



Legislative Council Environment and Planning Committee

Hearing Date: 10 May 2024

Question[s] taken on notice

Directed to: Melbourne Water

Received Date: 29 May 2024

1. David ETTERSHANK, page 6

Question Asked:

I guess I have sort of got one eye towards the publication of the report and such like, and I think the secretary did actually request a 1 per cent flood map with contour lines on it, which was provided. However, the contour lines do not tell us anything about the flooded areas – there are no contour lines there – so we are none the wiser as to whether there are 4 metres of water or 1 centimetre of water. Say, for example, on Kensington Banks, how do we understand the amount of water that will be affecting properties across that site, which up until now, as I understand it, has not even been literally on the map in terms of the flood zone. I am correct there, I think, aren't I?

Tim WOOD: As I mentioned, we have the information for each individual property, and we can provide that. If property owners ring us, we can provide them that individual information. Apologies about the contour maps; we probably just misread what you asked for. We can provide a map with the contours within the flood shape if you would like that. We can definitely provide that.

Response:

Work is ongoing on a response to this question and will be provided as soon as practicable.

2. David ETTERSHANK, page 6-7

Question Asked:

I will be guided by my colleagues here, but I think we would really like the report to be able to have graphically represented maps – graphics that show the properties that will be affected and the degree of impact across those. If we look at some of the maps that were provided today, I really struggle to actually figure out what was dry land normally as opposed to being buried under the blue. So can we actually look to get some graphics

that we can incorporate into our report that show the affected areas, the depth of the floodwaters in each of the 2020, 2024 and 2100 models and I guess relevant landmarks so people can actually work out what is what? Is that possible to do and provide in a timely manner to the committee?

Nerina DI LORENZO: We will take that request away, and we will provide a response to it.

Response:

Work is ongoing on a response to this question and will be provided as soon as practicable.

3. David ETTERS HANK, page 18

Question Asked:

Chair, thank you. I think I am just going to put some questions on notice, because we are not going to have enough time to get through them. There are just so many issues that we have not had an opportunity to address. The first question would be whether I could ask you to provide the 2100 model on a sort of timescale basis, because people obviously look at it and go, 'That's 75 years down the track.' Can you actually provide us with a graphic representation of what that might look like in 10 years, 20 years and 50 years time and suchlike, rather than simply at the end of 75 years?

Tim WOOD: I would have to take that on notice. I am not sure that that is available –

Nerina DI LORENZO: We will take that on notice.

Tim WOOD: but I will take that on notice to see whether that could be produced.

Response:

The 2024 and 2100 modelling outputs provide the information required to prepare communities for flood risks from both planning and emergency response perspectives. Melbourne Water will review these flood models in five years' time and update them in 10 years, this process will include updating climate change scenarios with evolving standards and information.

The request to provide 10y or 15y climate change scenarios for the Maribyrnong catchment (increments up to 2100) can be commissioned, although this would redirect limited modelling resources from development of flood information for other areas of the region. Additionally, the 'year by year' trajectory of the impact of climate change will be best assessed in a

regional context once all data is available as part of Melbourne Water's broader flood modelling uplift program.

4. David ETTERSHANK, page 18

Question Asked:

Okay. That would be great. In terms of the impact of flooding, there is a question of levels. There is also a question of water velocity. Can I ask you to just respond to the committee on whether or not, in your modelling of the impact of the flood wall, velocity was taken into account. If not, why not? And if it did, what that impact would be?

Tim WOOD: The modelling of velocity was taken into account for that, and I will have to take it on notice around if there was a specific impact. I am not aware of one that was highlighted.

David ETTERSHANK: There is nothing in the report about velocity.

Tim WOOD: Yes, I will double-check, but velocity was definitely taken into account.

