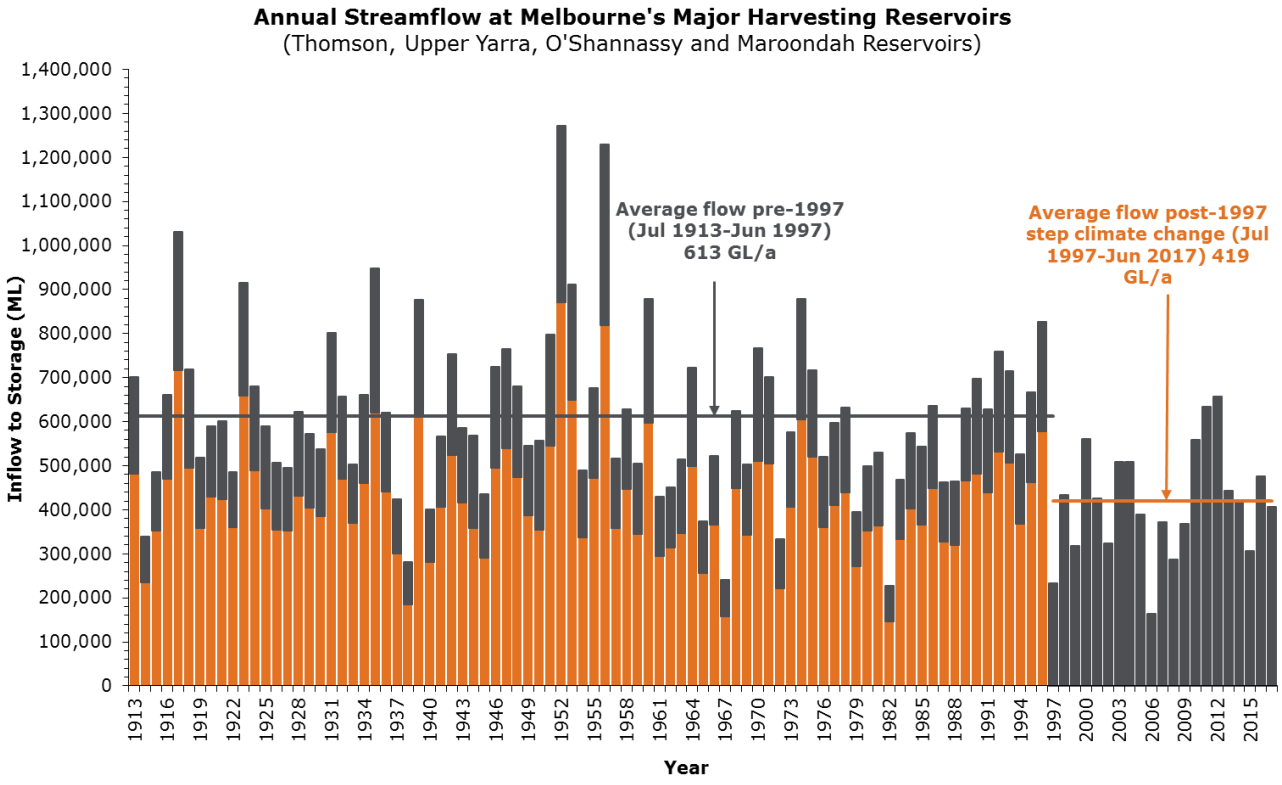

Figure 3: 'Post-1997 step climate change' streamflow scenario

Demand forecasts

22. To support the desalinated water order advice development process, the retail and regional water businesses provided demand forecasts for the next 15 years. Focusing on the first three years covered by the advice, the demand forecasts provided are outlined in Table 2. These demand forecasts assume the Target 155 program and Permanent Water Use Rules are in place. In the water resource modelling, these expected demand forecasts are adjusted up or down in each modelled year using a climate index to reflect the variability in demand typically observed in warmer and drier or cooler and wetter years. The demand forecasts for the retail water businesses outlined in Table 2 reflect the impact of significant recent growth in Melbourne's population.

