# Department of Planning, Housing and Infrastructure



Our Ref: GR-2024-12 (IRF25/1055)

Stephen Barry Planning Director Level 15, 135 King Street Sydney, NSW 2000

Received by the IPC 23 May 2025

CC: Tahlia Hutchinson, Senior Planning Officer via email:

### 21 May 2025

Subject: Georges Cove Marina (PP-2024-658)- request for further information

Dear Mr Barry,

Thank you for your correspondence and request for a joint NSW State Agencies submission on the gateway determination review for the above planning proposal. The Department of Planning, Housing and Infrastructure (the Department) has reviewed the proponent's additional information submitted on 28 March 2025 including flood risk assessment and evacuation plan by Martens, planning letter by EMM and cover letter by Corrs, and coordinated a response with Department of Climate Change Energy Environment and Water (DCCEEW) and NSW State Emergency Service (SES) and provides the following responses to the Independent Planning Commission's queries:

# *Question No 1: Clarification whether the additional material provided by the applicant changes any of the Department's recommendations set out in the Department's Justification Assessment.*

Based on the additional material submitted by the proponent, the comments received from agencies and DPHI technical experts' advice, the Department retains its original position that the planning proposal should not proceed. The planning proposal remains-

- Inconsistent with Greater Sydney Region Plan a Metropolis of Three Cities and Western City District Plan by locating additional dwellings in hazardous areas with limited evacuation options.
- Inconsistent with Liverpool City Council's LSPS and Liverpool Housing Strategy by locating additional dwellings in an area where the demand is not high and is not considered to be well serviced.
- Unjustifiably inconsistent with Local Planning Directions 1.1 Implementation of Regional Plans and 4.1 Flooding by increasing density in a high flood hazard area which is also a flood way.

The proposal seeks to permit prohibited land uses on land that is heavily environmentally constrained, and the planning proposal does not demonstrate strategic and site-specific merit.

As such, the recommendations set out in the Department's Justification Assessment remain unchanged.

### Question No 2: Advice on the additional material from the NSW State Emergency Service (SES) and the Department of Climate Change, Energy, the Environment and Water (DCCEEW) Biodiversity, Conservation and Science Group (BCS).

The Department has received advice from NSW SES and DCCEEW- Conservation Preservation and Heritage Regulation (CPHR) previously known as BCS as follows.

### DCCEEW CPHR - Flood risk assessment response

The site is unsuitable for residential development even if the habitable floors are proposed to be located above the probable maximum flood (PMF) level. The additional modelling shows that the base case and post development flood characteristics (e.g. flood depth and hazards) are the same.

The flood risk assessment concluded that-

- The site is situated on a floodplain and is impacted by both frequent and rare floods. Flow rates and flow volumes from the Georges River conveying adjacent to the site would be very high under flooding events.
- The modelling shows that the site would have a flood depth of 6 8 m and higher under the PMF Event and be inundated for around 36 hours or longer.
- The site acts as a flood storage under frequent flood events and is a flood flow corridor i.e. floodway under the PMF Event with highest hazard level H6, meaning it is unsafe for vehicles and people and all building types are considered vulnerable to failure.
- In a 5% Annual Exceedance Probability (AEP) the area would be inundated for around 20 hours and the hazard level would be H5 meaning it is unsafe for vehicles and people.

In this regard, the proposal is considered to not satisfy the Section 9.1 Ministerial Direction 4.1 Flooding by

- permitting development in floodway areas
- permitting development for the purposes of residential accommodation in high hazard areas
- permitting a significant increase in the development and/or dwelling density in lands which are likely to result in a significantly increased requirement for government spending on emergency management services, flood mitigation and emergency response measures, which can include but are not limited to the provision of road infrastructure, flood mitigation infrastructure and utilities.

#### NSW SES - Evacuation and management response

The proposal is not supported by NSW SES due to the following:

• The revised evacuation modelling does not include vehicles evacuating from other proposals which are further progressed towards finalisation. The report has chosen to exclude 38,068 vehicles from modelling compared to the Molino Stewart Life Safety Model (2022) and also assumes lower numbers for other sites stating 'vehicle populations were calculated by

assuming approved car parks were at 50% capacity' e.g. 176 instead of 585 for Georges Cove Village, 319 instead of 374 for Georges Cove Marina and 146 instead of 996 for Warwick Farm Village.