David ETTERSHANK: Okay. So I guess the question would be: did it affect velocity, and what did that mean? In terms of the Rivervue Retirement Village, I think the report says that 47 villas at the retirement village are now subject to flooding at on a 2 per cent AEP. I would be interested to know what the impact is on the 1 per cent. I am happy to give all these as questions on notice, because the Chair has indicated we have run out of time, if that is all right.

Response:

In a 2024 1% AEP flood event the modelling has found the wall led to minor increases in velocity of (approximately) less than 0.13 m/s at the upstream end near Fisher Parade and decreases in velocity of (approximately) less than 0.20 m/s at the downstream end near Smithfield Road.

For context, the modelled velocities in the main channel were around 2m/s.

5. David ETTERSHANK, page 19

Question Asked:

But it is good to clarify. In terms of the response, you said, Dr Di Lorenzo, that you are continuing to work on all of the recommendations from the Pagone report. I am looking at recommendation 13, where you seem to have

basically washed your hands of the Rivervue decision. I think you actually said, 'There are things that we still don't know and we accept that we may never know given that these are historical events,' as though this is actually metaphysical or something. (a) I guess the question I would really like to see is: in terms of what is proposed, are you proposing to look further into how that terrible decision was made? And (b) if you could also provide us with some data on what you are proposing to do to address it. I see the report says you cannot do the one-way valves which were mentioned. But what are you going to do about this given the increasing number of villas that are affected to the point where I understand that most villas could not be sold within the last two years? People are just stuck with those villas now because of the ambiguity.

The CHAIR: We might just pause there.

Response:

5 (a)

Melbourne Water has been investigating the reduction of flood levels and finished floor levels at Rivervue to the extent possible based on the information available to it. Melbourne Water is only one of the many parties involved in the decisions relating to the site and only has access to its own information. There are things that we still do not know, and we accept that we may never know given that these are historical events.

5 (b)

In line with our previous commitments and the Independent Panel's recommendations, we will use our updated modelling to investigate mitigation measures across the catchment and their local and broader impacts. This will include an analysis of how we can improve the mitigations already in place. Melbourne Water is undertaking a whole-of-catchment approach to mitigation measures. Due to the nature and complexity of water flows, any potential mitigation measures will not be considered in respect of one area alone, but rather their broader potential impact on the catchment.

The models will be used to help inform these decisions about flood mitigation infrastructure and other options to manage flood risk.

While we cannot eliminate the risk of floods, we have key levers to minimise the impact of floods. The levers to mitigate flooding impacts includes tools such as physical maintenance, ensuring clear drains, installing retarding basins and new drains. Melbourne Water will consider options that deliver positive mitigation outcomes consistent with economic, environmental and social outcomes.

6. Samantha RATNAM, page 19

Question Asked:

One question, and if we cannot answer it in time, that is fine. It is connected to Mr Ettershank's question and refers back to a point you just made about that timeline and process for Rivervue being excluded from the LSIO. From the modelling that you have provided us, you have said to us, 'The LSIO behaved as we had predicted.' The one area of flood that was not in the LSIO was Rivervue, and now we know that the LSIO was removed from that area, so we are interested to know that process and how we do not repeat it in the future.

You mentioned before that the property owners had approached Melbourne Water, or the decision-making with the council, for its removal. My understanding of the process from the previous evidence we have received was that after Tigcorp bought the site, in 2011 they said, 'We've done all the mitigation works that Melbourne Water put as a condition of our planning permit,' so Melbourne Water then approved the planning permit, saying all the conditions had been satisfied. I am unclear whether the acquittal of all those works was required for Melbourne Water to remove the LSIO. At the time when we were provided the evidence, it did not look like, 'If you do the works, you get your planning permit approval, plus you get the LSIO removed.' It seemed like it was a two-step process. I want to clarify what Melbourne Water said to Tigcorp. Did it say, 'If you do the works, you get your planning permit'? It sounded like that at the time. And then in 2015 the C151 process began. At that time Tigcorp and the developers said to us when they came before us, 'We never approached Melbourne Water to start this process. We just said to them, "We've done all the works. Now take the LSIO off us," and they used C151 to get that removed.'