Table 2: Demand forecasts provided by the retail and regional water businesses

Year	Retail water businesses (GL)	Regional water businesses (GL)	Total (GL)[1]
2018/19	427	15	442
2019/20	430	16	445
2020/21	432	16	448

[1]Total calculated based on sum of retail and regional water businesses before rounding them to the nearest 1 GL

23. The water demand forecasts in Table 2 do not include environmental water releases from water entitlements held by the Victorian Environmental Water Holder. For modelling purposes it was assumed that the Victorian Environmental Water Holder would use 2017/18 planned releases and annual allocation each year thereafter. The environmental allocations for key modelled river systems include:

    - Yarra River system: 17 GL/year
    - Thomson River system: 10 GL/year plus 3.9% of inflows to Thomson Reservoir (under the 'Post-1997 step climate change' streamflow scenario, 3.9% of inflows to Thomson Reservoir is approximately 6.8 GL/year on average).

24. The water demand forecasts in Table 2 also do not include rural irrigation water releases from water entitlements held by Southern Rural Water. For modelling purposes it is assumed that Southern Rural Water uses their annual allocation of 6% of inflows to Thomson Reservoir each year (under the 'Post-1997 step climate change' streamflow scenario, 6% of inflows to Thomson Reservoir is approximately 10.5 GL/year on average).

Operational considerations

25. The technical analysis supporting the 2018/19 desalinated water order advice also takes into account planned asset and operational constraints including:

    - **Upper Yarra Reservoir:** To enable embankment improvement works, modelling assumes the storage level will need to be temporarily maintained at around 70 GL (full supply level approximately 200 GL) between September 2019 and May 2020, with drawdown to this volume commencing from January 2019.
    - **Cardinia Reservoir:** Maximum operating limits are currently in place consistent with dam management guidelines until embankment improvement works are delivered. Modelling assumes the storage level will be maintained below 263 GL (full supply level approximately 287 GL) until July 2022.

- **Yan Yean Reservoir:** Modelling assumes Yan Yean Reservoir does not contribute to supply until November 2019 when water treatment plant upgrades are expected to be completed.
- **O'Shannassy Reservoir:** To enable an upgrade of the outlet structures, modelling assumes storage will not contribute to supply during February and March 2019.

26. Other key modelling assumptions related to water supply system operations are similar to those used in previous years, including:
    - Winneke and Tarago water treatment plant output up to 130 GL/year and 16 GL/year respectively, depending on water availability at these sites and others.
    - No use of the Sugarloaf (North-South) Pipeline, which is consistent with the requirements of the Statement of Obligations (System Management).

Cost information

27. To support water resource modelling and price modelling DELWP provided estimates of costs associated with each of the desalinated water order volume options based on the best available information.

Technical analysis results

28. Water resource simulation modelling was undertaken to support the 2018/19 desalinated water order advice, which provides an outlook from 1 January 2018 to 30 June 2021, covering the three financial years for which advice is required under the *Water Interface Agreement*. This modelling considers all possible desalinated water orders that could be placed under the *Project Deed* during this period (including 0 GL), and identifies the desalinated water orders most likely to lead to outcomes consistent with the principles described in paragraph 16.

29. The simulation modelling results for the base case assumptions are summarised in Table 3. These results reflect, for a given 2018/19 desalinated water order volume, the residual risks after taking into account the potential to increase or decrease desalinated water orders in 2019/20 and 2020/21 in response to observed conditions. This ability to incorporate the potential to adapt desalinated water orders in 2019/20 and 2020/21 in the simulation modelling is a recent enhancement made to modelling capabilities.

30. Table 3 also includes results derived from price modelling undertaken by the retail water businesses, to assess the indicative impact of each potential 2018/19 order volume on a typical residential customer bill in 2018/19 based on the use of 150 kL/year. The price modelling was focused on the additional costs associated with the various potential order volumes, and does not reflect the impact of the annual security payment.