- The additional flood modelling information does not change the results as the Martens report re-confirms the unacceptable hazards the site is exposed to and evacuation constraints and risk to life that would result from the proposal, even with proposed early evacuation and reduced vehicle numbers.
- The proposal introduces a new element of risk. The 'approved conditions' stated in the Martens report refer to the 2021 Development Application approved for the Marina, a recreational land use. The calculations assume that 'in a major flood event all the residential parking spaces will be occupied, and half the non-residential spaces would be occupied'. However, the reliance on the approved conditions is misleading as residents are much more likely to be on site overnight and have more valuables on site which may result in people taking longer to evacuate than for people on site for a recreational use.
- The revised evacuation modelling excludes consideration of the low point on the evacuation route along Brickmakers Drive. Brickmakers Drive has an elevation 5.7m AHD, however, the lowest point is at the Conlon Avenue intersection which has an elevation of 4.7m AHD. So, the evacuation route is likely to be cut off in a 2% AEP flood event. It is not possible to turn right into Maddecks Avenue from the site, and it is unreasonable to add another traffic control point managed by suitably trained persons during flooding events. NSW SES does not support strategies that require people to walk or drive through floodwater.
- There is an assumption that an 'early warning system' can be applied to the site. In practice, this approach seeks to increase flood forecasting timeframes. It is a difficult area with significant scientific and technological challenges. NSW SES partnered with Infrastructure NSW to determine if early forecasts are possible. The analysis found that increased flood forecasting timeframes increase the uncertainty of the flood occurrence. It triggers earlier warnings to sites with lower elevation that are likely to be affected by frequent flooding events. The additional information proposes the site is given early evacuation at the same time as subsector R25, which is flooded during small and frequent flood events, it would receive a greater number of "false alerts" which will generate complacency to warnings and result in risk to life. This would create significant challenges in successful evacuation when needed. In 2024, subsector R25 received two evacuation orders which would have resulted in false alerts for the subject site.
- Without an 'early warning system' in place, the actual number of vehicles trapped in flood water is likely to exceed 480 vehicles. It should be noted that the flood modelling assumptions are based on the M5 Motorway upgrades being complete.
- The NSW SES does not support the proposal's reliance on site specific emergency plans, and proposed body corporate coordinating the evacuation, as they are not trained in emergency management of flooding.
- The proposal should not rely on 'Shelter in Place' as a last resort, as it would be inconsistent with the Department's Shelter in Place policy. Although the proposed habitable floor levels are

proposed to be above the flood planning level, the buildings will be surrounded by high hazard deep water. Under these conditions emergency services may not be able to respond, rescue or resupply remaining occupants.

• The site is exposed to high hazard flooding, which poses significant risk to occupants that do not evacuate in time. Any occupants that choose not to evacuate or are trapped may be exposed to significant flood risks, such as, being surrounded by flooding. This is unsafe for people and vehicles, and all buildings are at risk of structural damage. Structural piers would have an impact on and be impacted by hazardous flood water flows. The proposed piers would be in a floodway and high hazard flood zone and required to be structurally sound in all flood events including high flood depth, velocity, hazard, debris loading, physical and chemical erosion to ensure lives of residents in floors above piers. The justification for this design compares the site to Sydney Harbour. However, Sydney Harbour ranges from 1.5km to 3km in width, whereas the Georges River is 100-120m width immediately adjacent to the site. The flow on the site is constrained to ten times less width than Sydney Harbour and is therefore not a like for like comparison.

Should you have any enquiries about this matter, I have arranged for Suzanne Wren, Manager Local Planning and Council Support to assist you. Ms Wren can be contacted on **Council**.

Yours Sincerely,

**Tina Chappell** Director, Local Planning and Council Support Department of Planning, Housing and Infrastructure

Encl: DCCEEW CPHR advice NSW SES response



Our ref: DOC25/269533

Ms Tina Chappell Director Local Planning Central West South Department of Planning, Housing and Infrastructure 4 Parramatta Square, 12 Darcey Street PARRAMATTA NSW 2150

18 April 2025

Attention: Oyshee Iqbal

Dear Ms Chappell

I refer to the discussions between the Department of Planning, Housing and Infrastructure (DPHI) and the Conservation Programs, Heritage and Regulation Group (CPHR) on the Independent Planning Commission's (IPC) review of the Gateway Determination for the Georges Cove Marina Planning Proposal (PP-2024-658).

As requested by DPHI, CPHR provides its advice having reviewed the additional flood risk assessment modelling provided by the applicant to the IPC on 28 March 2025. In summary CPHR considers that the additional modelling has not shown any difference to the flood constraints of the site.