I am just interested to know who started what. I know the process started well before, but there is some involvement of these property owners asking for it to be removed. Did Melbourne Water say, 'If you do all the mitigation works, you get your planning permit and you get your LSIO removed when we can'? Do you have any record of that or any record of what the developer asked you all for?

Nerina DI LORENZO: We will take both of those questions on notice, and we will respond to both of those.

Samantha RATNAM: Great. That would be good.

Nerina DI LORENZO: Just to be very clear in terms of the work we have done with Rivervue, we are representing what we have gotten up to with this investigation, so we are being open about what we are up to. But I just want to be very clear: we are working very closely. We have a flood site management plan in place. We have been looking at site-specific issues, we have done some local work and now we move into using this information

on mitigation. I just want to make sure we are characterising that the right way. And we will absolutely provide a response out of here – take that on notice.

Response:

Subsequent to the developer completing earthworks as required conditions of the relevant planning permit, which were expected at the time to have removed the development from being subject to flood risk in a 1% AEP event, the developer made formal request of Moonee Valley Council to remove the LSIO pertaining to the site from the relevant planning scheme (C151), as part of a broader planning scheme amendment being progressed by council. The Council then referred this to Melbourne Water as the relevant referral authority for review, following which Melbourne Water notified council of a *No Objection*, based on the understood effect at the time of the earthworks removing flood risk.

Additional Questions:

1. David Ettershank

Question asked:

Please provide maps in a form that are understandable by the general public that show the actual properties effected and the depth of the flood waters in each of the 2022, 2024 and 2100 models for the affected areas in Kensington Banks, Edgewater, Riverview, Ascot Chase and Maribyrnong Townships (and any other currently occupied but to be affected areas).

The maps should also include identifiers such as roads, bridges and current non-flood waterfront edges.

Response:

Work is ongoing on a response to this question and will be provided as soon as practicable.

2. David Ettershank

Question asked:

Please provide maps that are understandable by the general public for populated areas subject to inundation in the 2100 model based on 15 year increments to 2100.

The maps should include extent/depth of inundation along with basic identifiers such as roads, bridges and non-flood waterfront edges. Ideally these are in a form that they are understandable by the general public.

Response:

The 2024 and 2100 modelling outputs provide the information required to prepare communities for flood risks from both planning and emergency response perspectives. Melbourne Water will review these flood models in five years' time and update them in 10 years, this process will include updating climate change scenarios with evolving standards and information.

The request to provide 15y climate change scenarios for the Maribyrnong catchment (increments up to 2100) can be commissioned, although this would redirect limited modelling resources from development of flood information for other areas of the region. Additionally the 'year by year' trajectory of the impact of climate change will be best assessed in a regional context once all data is available as part of Melbourne Water's broader flood modelling uplift program.

3. David Ettershank

Question asked:

What is the impact of the VRC floodwall in the context of the projected new 1% flood event?

Please provide similar scope of analysis to that used in both Melbourne Water's analysis of the 2022 flood as well as issues raised by the Review Panel (eg can Melbourne Water advise the depth of additional flooding caused by the Flemington floodwall from Maribyrnong Township to Footscray Road?).

Response:

Work is ongoing on a response to this question and will be provided as soon as practicable.

4. David Ettershank

Question asked:

What is the volume of water that would be held by the VRC precinct if the flood wall had not been constructed in the 2022 flood and the 2024 2% and 2024 1% modelling?

Response:

If the VRC wall had not been constructed the VRC precinct would have held a peak volume of 410,000m³ in the 2022 flood event, which is 0.6% of the total volume of the event. This volume would be 1,228,000m³ in a 2024 1% flood event if the wall had not been constructed, which would be the equivalent of 0.9% of the flood event.

5. David Ettershank

Question asked:

Please provide details about the proposed Maribyrnong Flood Mitigation study including proposed methodology and timeframes.