2018/19 desalinated water order volume (GL)	Principle 1			Principle 2			Principle 4						Principle 3			Principle 5				
	Percentage of streamflow replicates that fall into the Low Zone (below 40% on 30 November)			Percentage of streamflow replicates that fall into the Medium Zone (below 60% on 30 November)			10th percentile foregone harvest (90% of streamflow replicates have foregone harvest less than this volume) (GL)			50th percentile (median) foregone harvest (50% of streamflow replicates have foregone harvest less than this volume) (GL)			50th percentile (median) storage recovery (50% of streamflow replicates have greater storage recovery than this volume) (GL)			Average discounted cost of producing desalinated water over the three year outlook period ($M)	Indicative impact of 2018/19 order on typical residential customer bill (150 kL) ($)	Average order volume across all streamflow replicates (GL)	Average change in order volume between years across all streamflow replicates (GL)
	Principle target: 0%			Principle target: Less than 10%			Principle target: Less than 25 GL			Principle target: Less than 12.5 GL			Principle target: More than 0 GL			Principle target: Minimise impacts (magnitude and variability) on customer bills in all three years				
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	All three years	Year 1	Year 2	Year 3	All three years
0 GL	0	0	0	10.5	17	11.4	0	3	12	0	0	4	-46	70	73	160	0	114	126	52
15 GL	0	0	0	9.5	16	11.4	2	8	12	0	0	4	-31	64	71	153	0	108	121	40
50 GL	0	0	0	9	12.4	9.5	7	17	12	0	1	4	0.2	42	63	152	8	95	107	44
75 GL	0	0	0	8.6	11	8.6	11	29	12	1	4	4	25	30	43	151	15	81	100	49
100 GL	0	0	0	7	9.5	8	15	41	12	2	7	2	50	12	27	158	27	66	85	60
125 GL	0	0	0	6.7	7	5.7	19	59	12	4	10	2	73	-2	25	164	38	53	71	74
150 GL	0	0	0	7	6	6	41	67	13	5	13	2	94	-24	16	174	49	42	58	88

Table 3: Summary of assessment against the five principles for all potential 2018/19 desalinated water order volumes

31. Table 3 suggests that:

    - There are no 2018/19 order volumes that enable outcomes throughout the three-year advice period that satisfy all of the principles. Consequently, the advice requires prioritising and balancing outcomes across the five principles. Each potential 2018/19 order volume has different benefits depending on the principle.
    - **Principle 1 - Avoid going into the Low Zone:** Any order volume (0 to 150 GL) in 2018/19 could avoid storages falling into the Low Zone on 30 November across the three-year advice period through adaptation of orders in 2019/20 and 2020/21.
    - **Principle 2 – Minimise risk of going into Medium Zone:** At least a 100 GL order is required in 2018/19 to ensure the risk of storages falling into the Medium Zone on 30 November can remain below 10% in all three years of the advice period. Orders of 50 GL and 75 GL slightly exceed this benchmark in 2019/20.
    - **Principle 3 – Maximise storage recovery:** 50 GL is required in 2018/19 to enable at least a 50% chance of storages recovering in all three years covered by the order advice.
    - **Principle 4 – Minimise foregone harvest:** A 50 GL order or less is required to maintain foregone harvest within the benchmark of less than 25 GL in 2019/20 for at least 90% of modelled streamflow sequences. This is influenced by the planned embankment improvement works at Upper Yarra Reservoir.
    - **Principle 5 – Minimise customers' bill impacts:** Lower order volumes in 2018/19 have a lower impact on customer bills in 2018/19 than higher order volumes. However, based on the outcomes of water resource modelling, average cost impacts over the three-year advice period appear to be similar for orders between 15 GL and 100 GL in 2018/19, since it is likely that lower orders in 2018/19 would need to be compensated with higher orders in 2019/20 and 2020/21.