Under the existing base case and post-development, the flood risk characteristics of the site are the same. The site and surrounds are flood affected under frequent, less frequent and rare flooding events based on flood modelling works undertaken by the applicant, council and the Department of Climate Change, Energy, the Environment and Water.

CPHR's view is that the site is unsuitable for residential development given the risk flooding would pose, even with the habitable floors of a building located above the Probable Maximum Flood (PMF) level, as proposed by the applicant.

#### Flood Risk Assessment

In summary,

- The site is situated on a floodplain and is impacted by both frequent and rare floods.
- The site would have a flood depth of 6 8 m and higher under the PMF Event and be inundated for around 36 hours or longer.
- The site is a floodway under the PMF Event with highest hazard level H6, meaning it is unsafe for vehicles and people and all building types considered vulnerable to failure.
- In a 5% Annual Exceedance Probability (AEP) the area would be inundated for around 20 hours and the hazard would be H5 meaning it is unsafe for vehicles and people.

The additional information has also failed to address the Local Planning Direction 4.1 - Flooding. Specifically, a planning proposal must not contain provisions that apply to the flood planning area which:

- permit development in floodway areas
- permit development for the purposes of residential accommodation in high hazard areas
- permit a significant increase in the development and/or dwelling density of that land
- are likely to result in a significantly increased requirement for government spending on emergency management services, flood mitigation and emergency response measures, which can include but are not limited to the provision of road infrastructure, flood mitigation infrastructure and utilities.

#### Evacuation and emergency management response

I understand that the NSW State Emergency Service will provide detailed advice on evacuation and emergency management responses.

The additional flood risk assessment is considered inadequate since it does not provide a holistic assessment of the evacuation requirements across the catchment. Safe evacuation from the site during major flooding events is restricted due to the existing capacity of the road network and the nature of available flooding warning products.

If you have any further questions about this issue, please contact Susan Harrison, Senior Team Leader Planning, on the second or at the second second

Your sincerely



Louisa Clark Director Greater Sydney Regional Delivery, Conservation Programs, Heritage and Regulation



Our Ref: ID 3050

15 May 2025

Oyshee Iqbal Department of Planning, Housing and Infrastructure 188 Macquarie Street Dubbo NSW 2830

Via email

email:

Dear Oyshee,

#### Planning Proposal for Georges Cove 146 Newbridge Road Moorebank

Thank you for the opportunity to provide comment on the additional responses by Martens and the accompanying Corrs Cover letter and EMM IPC submission, in support of the Independent Planning Commission Review of 146 Newbridge Road, Moorebank. We also refer to our previous advice dated 29 January 2024, 29 April 2024 and 12 November 2025.

The NSW SES recommend that the planning proposal does not proceed, as the planning proposal still:

- does not adequately demonstrate that the flood risk can be managed
- is not able to be evacuated in time, and sees 277 vehicles trapped while evacuating
- is exposed to high-hazard flooding.

These issues are further elaborated in Attachment A, and is consistent with our previous advice dated 12 November 2024, 29 April 2024, and 29 January 2024.

Please feel free to contact Peter Cinque via email at should be should you wish to discuss any of the matters raised in this correspondence. The NSW SES would also be interested in receiving future correspondence regarding the outcome of this referral via this email address.

Yours sincerely,



STATE HEADQUARTERS 93 - 99 Burelli Street, Wollongong 2500 PO Box 6126, Wollongong NSW 2500 P (02) 4251 6111 F (02) 4251 6190 www.ses.nsw.gov.au ABN: 88 712 649 015





Allison Flaxman A/Assistant Commissioner – Director, Emergency Management NSW State Emergency Service



# The Planning Proposal still does not adequately demonstrate that the

## flood risk could be managed

The IPC Cover Letter states that "A central tenet of the Gateway determination under review was that the PP did not adequately demonstrate that flood risk could be managed during the future mixed use development of the Site. In particular, the PP:

(i) was inconsistent with Local Planning Direction 4.1 Flooding (Direction 4.1). Further, according to the Biodiversity, Conservation and Science division of DCCEEW, the PP does not rely on the latest data available in relation to flood risk;

(ii) does not demonstrate site-specific merit in relation to flood risk, particularly as it is inconsistent with the NSW Flood Prone Land Policy; and

(iii) will facilitate development that absorbs evacuation capacity for future development within Moorebank East and Chipping Norton."