Response:

Now the new Maribyrnong River flood modelling has been completed, detailed assessment of long-term sustainable flood mitigation options are being further progressed (in accordance with the Pagone Panel's Recommendation number 15).

This work began last year with a preliminary desk top review of past flood mitigation studies for the Maribyrnong River (Maribyrnong Flood Mitigation Options, Evaluation of past options, 22 June 2023).

Now that the new modelling is complete, comprehensive identification and assessment of mitigation options is now being progressed (previously identified traditional solutions, as well as any new innovative solutions for the riverine flood hazards), using the new modelling to understand the impact of each option. In addition, comprehensive economic, environmental, social and cultural impact assessment will be undertaken.

Melbourne Water is seeking to engage specialist expertise and experience from the external market, including from offshore, to draw in contemporary and global best practice thinking and solutions.

The community and stakeholders will be invited to participate in the development and assessment of options later this year. We have shared the draft scope to be taken to the external specialist market with local councils for review and input. The draft scope is provided in Attachment A - Maribyrnong River Flood Mitigation Study Draft Scope.

The study will consider feasible flood mitigation solutions for the riverine flood hazards, that prioritise the safety and resilience of the communities within the catchment and have the greatest impact on reducing the flood

risk, both now and anticipated by the year 2100 and beyond. Consideration of applicability and scalability of options to the Melbourne-wide context will also be made.

We anticipate this work to be a 12-18 month duration, though this will be confirmed once detailed delivery methodology and plan is finalised with the external specialists who will assist with delivery.

6. David Ettershank

Question asked:

Will Melbourne Water be undertaking a detailed survey of Kensington Banks properties now subject to inundation, including floor levels above the new 1% peak? If so, when?

Response:

Individual property owners are encouraged to contact Melbourne Water to better understand the flood level of a 1% annual exceedance probability flood event on their property by calling 131 722 or emailing enquiry@melbournewater.com.au

If requested, Melbourne Water can provide local residents with information on flood level (Australian Height Datum) and flood depth.

The extent to which buildings are impacted by a flood event depends on the clearance between the ground and the floor of the building and any changes in elevation across the property. Individual property owners could engage a licensed surveyor to determine their floor level and whether any of the structures or other improvements on their property are below the flood levels advised by Melbourne Water.

7. David Ettershank

Question asked:

In March 2023 Melbourne Water released flood level survey data for the Oct-2022 flood¹. Of note was that only a solitary flood level from Oct-2022 was included for the Maribyrnong River downstream of Maribyrnong Township, being 1.19 m AHD somewhere in Kensington.

Can Melbourne Water confirm that such an extensive area can be accurately mapped and modelled using a single survey point?

¹ https://hdp-au-prod-app-mw-yoursay-files.s3.ap-southeast-2.amazonaws.com/4016/7841/2990/Maribyrnong-River_flood-level-survey-data_Oct22.pdf

Response:

There was a total of 110 flood marks used to calibrate the October 2022 flood model.

These marks were obtained from two separate surveys in 2022 and 2023. The 2022 flood mark surveys centred around Maribyrnong Township, Canning Street in Avondale Heights and some in Kensington. The 2023 flood mark surveys were carried out along the length of the mid and lower Maribyrnong River based on flood marks and debris lines and photos taken during the flood event.

This information in combination with the recorded water levels to metres Australian Height Datum at the Maribyrnong River at Chifley Drive Maribyrnong (230106A) gauge as well as photos, both terrestrial and aerial, created a comprehensive dataset to calibrate the flood model. Additionally, the flood model was validated to historic flood events.

8. David Ettershank**Question asked:**

Regarding Rivervue Retirement Village:

- (a) Can Melbourne Water advise what the new 2024 1% AEP flood levels are to m AHD upstream of Canning Street, Avondale Heights for 500 metres to the upstream extent of the Rivervue Retirement Village?
- (b) How many additional villas are flooded by the new 1% AEP flood level, and how many more villas are not afforded the 600 mm of freeboard flood protection above the new 1% AEP flood, they would ordinarily have?
- (c) Melbourne Water described mitigation works at Rivervue as “ongoing”. Could Melbourne Water please provide additional information on the nature of ongoing works at Rivervue?

