

# Maribyrnong River Flood Review

## Melbourne Water's response to Independent Review Panel's recommendations

**6 October 2023**

Melbourne Water thanks the independent Review Panel for its work to review the causes of the Maribyrnong River flood which occurred on 14 October 2022.

A copy of the report of the independent Review Panel can be found here [yoursay.melbournewater.com.au/maribyrnong-river-flood-review](https://yoursay.melbournewater.com.au/maribyrnong-river-flood-review)

Melbourne Water agrees in principle with all 15 of the Panel's recommendations. Melbourne Water's response to each of the Panel's recommendations is set out below.

| # | Panel recommendation  | Melbourne Water response  |
|---|---|---|
| 1 | Melbourne Water should review flood models every five years and update them every 10 years and after the occurrence of a major flood. | <p><b>Agree, work well underway</b></p> <p>Melbourne Water has committed to updating all flood modelling across the Port Phillip and Westernport catchments by 2026 which has required an uplift in funding to \$14 million over the current five-year price period 2021-26, up from a previous investment of \$3 – 4 million in the previous price period.</p> |

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|   |   | Melbourne Water will also adopt the Panel recommendation to update our flood models every 10 years.  |
| 2 | Melbourne Water needs to ensure that rainfall runoff and flood models are calibrated to observed flood information.   | <p><b>Agree, this is Melbourne Water current practice</b></p> <p>It is already a requirement of Melbourne Water’s technical specifications for flood modelling to calibrate models to observed flood information, in line with Australian Rainfall and Runoff Guidelines 2019 (ARR 2019). Therefore all future modelling will incorporate the requirement for calibration.</p>   |
| 3 | Melbourne Water should ensure that their rating curves, which represent the relationships between river levels and corresponding river flows, extend also to rare and extreme flood events and have been derived using established best practice. | <p><b>Agree, work underway</b></p> <p>Melbourne Water has updated the rating table for the Keilor gauge based on the 2022 flood event.</p> <p>As a pilot, Melbourne Water is also extrapolating the rating table for the Keilor gauge for extreme events. This requires field data collection, review and processing and will ensure Melbourne Water is more prepared for extreme events.</p> <p>The update to the Keilor gauge rating table is being used as a pilot for updates to all other rating tables. Once complete, the remainder of the program will be fully scoped and the timeframe for completing all updates will be confirmed.</p> |

4 Melbourne Water should take account of the best estimates of the impact of climate change when setting flood levels for planning and development and the application of the Land Subject to Inundation Overlay.

**Agree, this is Melbourne Water current practice**

Flood levels for planning and development and the application of the Land Subject to Inundation Overlay (LSIO) are based on Melbourne Water's technical specifications for flood modelling, which are in line with Australian Rainfall and Runoff Guidelines 2019 (ARR 2019).

ARR 2019 sets out best practice for flood modelling in Australia, including the incorporation of climate change assumptions. Melbourne Water has adopted the most conservative climate change assumptions for rainfall intensity recommended by ARR 2019.

Previously, the estimation of flood magnitudes has been based on historic observations. However, with climate change altering future conditions, and flood exceedance probabilities changing over time, there is now a requirement to consider adjusting flood design estimates to consider the impact of climate change.

AR&R notes that a number of factors considered in flood model development will be impacted by climate change, including rainfall intensity, duration, the conditions of the catchment the rain falls onto, and downstream conditions due to sea level changes.

The current guidance focuses on changes to rainfall intensity. It recommends increasing design rainfalls used in flood modelling by 5% for every degree of warming. It also provides a decision framework for deciding which climate change scenario (or

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|   |  | <p>Representative Concentration Pathway) to use for which models, depending on the purpose of the model. This includes considerations of asset life of the infrastructure being considered, and the consequence of failure of the asset.</p> <p>Melbourne Water has adopted an increased rainfall intensity that is consistent with the Representative Concentration Pathway of 8.5. This is the most conservative recommended by the AR&amp;R guidelines. This scenario leads to a 18.5% increase in rainfall intensity by 2100.</p> <p>The federal Department of Climate Change, Energy, Environment and Water is currently undertaking industry consultation to inform an update of the Climate Change Consideration chapter of the AR&amp;R 2019 guidelines. Melbourne Water will incorporate any new guidance arising from this review into its flood modelling program.</p> |
| 5 | <p>Melbourne Water should adopt forecasting tools which enable forecasts to be made within a total of no more than 60 minutes.</p> | <p><b>Agree in principle, subject to transition to the Bureau</b></p> <p>Melbourne Water supports the principle of faster forecasting and this is one of the reasons we are working to transition riverine flood modelling and forecasting functions to the Bureau of Meteorology (the Bureau), including for the Maribyrnong River catchment. This is in line with how the function is carried out in many other parts of the country.</p>   |

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| <p>6</p> | <p>Melbourne Water should use the hydraulic model developed (expected April 2024) to determine (and be subjected to independent peer review) the impact of the Flemington Flood Wall and the efficacy of the associated downstream compensatory works.</p> | <p><b>Agree</b></p> <p>Melbourne Water’s investigation to date has established some important facts; that the modelling assumptions on which decisions were based were accurate for this location and that the mitigating works designed to offset the Flemington Wall impacts were implemented as designed.</p> <p>Melbourne Water is now also finalising the complex year-long hydraulic modelling project that will provide a final confirmation on its overall impact. The Maribyrnong River flood model update will be completed in April 2024. Melbourne Water will then utilise the model to undertake the analysis to determine the impact of the Flemington Flood Wall and the efficacy of the associated downstream compensatory works.</p> <p>Melbourne Water has written to the independent Review Panel to propose that it reconvene to review the assessment, in accordance with the Terms of Reference.</p> |
| <p>7</p> | <p>Melbourne Water should commission an independent expert review and audit of their forecasting system with the aim of identifying areas where forecast accuracy, warning times and model run times could be improved.</p>                                | <p><b>Agree</b></p> <p>Melbourne Water will commit to seeking independent review as part of the transition of riverine flood modelling and forecasting to the Bureau (refer response to Recommendation 5). The review will be</p>  |