32. The *Water Interface Agreement* requires non-binding forecasts of the quantity of desalinated water required for 2019/20 and 2020/21. There is significant uncertainty/variability associated with potential order volumes in these years, driven by the uncertainty surrounding potential future streamflows. For the purposes of developing the non-binding advice for 2019/20 and 2020/21, the averages of the modelled order volumes in 2019/20 and 2020/21 have been used. These were regarded to be an indicator of the order volumes likely to lead to outcomes consistent with the principles, and were rounded to the nearest increment available under the VDP *Project Deed*.

33. Figure 4 illustrates projected water storage levels over the next three financial years for the 105 replicates of streamflow associated with the 'Post-1997 step climate change' streamflow scenario. Figure 4 assumes, for example, 15 GL is ordered in 2018/19, followed by orders in 2019/20 and 2020/21 adapted for each streamflow replicate as needed to deliver outcomes consistent with the principles. The projected water storage levels if streamflows similar to those observed in 2006, 2007, 2008 and 2009 (an extreme drought sequence) were to be repeated are highlighted in yellow. For this particular streamflow sequence, the modelling suggests that it could be appropriate to order 150 GL in both 2019/20 and 2020/21, although water storage levels would still fall into the Medium Zone for at least the next three years.

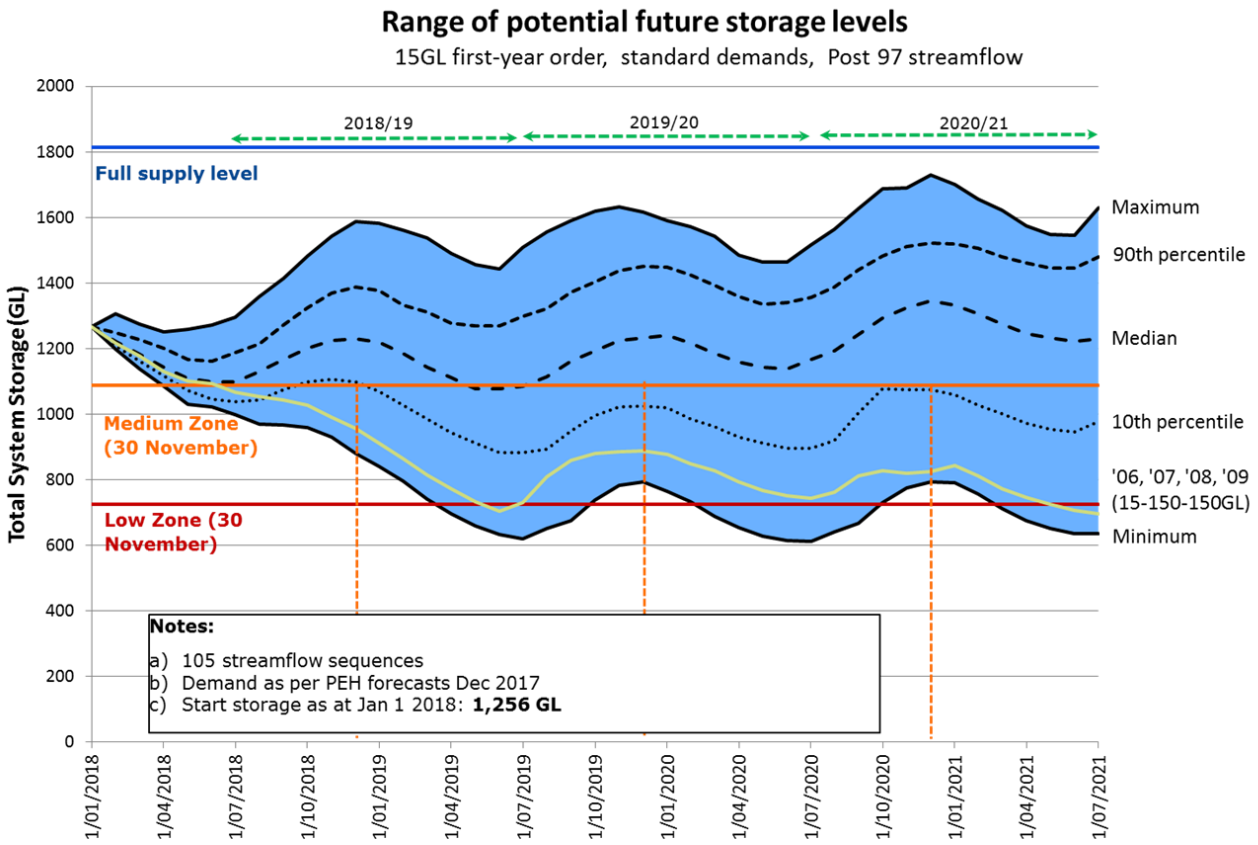