The further work undertaken and documented in the Martens Report continues to demonstrate that the three points above hold true and that **the Planning Proposal still does not adequately demonstrate that the flood risk could be managed**, as further detailed in our response below.

The IPC Cover Letter claims that the "Martens Report also makes a number of additional findings and recommendations on matters not cited in the Gateway determination Statement of Reasons. These demonstrate that ... all necessary measures have been considered in reaching the Report's conclusions about the acceptability of the PP from a flood risk perspective."

Although adding additional information may show that more has been considered, this additional information does not change the results, and the Martens report actually reconfirms the unacceptable hazards the site is exposed to, and the evacuation constraints and risk to life as a result of the PP, *even with* proposed early evacuation and reduced vehicle numbers.

# The Revised Evacuation Modelling Excludes Important Vehicle Numbers

The proponent's updated evacuation model does not include a number of locations, which results in an underestimation of the risk.



ort states *"The approved conditions model considered approximately* accuating the floodplain, approximately 3,000 more than the Molino Stewart

LSM [Life Safety Model] Scenario A<sup>"1</sup>, however, did not clearly highlight that Scenario B in the Molino Stewart LSM modelled 69,000 vehicles evacuating from the floodplain.<sup>2</sup>

In total, the evacuation model in **this report has chosen to exclude 38068 vehicles from their modelling** compared to the Molino LSM, as identified in Table 13 of the report.<sup>3</sup>

The following sites have been excluded from the updated evacuation model:

- 124 Newbridge Road Moorebank (795 vehicles in the Molino model<sup>4</sup>)
- Lot 2 Newbridge Road Moorebank (1611 vehicles in the Molino model)
- Moore Point Precinct (25088 vehicles in the Molino model)
- Moore Point Rose Group (6711 vehicles in the Molino model)
- Warwick Farm Structure Plan (2713 vehicles in the Molino model).

The updated model also assumes lower numbers for other sites, stating the reasoning as *"vehicle populations were calculated by the assuming the approved car parks were at 50% capacity":*<sup>5</sup>

- 176 instead of 585 for Georges Cove Village
- 319 instead of 374 for Georges Cove Marina
- 146 instead of 996 for Warwick Farm Village.

The only site with an increase in vehicle numbers compared to the Molino model is Shepherd Street Precinct, with 1424 instead of 1200 vehicles.

Further, the increase in the number of vehicles assumed to be on the site as a result of the PP compared to the approved DA, as Table 14 in the Martens Report states that 319 vehicles have been assumed for the "approved" Georges Cove Marina scenario, and 528 vehicles have been assumed for the "proposed" Revised Georges Cove Marina scenario. Therefore, the PP introduces 209 additional vehicles compared to the "approved" scenario.

<sup>&</sup>lt;sup>1</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, Moorebank NSW. Page 47

<sup>&</sup>lt;sup>2</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, Moorebank NSW. Page 42.

<sup>&</sup>lt;sup>3</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, Moorebank NSW. Table 13, page 48.

<sup>&</sup>lt;sup>4</sup> Molino Stewart.

<sup>&</sup>lt;sup>5</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, Moorebank NSW. Page 48.



# The proposal introduces a new element of risk in terms of residential development

The "approved conditions" stated in the report refer to the 2021 approved DA for the Marina (recreational usage).<sup>6</sup> The calculations assume "that in a major flood event all the residential parking spaces will be occupied, and half the non-residential spaces would be occupied."<sup>7</sup>

This comparison is misleading, as by introducing residential on the site this introduces a fundamentally different usage type; people are much more likely to be on a residential site overnight, have more valuables located on site which may result in people taking longer to evacuate than for a recreational site, etc.

# The Revised Evacuation Modelling Excludes the Consideration of Critical Low Point on the Evacuation Route along Brickmakers Drive

NSW SES evacuation planning is based around when an area would lose the last available emergency evacuation route egress. The Martens Report states that *"Car access to the proposed development is from Brickmakers Drive over the Promontory Way vehicle bridge onto Spinnaker Drive and then through to the entry road for the marina from the site's northwest corner. The low point on this route is at the access point with Brickmakers Drive which has an elevation of approximately 5.7 mAHD, and would therefore be cut off for vehicular access at 6.0 mAHD (i.e. 300 mm depth) by flooding in events as frequent as the 0.2% (1 in 500 AEP) flood event, representing a conservative approximation of 1% AEP climate change conditions."<sup>8</sup>* 

Firstly, the road height out of the site onto Brickmakers Drive is 5.7m then the road is cut at 5.7m (not 6m). This is the height also in NSW SES emergency planning for this location. **NSW SES do not support strategies that require people to drive or walk through floodwater.** 

More importantly, "there is a low point on Brickmakers Drive just north of the intersection with Conlon Avenue with an elevation of approximately 4.7 mAHD which can be cut off by high hazard flooding in **events as frequent as the 2% AEP** (1 in 50 AEP) flood".<sup>9</sup> It is not possible to

- <sup>8</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, Moorebank NSW. Section 3.1 Resilience Measures, page 37.
- <sup>9</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, Moorebank NSW. Section 3.4.3, page 41.

