Department of Climate Change, Energy, the Environment and Water

Your ref: PP-2024-658
Our ref: DOC23/1124472

Ms Gabrielle Coleman
Senior Planning Officer
NSW Department of Planning, Housing and Infrastructure

By email: Gabrielle.Coleman@planning.nsw.gov.au

Dear Ms Coleman

Thank you for your email received 5 October 2024 to the Biodiversity, Conservation and Science Group (BCS) NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) requesting advice on the Gateway Review request for the Georges Cove Marina Planning Proposal located at 146 Newbridge Road, Moorebank (proposal).

BCS understands that on 11 July 2024 the Department of Planning, Housing and Infrastructure (DPHI) determined under section 3.34(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) that the proposal should not proceed.

BCS has reviewed the Gateway Review request comprising the letter from the proponent dated 4 October 2024 and supporting additional information and advises that the Gateway Review request does not address BCS' recommendations dated 9 February 2024 (ref DOC23/1124472).

BCS provides its detailed advice at Attachment A.

If you have any further questions about this issue, please contact Dana Alderson, Senior Project Officer Planning at dana.alderson@environment.nsw.gov.au.

Yours sincerely

S. Harrison

14/11/2024

Susan Harrison
Senior Team Leader Planning
Greater Sydney, Regional Delivery
Biodiversity, Conservation and Science

Attachment A

BCS advice on Gateway review for Planning proposal at 146 Newbridge Road, Moorebank

BCS has reviewed the:

- Georges River Floodplain Risk Management Study and Plan (Bewsher Consulting, May 2004)
- Georges River Flood Study (BMT, 2020)
- Georges River Evacuation Modelling (Molino Stewart, March 2022)
- Letter to proponent – Planning proposal PP-2024-658 to amend Liverpool Local Environmental Plan 2008 (DPHI, 11 July 2024)
- Gateway Determination – Planning proposal (Department Ref: PP-2024-658) (DPHI, 11 July 2024)
- Letter from proponent – Planning Proposal PP-2024-658 to amend Liverpool Local Environmental Plan 2008 – 146 Newbridge Road Moorebank (Mirvac, 4 October 2024) (Proponent Letter)
- Planning response – Planning proposal PP-2024-658 to amend Liverpool Local Environmental Plan 2008 (EMM Consulting, 4 October 2024) (Planning Response)
- Flooding response – Mirvac Planning Proposal – reply to Gateway Determination Report (Tooker and Associates, 30 September 2024) (Flooding Response)
- Evacuation Strategy Review Moorebank Marina Planning Proposal (Risk-E Business Consultants P/L, 27 September 2024) (Evacuation Strategy Review)
- Mirvac Georges Cove Marina (Site D) Modified Planning Proposal Flood Impact Assessment (FIA) and Flood Emergency Response Plan (FERP) (Tooker and Associates, August 2023).

Compatibility of the proposal with the flood risk of the site

BCS previously advised that:

> *The flood data and recently completed flood studies including the Georges River Flood Study (BMT, 2020) indicate that the proposed future development may not be compatible with the flood risk of the site.*

The proposed development will significantly increase the population on flood prone land and has the potential to impact flood evacuation of the existing community.

For the reasons outlined below, the Gateway Review request does not demonstrate consistency with the following elements of Ministerial Direction 4.1 – Flooding:

- *Direction 4.1(3) – A planning proposal must not contain provisions that apply to the flood planning area which:*

  (c) permit development for the purposes of residential accommodation in high hazard areas,

  (d) permit a significant increase in the development and/or dwelling density of that land, and

  (g) 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.

- *Direction 4.1(4) – A planning proposal must not contain provisions that apply to areas between the flood planning area and probable maximum flood to which Special Flood Considerations apply which:*

  (c) permit a significant increase in the dwelling density of that land,

(e) are likely to affect the safe occupation of and efficient evacuation of the lot, or

(f) are likely to result in a significantly increased requirement for government spending on emergency management services, and flood mitigation and emergency response measures, which can include but not limited to road infrastructure, flood mitigation infrastructure and utilities.

Use of latest flood information to inform land use planning

The Gateway Review request has not adequately addressed BCS advice, as the proposal continues to utilise the Georges River Floodplain Risk Management Study and Plan (Bewsher Consulting, May 2004) (2004 study) to support the rezoning of the site.

BCS advises that it is critical to use the best available information to determine the flood compatibility of the proposal so that future development is sustainable and resilient, does not incur risk to communities and infrastructure, and increase costs for Council and agencies.