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|   |  | scheduled once the detailed transition plan has been agreed between the Bureau, VicSES and Melbourne Water.   |
| 8 | Melbourne Water should take account of the change in land use and projected changes to land use when setting flood levels for planning and development and the application of the Land Subject to Inundation Overlay.    | <p><b>Agree in principle</b></p> <p>New development in a catchment is included when flood models are updated. The flood model, accounting for change in land use is subsequently reflected in the application of the LSIO (and other relevant planning controls).</p> <p>When significant change in land use is proposed (e.g. greenfield areas, urban renewal precincts, big build projects) this can also trigger updates to the relevant flood model.</p>                              |
| 9 | Melbourne Water should immediately update the Mid Maribyrnong model with a modern two dimensional flood model developed in accordance with Melbourne Water guidelines and use this model to set new design flood levels. | <p><b>Agree, work well underway</b></p> <p>Melbourne Water has commenced updating the Maribyrnong River model which is expected to be ready in April 2024. The new model will be a 2D model in accordance with latest standards, including climate projections.</p> <p>In the meantime, an interim recalibrated model has been produced for the Mid Maribyrnong to provide guidance for planning and development and emergency management purposes, until the new model is available.</p> |

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| 10 | Melbourne Water should have a protocol that enables flood forecasting at intervals at less than two hours when prudent to do so by reason of responsiveness of the catchment for significant events.                           | <p><b>Agree in principle, subject to transition to the Bureau</b></p> <p>Refer to response to Recommendation 5.</p>  |
| 11 | Melbourne Water should consult with BoM to develop rainfall forecasts more frequently than 6 hours.  | <p><b>Agree in principle, subject to transition to the Bureau</b></p> <p>Melbourne Water will follow up this recommendation with the Bureau as part of our joint work to streamline flood forecasting and modelling.</p>   |
| 12 | Melbourne Water should seek the approval of the Minister for Planning to apply the interim planning controls designating the LSIO in locations where flooding occurred, pending the update to the Mid Maribyrnong flood model. | <p><b>Agree in principle</b></p> <p>Melbourne Water will determine suitable interim flood controls for the Mid Maribyrnong and will engage with the appropriate decision makers to seek their support.</p> <p>These interim measures would seek to control development in areas in the Mid-Maribyrnong which, as a consequence of the October 2022 flood, are now known to flood and would be updated with subsequent controls once the new model is complete in April 2024.</p> |
| 13 | Melbourne Water should investigate how it came to be satisfied with the reduction of the flood levels and finished   | <p><b>Agree, investigation is ongoing</b></p> <p>Melbourne Water commenced its investigations into Rivervue, which include the matter raised in this recommendation, shortly after the</p>   |

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|           | <p>floors levels at the Rivervue Retirement Village as specified in the endorsed plans dated 2 June 2009.</p>   | <p>flood event and continues these investigations. Melbourne Water is working to complete its investigations by the end of the year while acknowledging some aspects of the timing may be outside its control.</p> <p>There is a long history of development decisions related to the Rivervue site since the early 2000s. Multiple parties have been involved, including the developer, Melbourne Water and Moonee Valley City Council, VCAT and Planning Panels Victoria. This is a complex issue involving many parties and technical matters and it therefore requires careful investigation.</p> |
| <p>14</p> | <p>Melbourne Water should investigate the feasibility of installing one way valves on the outlets from the street and yard drainage from Evergreen Avenue (Rivervue Retirement Village)</p> | <p><b>Agree in principle, work underway</b></p> <p>Melbourne Water is committed to working with Rivervue to develop a site Flood Risk Management Plan (FRMP). The Panel’s recommendation for one way valves can be considered as part of this work, noting the drainage on the site is the responsibility of the site owners, not Melbourne Water.</p> <p>In addition, Melbourne Water is also seeking the support of VicSES and Moonee Valley City Council to ensure the Rivervue site is captured in the relevant municipal emergency plan.</p>   |

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| 15 | Melbourne Water should investigate long term sustainable flood mitigation options for the Maribyrnong River. | <p><b>Agree, work underway</b></p> <p>Melbourne Water has undertaken preliminary scoping work on long term mitigation infrastructure options for the Maribyrnong catchment.</p> <p>Further analysis of infrastructure and other options to manage and mitigate long term flood risk will be undertaken once the new flood model is available in April 2024.</p> <p>In addition to updated modelling, further work is required to understand implications including the potential environmental, community and cultural impacts of mitigation options. A detailed cost benefit analysis would also be required.</p> <p>Melbourne Water is committed to engaging with the community as these options are developed next year.</p> <p>In addition, Melbourne Water is working closely with our partner agencies to improve coordination and ramp up community awareness and preparedness.</p> |
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## More information

For more information about the review of the Maribyrnong River flood event please call us on 131 722 or visit

[Yoursay.melbournewater.com/maribyrnong-river-flood-review](https://yoursay.melbournewater.com/maribyrnong-river-flood-review)



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