<sup>&</sup>lt;sup>6</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, Moorebank NSW. Table 14, page 49.

<sup>&</sup>lt;sup>7</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, Moorebank NSW. Page 49.



addecks Avenue from the site, and it would not be reasonable to add an I traffic control point to justify the development at this location. There is also another low point to the north of the site on Brickmakers Drive with an elevation of approximately 4.8m AHD, however it is not clear if there will be right turn onto Brickmakers from the site. It is therefore most likely that the 4.7m AHD low point would be the **trigger point at which all people would need to be out of the area, not 6 metres.** 

# There is an Assumption that the Site can be Warned Earlier

"The LSM assumes that 12 hours of warning time will be available. However, in the event of a flood the magnitude and duration of the EFE, it is likely that several days of warning time will be available." <sup>10</sup>

However, currently the confident warning timeframe for the Milperra flood gauge is around 6 hours for minor to moderate floods, and 12 hours for floods above 4 metres as specified in the Bureau SLS with a flood peak forecast criteria  $(70\% + - 0.3m)^{11}$ .

A risk treatment option that is often offered up is to attempt to increase flood forecasting timeframes. This is often framed as "early warning systems". Increasing warning timeframes is a difficult area with significant scientific and technologic challenges to overcome.

Under Section 8(1)(a) of the *SES Act 1989* the NSW SES is responsible for the establishment of flood warning systems. These arrangements are outlined in the State Flood Plan, Supplementary State Flood Plan document: Provision of and requirements for flood warning and the Intergovernmental Agreement on the Provision of Bureau of Meteorology Hazard Services to the States and Territories.

The Bureau of Meteorology has national responsibility for providing flood warnings for riverine flooding<sup>12</sup>. Currently the Bureau uses a range of 'deterministic' models (around 8 to 10) to provide ensemble flood forecasts for Bureau flood forecasters. These models use a range of global and local weather models to forecast rainfall in catchment areas. Ensemble forecast techniques are used around the world to provide more robust rain and flood forecasts. The Bureau has been a leader in this area.

<sup>&</sup>lt;sup>10</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, Moorebank NSW, page 45

<sup>&</sup>lt;sup>11</sup> Bureau of Meteorology. 2024. Service Level Specification for Flood Forecasting and Warning Services for New South Wales and the Australian Capital Territory – Version 3.15

<sup>&</sup>lt;sup>12</sup> Council of Australian Governments. 2018. Inter Government Agreement on the provision of Bureau of Meteorology Hazard Services to the States and Territories



thered with Infrastructure NSW to implement the Hawkesbury-Nepean improve flood warning in the Hawkesbury-Nepean Valley, including the Probabilistic Forecast Service Project and Flood Forecastability Project to determine if early forecasts are possible. A key finding from the project is that the confident flood forecasting timeframe is not necessarily extended by this approach, but it does quantify the range of uncertainty for longer forecast timeframes.

### The Proposed Early Evacuation Trigger would be triggered often

The proposed "trigger" occurs at moderate flooding at the Milperra Gauge. This is likely to see a significant number of false alarms. The expected number of false alarms (i.e. site evacuation with no inundation) due to the early triggers associated with the site, would have significant long-term social, psychological and economic impacts. This rate of false alarms would also generate complacency, resulting in risk to life and significant challenges in successful evacuation. Big floods will almost always catch people by surprise and exceed their capacity to deal with the situation unless they have considered this scenario in their planning and preparedness. In addition, there is an increased risk of reputational damage to the decision-maker, the local council, the developer and NSW SES.

The report suggests "sub-sector R7, which includes the site, could be evacuated shortly after sub-sector R25, which is the first sub-sector to be evacuated ... This would be either by SES control or by a self-evacuation trigger actioned by the body corporate through implementation of a flood emergency management plan" - page 7

The subsector R25 is comprised of the remaining sites left over from the voluntary house purchasing program, and is triggered in very small and frequent events (in a moderate flood). Unfortunately triggering evacuation in such frequent flood events is likely to exacerbate complacency due to large number of false alarms.