Response:

8 (a) Work is ongoing on a response to this question and will be provided as soon as practicable.

8 (b) There were 48 properties impacted in the 2022 flood event. This is expected to increase to 104 properties (which includes the community centre and associated apartments) in the 1%AEP event for 2024. In the 1%AEP scenario, 64 properties of this 104 no longer have the 600 mm

freeboard (the height of the floor above expected flood level, effectively creating a buffer). Reducing this buffer results in above floor flooding only at such time as reduced to below zero.

8 (c) In line with our previous commitments and the Independent Panel's recommendations, we will use our updated modelling to investigate mitigation measures across the catchment and their local and broader impacts, including Rivervue. This will include an analysis of how we can improve the mitigations already in place. Melbourne Water is undertaking a whole-of-catchment approach to mitigation measures. Due to the nature and complexity of water flows, any potential mitigation measures will not be considered in respect of one area alone, but rather their broader potential impact on the catchment.

The models will be used to help inform these decisions about flood mitigation infrastructure and other options to manage flood risk.

While we cannot eliminate the risk of floods, we have key levers to minimise the impact of floods. The levers to mitigate flooding impacts include tools such as physical maintenance, ensuring clear drains, installing retarding basins and new drains. Melbourne Water will consider options that deliver positive mitigation outcomes consistent with economic, environmental and social outcomes.

9. David Ettershank and Samantha Ratnam

Question asked:

A number of constituents have raised questions about the correctness of the Maribyrnong Township historic flood marker for Sep-1993 and October 1983.

Would Melbourne Water please comment on the veracity of the questions from the constituents and whether they impact the credibility of the 2024 modelling and or affect flood preparedness/response. In particular:

- (a) Is Melbourne Water aware that the flood level you have marked on the Maribyrnong Township historic flood marker for Sep-1993 is about 0.5 m higher than the level marked on the flood marker pole prior to it being repainted in mid-2023? We have it on expert advice that the flood level for Sep-1993 should be 3.31 m to the current datum (m AHD) NOT the 3.83 m you have now.
- (b) Can Melbourne Water confirm the Jacobs report will be corrected and reissued with the correct Sep-1993 flood level of 3.31 m AHD?

- (c) Can Melbourne Water also undertake to have the incorrect Sep-1993 flood level on the Maribyrnong Township historic flood marker re-painted to the correct flood level, as soon as practicable?
- (d) Can Melbourne Water also advise all emergency management authorities, such as VICSES, Maribyrnong City Council, Moonee Valley Council and Melbourne City Council and any other affected parties that may have the incorrect flood level for Sep-1993, to correct their records and publications, either online or on their paper documents, reproduce said documents and re-distribute any flood awareness literature that may have been provided to the community since the error in the Sep-1993 flood level has been an issue?
- (e) In addition to the Jacobs 2024 Maribyrnong River Flood Modelling Project Summary Report containing the incorrect peak flood level for Sep-1993, it also contains the incorrect flood level for the Oct-1983 flood of ~3.6 m instead of 2.85 m. Melbourne Water's flood level for Oct-1983 on the Maribyrnong Township historic flood marker is correct at 2.85 m AHD, and we ask for the incorrect flood level for Oct-1983 to be corrected in the Jacobs report, at the same time as they are correcting the Sep-1993 flood level.

Response:

9 (a) While this is not an official flood measurement tool, Melbourne Water has been made aware that there is an error with the marking that we are in the process of rectifying.