Figure 4: Modelled projection of potential future water storage levels assuming a 15 GL order in 2018/19

34. Other scenarios were also modelled to test the sensitivity of the model results, including a scenario with higher demands, and a scenario with higher streamflows. The results from these sensitivity scenarios suggest that:

    - Higher demand scenarios tend to need higher volumes of desalinated water to be ordered in 2018/19 to deliver outcomes consistent with the principles.
    - Higher streamflow scenarios tend to need lower volumes of desalinated water to be ordered in 2018/19 to deliver outcomes consistent with the principles.

Other considerations

Climate outlooks

35. The most applicable hydro-meteorological forecasts to inform the desalinated water order advice are the Bureau of Meteorology's seasonal streamflow forecasts and ENSO Wrap-up.

    - The ENSO Wrap-up (issued 27 February 2018) indicates that:
        - 'La Niña continues its decline, with sea surface temperatures in the central tropical Pacific Ocean warming over the past fortnight. Most models indicate a return to neutral conditions is likely early in the southern autumn.'
        - 'This ENSO event has had relatively little effect on Australian rainfall patterns over the 2017/18 summer.'
    - The seasonal streamflow forecasts for Melbourne's four major harvesting storages (issued 12 February 2018 and illustrated in Figure 5) generally favour near median flow or low flow for the period February to April 2018.