As a recent example, in 2024 alone, the subsector R25 was warned to evacuate twice, in April and in June. Based on the proposed early warning system, which is not supported by NSW SES, each of these floods would have resulted in "false alerts" for Georges Cove.

# The Evacuation Model demonstrates that a significant number of people are still trapped in floodplain

Even with several key proposed sites in the floodplain excluded from the modelling as detailed above, an M5 upgrade, the assumption that an early warning would be feasible and with a higher critical evacuation low point, a significant number of vehicles would be trapped in the floodplain in the PMF which would be a direct risk to life.



rt assumes timings for notification of subsectors, without identifying where aken from or who would provide these notifications. Examples in the report

of these assumed timings are in the statements "2.5 hours after sub-sector R25 is notified, sub-sectors I3, I5, I 13 and R26... are the next sub-sectors to be notified to evacuate"<sup>13</sup> and "the LSM model was amended to reflect a 3 hour earlier warning time of 1.5 hours after sub-sector R25".<sup>14</sup>

The Martens Report also states, "In the proposed case with the PP site (Site D) included and, together with the Georges River Cove site (Site A), evacuated using the earlier trigger, the LSM modelling indicates that the number of vehicles trapped on the floodplain is reduced to 277".<sup>15</sup> In other words, even with using an earlier trigger (which as noted above may not be feasible without requiring either additional burden on NSW SES resources or relying on people on-site to perfectly follow the private evacuation plan) and not including several proposed developments in the area in the evacuation modelling, 277 vehicles – therefore 277 or more people than if the PP did not go ahead – would become trapped.

This is a direct risk to life for more than 277 people, *as a result of* this PP site. This directly contradicts the statement made in the report which suggests *"The evacuation modelling therefore demonstrates that safe off-site evacuation can be readily achieved for a future urban development at the PP site"*, <sup>16</sup> as the modelling clearly demonstrates that *even with* proposed early evacuation triggers, safe off-site evacuation for all persons **cannot** be readily achieved for a future urban development at the PP site.

### The Potential Number of Trapped Vehicles is Much Greater than Calculated

The IPC Submission Planning Letter states "b. The PP is strategic because it has considered flood risks across the LGA and Georges River floodplain. Updated evacuation modelling demonstrates that the PP will not detrimentally impact on the evacuation capacity of others on the floodplain, Clause Provision Assessment and provides an opportunity to improve existing evacuation capability through early co-ordinated site evacuation."

<sup>&</sup>lt;sup>13</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, Moorebank NSW. Pages 4 and 5.

<sup>&</sup>lt;sup>14</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, Moorebank NSW. Page 5.

<sup>&</sup>lt;sup>15</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, Moorebank NSW. Page 5.

<sup>&</sup>lt;sup>16</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, Moorebank NSW. Page 5.

The report makes another similar statement: "Modelling demonstrated that the entire site would be capable of evacuating without impacting other persons on the floodplain also evacuating." – Page 7.



this is misleading, as the evacuation modelling results shows at least 277 come trapped in a PMF (based on early evacuation triggers which may not

be met in reality). We recommend the assumption of early evacuation should not be included in modelling due to uncertainty of human behaviour (including warning acceptance) during disaster events.

Table 14 on page 49 of the report shows an increase in the number of vehicles assumed to be on the site as a result of the PP compared to the approved DA, as they assume *"that in a major flood event all the residential parking spaces will be occupied, and half the non-residential spaces would be occupied."*<sup>17</sup> This table states that 319 vehicles have been assumed for the "approved" Georges Cove Marina scenario, and 528 vehicles have been assumed for the "proposed" Revised Georges Cove Marina.

Therefore, the number of additional vehicles introduced in the proposed scenario is:

### 528 'proposed vehicles' - 319 'approved vehicles' = 209 additional vehicles.

The difference between 'approved' and 'proposed' scenario modelling in this report, assuming an already saturated evacuation network (and therefore a linear relationship for any new vehicles added to the site), is:

- 'approved' modelling calculation, and
- adding 209 vehicles (see table & calculation above), and
- adding 3 hours of early warning/evacuation time.

To remove the early evacuation assumption, this would therefore be:

• 'approved' modelling calculation + 209 vehicles.