9 (b) The Jacob's report is correct, it reports the flood level as recorded in the citation (SES 2018 flood guide). The report faithfully reported what was historically recorded, however different datums were used in different time periods. Melbourne Water will request Jacobs update their summary report to provide additional context and explain that the reported figure is to ACD (Admiralty Chart Datum) as was used in 1993. The figure of 3.31m is to AHD and has been used correctly in the model calibration in line with contemporary industry practice.

9 (c) While this is not an official flood measurement tool, Melbourne Water has been made aware that there is an error with the marking that we are in the process of rectifying.

9 (d) The Jacob's report is correct. Other agencies and councils communicate information in different forms, including in different datums that they deem most appropriate in their communications. Melbourne Water will use AHD as per contemporary industry practice and will re-

emphasise to partner agencies and councils what datum we are using where that might be helpful or applicable for them.

9 (e) The Jacob's report is correct. It correctly cites the report from which the figure is drawn (the Essendon Gazette) which is cited to ACD not AHD. The report will be marked to clarify this reporting. The modelling study has correctly used the figure as calculated in AHD. Melbourne Water will request Jacobs update their summary report to provide additional context and explain that the reported figure is to ACD as was used in 1993.

10. Gaelle Broad

Question asked:

Would Melbourne Water please comment on the veracity of the questions below and whether they impact the credibility of the 2024 modelling and or affect flood preparedness/response:

The peak flow for the Sep-1993 flood at Keilor quoted by Jacobs Post-Event Analysis report in Table 11 on page 41, and Table 17 on page 49 is 690 m³/sec. This is substantially more than the 560 m³/sec Melbourne Water had for the peak flow at Keilor in Sep-1993, according to the Table of major floods (from 1871), as of August 2001, see above.

Furthermore, the relationship between the peak flood heights at the Maribyrnong Township in 1983 and 2022, and the corresponding peak flows at Keilor, show that the peak flow at Keilor in Sep-1993 at 3.31 m AHD is consistent with a peak flow of 560 m³/sec.

As a consequence of the above, can Melbourne Water:

- (a) Investigate the significant difference in their previous historic flood peak flow at Keilor in Sep-1993, compared to what Jacobs is now reporting for Sep-1993, and provide an explanation.
- (b) Advise if the major change of around 20,000 ML/day in the upper range of the stage-discharge rating for the Maribyrnong River at Keilor, resulting from the high flow gaugings carried out on 14-Oct-2022, have been retrospectively used to recalculate the major flood flow back in Sep-1993. If not, why not?

Response:

Detailed analysis of available information relating to peak flows at the Keilor gauge has been undertaken as part of the Jacob's report which included incorporation of revised ratings tables (captured as part of the

2022 event). The revised rating table enabled the 1993 peak flow to be revised. It is standard practice during a flood study to review and update historic flow when a new rating table becomes available.

The previously recorded 1993 peak flow of 690/s has therefore now been updated to 510m³/s.

11. Gaelle Broad

Question asked:

In relation to Question 10:

- (a) If Melbourne Water confirms that the peak flow at Keilor in Sep-1993 was more like 560 m³/sec than 690 m³/sec, does Melbourne Water believe this will necessitate re-runs of Jacobs rainfall-runoff RORB model for the Maribyrnong catchment?
- (b) Again, if the peak flow at Keilor in Sep-1993 is shown to be 560 m³/sec, rather than 690 m³/sec, does Melbourne Water believe the flood frequency analysis for the Maribyrnong at Keilor carried out by Jacobs needs recalculating, and any consequences for the 1% AEP flood need to be assessed.

Response:

The re-rating of the Keilor gauge was accounted for in flood modelling and therefore does not require recalculating.

Detailed analysis of available information relating to peak flows at the Keilor gauge has been undertaken as part of the Jacob's report which included incorporation of revised ratings tables (captured as part of the 2022 event). The revised rating table enabled the 1993 peak flow to be revised. It is standard practice during a flood study to review and update historic flow when a new rating table becomes available.

The previously recorded 1993 peak flow of 690/s has therefore now been updated to 510m³/s.