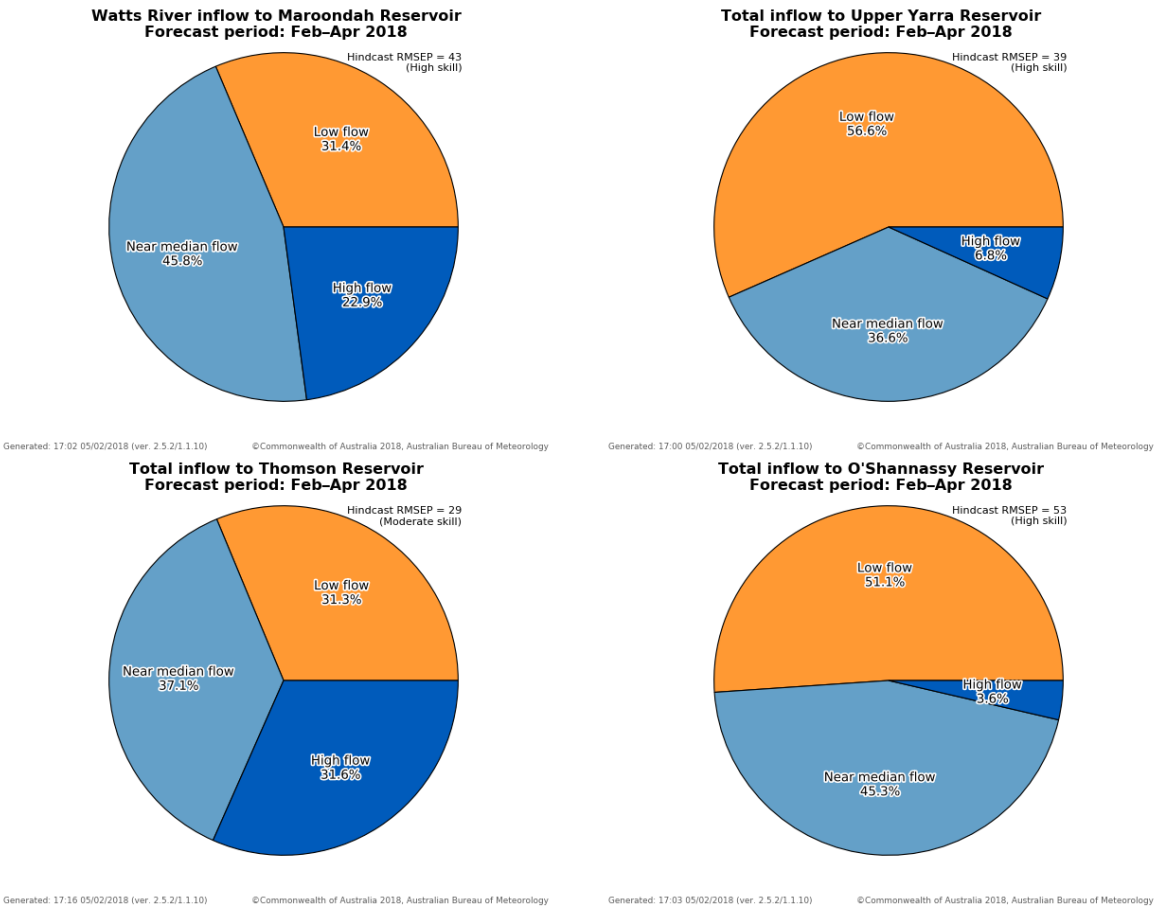

Figure 5: Seasonal streamflow forecast for Melbourne's four major harvesting storages for February to April 2018 (Source: Australian Government Bureau of Meteorology)

36. More generally, the Bureau of Meteorology climate outlooks issued on 28 February 2018 indicate for the period March to May 2018 approximately:
    - 40-45% chance of exceeding median rainfall
    - 65-70% chance of exceeding median maximum temperature

37. In general, none of these outlooks are strong drivers of the 2018/19 desalinated water order advice since they only extend into the short term future and not over the full three-year period covered by the desalinated water order advice.

Operational considerations

38. An order volume of 50 GL or less in 2018/19 would be operationally easier than higher order volumes to integrate into the water supply system, particularly given plans to start drawing Upper Yarra Reservoir down from early 2019 to around 35% of capacity for embankment improvement works from at least September 2019 to May 2020.

39. For an order volume of 50 GL or less in 2018/19, no constrained month caps would need to be specified in 2018/19.

Conclusion

40. Consistent with the requirements of the *Water Interface Agreement* described in paragraph 8, the following desalinated water order advice has been provided by Melbourne Water to the Victorian Government:

    a. Melbourne Water's opinion of the volume of desalinated water required for 2018/19 is 15 GL.

    b. Melbourne Water's opinion is that for a 15 GL order volume in 2018/19, no constrained month caps would need to be specified in 2018/19.

    c. A non-binding forecast of the quantity of desalinated water required for 2019/20 and 2020/21 is 100 GL in 2019/20 and 125 GL in 2020/21. These volumes are based on the average modelled desalinated water order volume required for the 'Post-1997 step climate change' streamflow scenario, rounded to the nearest potential desalinated water order volume increment that can be ordered under the VDP Project Deed and inclusive of the 15 GL minimum order volume.

41. While other options with higher order volumes in 2018/19 offer slightly increased water security, the desalinated water order advice outlined above:

    - Has the lowest possible cost in 2018/19
    - Could have the lowest cost overall if wetter conditions occur in 2018/19, 2019/20 and 2020/21
    - Provides the best cost of living outcome in the first and most certain year of the three-year period covered by the desalinated water order advice.