Therefore, as the report states 296 vehicles would be trapped in the 'approved conditions', the number of vehicles trapped under 'proposed conditions' without early evacuation using their evacuation model is estimated to be:

• 296 'approved' vehicles + 209 additional vehicles = **505 vehicles trapped due to PP.** 

Assuming an already saturated evacuation network is a reasonable assumption to make, as vehicles are trapped in the floodplain in all scenarios shown in the modelling provided.

<sup>&</sup>lt;sup>17</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, Moorebank NSW. Page 49



also been run for assuming the M5 upgrade (with additional lanes). As with ithout the M5 upgrade introduced, we can redo this calculation to remove

the 3hrs assumed early warning time, as this is not supported by NSW SES. The number of trapped vehicles with the assumption of the completion of the M5 upgrade is:

273 trapped in 'approved conditions' + 209 more vehicles in 'proposed conditions'
= 482 vehicles trapped (assuming completion of M5 upgrades)

# There is Reliance on Private Emergency Plans and Personnel that are not trained in Emergency Management or Flooding

Flood Emergency Management Plans (FEMPs) do not adequately mitigate flood risk for this site, as they are not considered a reliable way to manage significant underlying flood risk.

The proposed plan envisions that early evacuation of the site *"can be readily implemented either through a site specific FEMP with warning system managed by Body Corporate enforced via consent conditions, NSW SES consultation and/or SES sub-plan amendments."<sup>18</sup> However, NSW SES and BOM do not provide site-specific warnings. Having areas with multiple private or site-specific flood warning systems, each with varying efficacy, increases the complexity of deriving flood warning advice at the community scale. It is also more challenging to monitor these flood warning systems and effectively incorporate information into strategic emergency management for the community. Private warning systems require ongoing maintenance, monitoring and testing. These are not monitored nor maintained by NSW SES, and SES have no oversight to ensure this is being maintained. Requiring SES to become involved with private warning systems would be an additional burden on government resources. The NSW SES, therefore, does not support the use of private or site specific warning systems for individual developments that have not been developed in a strategic context<sup>19</sup>.* 

The proposal relies on a body corporate to manage emergency response, "The PP would see a future development managed by a body corporate which would function to ensure that any continuing flood risks and flood emergency response would be centrally managed, ensuring that risk management measures such as signage, warning systems, flood alarms, evacuation procedures and flood wardens, would be funded and operational in perpetuity" <sup>20</sup>

<sup>&</sup>lt;sup>18</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, Moorebank NSW

<sup>&</sup>lt;sup>19</sup> NSW Government. 2023. EM01: Support for Emergency Management Planning, Section A2.6 Flood warning, page 12

<sup>&</sup>lt;sup>20</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, page 7



e only way to ensure everyone is notified. If this is not being done by NSW expectation (and risk to life associated with this task) will be transferred

to Flood Wardens. The Flood Wardens will not have the training or experience to manage flood operations and may contradict and impede the broader strategies employed by NSW SES during a flood emergency.

The report also heavily relies on NSW SES for warnings, as well as relying on evacuation centres being opened, with statements in the report such as:

- "The NSW SES can communicate evacuation orders to site management and site management can then action and assist with / manage the evacuation."<sup>21</sup>
- "In the event of a major flood the BoM and the NSW SES will provide numerous warnings"<sup>22</sup>; and
- "The primary emergency response strategy for the site will be early vehicular evacuation based on BoM flood warnings and SES evacuation orders to a nominated evacuation centre or alternative accommodation outside the floodplain."<sup>23</sup> page 38

Direct communications with the NSW SES, requesting further SES consultation and/or SES sub-plan amendments *is* a burden on NSW SES resources. As stated above, NSW SES and the Bureau of Meteorology do not provide site specific warnings for buildings.

Planning Proposals should not rely on the assumption that evacuation centres will be open. Residents are advised to relocate outside of the PMF flooding, preferably to friends and or family, to reduce the risks associated with inundation and isolation. A small quantity of evacuees relocate to an evacuation centre, however, the location and timing of evacuation centres opening may vary between events.

<sup>&</sup>lt;sup>21</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, Moorebank NSW. Page 48. Other similar quotes from the report also include: *"The NSW SES can communicate evacuation orders to site management and site management can then action and assist with / manage the evacuation. There is no material change in demand to the NSW SES resourcing to provide the earlier warning" - page 48.* 

<sup>&</sup>quot;ensuring that SES resources would not be burdened and would be most efficiently utilised" and "these two locations...would be capable of initiating an earlier evacuation either by direct communications from the NSW SES or by a self-evacuation trigger through a FEMP" - page 5.

<sup>&</sup>lt;sup>22</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, Moorebank NSW. Page 39.

<sup>&</sup>lt;sup>23</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, Moorebank NSW. Page 38.



*nsing v Snowy Valley Council* [2022] NSWLEC 1486, the Commissioner found r development relied too heavily on the SES to provide appropriate and timely response, which the SES themselves recognise may not be feasible when needed. The Commissioner concluded the site was not suitable for the proposed development due to an unacceptable risk to life and likely adverse social impact to the locality during evacuation of the site.

The Martens Report references the Penrith Lakes Scheme Early Flood Evacuation Guideline and Emergency Management Plan, however this was not supported due to the risk to life and property.

The Martens Report states "For example, the June 2022 Penrith Lakes Stage 1 Development Control Plan requires that all new development must be either strata or community title, and that the managing body must implement a flood emergency management plan to ensure evacuation requirements. " - page 7

Although this statement is partly true, it misrepresents the whole picture. For the 2022 Penrith Lakes Stage 1 DCP, all new development must be either strata or community title, the managing body must implement a FEMP to ensure evacuation requirements, AND there significant restrictions on what can be built on the site AND capacity restrictions to ensure that with modelling people can safely evacuate the floodplain, which this current proposal has not sufficiently demonstrated.

# Shelter in Place and Pedestrian Evacuation are still proposed

Shelter in place is identified as a last resort option, with the claim that the site would comply with shelter in place guidelines because the evacuation route is not affected by flash flooding and is not a primary strategy, only a last resort option. Importantly, any remaining people on the site that have sheltered in place may be exposed to significant flood risks and secondary risks.

Although we understand that the Habitable Flood Levels are proposed to be above the Flood Planning Level, however it is important to also understand that the buildings will be surrounded by high hazard deep water. Under such conditions, emergency services may not be able to respond, rescue or resupply any remaining occupants.



poses pedestrian evacuation which is against NSW SES previous advice<sup>24</sup> .

# The Site is Exposed to High Hazard Flooding, Posing a Significant Risk to Occupants that Fail to Evacuate in Time

Any occupants that either choose not to evacuate, or are trapped may be exposed to significant flood risks, which are not safe for people or vehicles and all buildings are at risk of structural damage, *"Flood hazards outside of the marina basin are H3 for the 20% AEP event, H4 for the 10% AEP flood event, H5 for the 5% to 0.5% AEP flood events, and H6 for the 0.2% AEP flood event and greater."*<sup>25</sup>

Structural piers supporting the urban footprint are not insignificant and would have impact on and be impacted by hazardous flow. These piers would be located within a floodway and high hazard flood zone, and are required to be structurally sound in all flood events (including high flood depth, velocity, hazard, debris loading, physical and chemical erosion, etc.) in order to ensure the lives of the persons in the residential floors above the piers.

The Report justifies the use of the piers as, "In Sydney Harbour there are numerous examples where urban development has successfully occurred suspended on piers over deep water. Importantly for this site, flooding conditions below the future urban footprint arise artificially because of historical extraction activities at the site which has created a large pool of open water where velocities are very low and do not present any difficulty for future structural design and construction."<sup>26</sup> Sydney harbour typically ranges between 1.5km and 3km in width; by comparison, the Georges River is approximately 100-120m width immediately adjacent to this site, or up to approximately 350-380m width if it were to include the entire width of the PP lot. The flow on this site is constrained to 10x less width than Sydney Harbour – it is therefore not considered to be a relevant example for comparison. Although the hazard appears to be primarily depth driven (Map P29, page 136), in a PMF this site becomes a floodway. (Map P31, page 138). This poses a considerable risk (to the piers etc) and must not be ignored.

### Conclusion

<sup>&</sup>lt;sup>24</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, 3.3 Flood Emergency Management Plan

<sup>&</sup>lt;sup>25</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, Section 2.3.3.3 Flood Hazards

<sup>&</sup>lt;sup>26</sup> Martens. March 2025. Flood Risk Assessment: A Review of Flooding and Evacuation for the Georges Cove Marina Planning Proposal, page 6 and 7



W SES position has not changed and supports the NSW Department of and Infrastructure (DPHI)'s decision to refuse the Planning Proposal as it still:

- does not adequately demonstrate that the flood risk can be managed
- is not able to be evacuated in time, and sees 277 vehicles trapped while evacuating
- is exposed to high hazard flooding.