Issues with reliance on the 2004 study and data, when contrasted with the benefits of the newer Georges River Flood Study (BMT, 2020) are outlined below.

Georges River Flood Study (BMT, 2020)

The 2020 flood model provides the best representation of the Georges River Catchment for assessing the flooding conditions along the floodplains where the proposal is located, which is why BCS recommends use of this model.

This more recent flood study model is based on the updated topographical (LiDAR) and bathymetric (hydro-survey) data in the study area. A 2D (two-dimensional) model was developed for the assessment of flooding conditions. The hydrological inputs (i.e. design inflows) to the 2020 flood model are similar to that adopted in the 2004 flood model. However, the adopted loss parameters of the 2020 flood model are based on calibrated loss in the catchment.

BCS advises that the 2020 flood model has not yet been adopted by Council as community consultation is required for amendment of the Flood Planning Area (FPA) within the Liverpool Local Government Area (LGA) portion of the study area. The fact that the 2020 flood model it is not adopted does not mean that it should be disregarded, or that the data is not valid.

In fact, the 2020 model is currently in use for assessment of land use planning and development impacts within the Liverpool LGA. For example, a truncated model was developed earlier this year for the assessment of flooding impacts for the Moore Point Planning Proposal (PP-2022-1602) by using the 2020 flood model. The 2020 model was also used for the Liverpool Private Hospital Planning Proposal (PP-2021-7276).

Flood Impact Assessment based on Georges River Floodplain Risk Management Study and Plan (2004)

The flood model adopted in the Georges River 2004 study was based on an updated Mike11 Model, which was developed in 1999 during the flood study stage. This is an 1D (one-dimensional) flood model, which represents the main river and creek lines. The floodplains of the study were modelled by extending the cross-sectional data across the floodplains.

The proponent has used a truncated version of the 2004 flood model for flood impact assessment at the development site. The inflow boundaries of this model have been adopted just upstream of the proposed site. The tailwater boundary has been defined just downstream of the proposed site.

The model estimates average velocities at cross sections since it is an 1D flood model, which does not consider the variation of channel shapes and floodplains. These are depth-averaged velocities across modelled cross sections (or areas of interest), which are expected to be lower than the estimated peak velocities from a 2D model.

The assessment of hydraulic functions (i.e. floodway, flood storage and flood fringe areas) based on a 1D model is considered to have lower ratings than a 2D model, which analyses the 2-dimensional flood conditions along main channels and its floodplains.

The proponent highlighted that the incremental flooding impacts at the proposed site because of development would be small and/or insignificant (i.e. the changes of flooding characteristics from existing conditions to the post-development stage). The FIA should be undertaken for both existing conditions and the post-development stage individually since the site is flood affected mainly due to upstream inflows, not by local inflows.

The Flooding Response and Planning Response have both raised concerns that the 2020 model is based on a historical landform and does not reflect the approved landform for the site under DA-611/2018, or that proposed in the current proposal. The proponent has indicated that the existing, approved and proposed landform of the site should be considered in flood mapping.

Whilst the flood maps of the 2020 model are based on the previous landform (sand mining), the anticipated floodwater depth at the site for the full range of flooding events is possible to interpret by considering the flood depth of adjoining areas shown in the 2020 model.

Flooding hazard and risk

The proposed site would be flood affected in frequent events such as an 10% AEP event with a floodwater depth of around 0.5 m. The floodwater depth would be around 2 to 5 m under an 1% AEP event. The proposed site and adjoining areas would be significantly flood affected under the PMF event and the floodwater depth would be around 6 to 10 m and higher. The site would be isolated for extended periods during major flooding events including the PMF event.

The hazard rating for the site under an 1% AEP event would be H5 to H6, which is considered high and is unsafe for people and vehicles. The site is considered to be a high-risk precinct based on the hazard rating for the design flooding events (Georges River Flood Study, BMT, 2020). The proposed site would act as flood storage and flood function areas under the PMF event.

Georges River floodplain

The statement in the Proponent Letter that the Georges River floodplain is significantly different from other floodplains in NSW due to slow rising flood is inaccurate. The flooding characteristics are dependent on catchment areas, upstream inflows and tailwater levels including any hydraulic restrictions along the river reaches. The flooding patterns for the Georges River and the Hawkesbury-Nepean River are similar, but the intensity (e.g. duration of inundation) differs in the Hawkesbury-Nepean River due to its larger contributing catchment.

Emergency management

Warning time of 36 hours

The rate of rise and fall of flood levels for 36 hours under an 1% AEP event has been considered as available warning time for the development site in the Proponent Letter. This is not an accurate interpretation of the warning time. The flood warning is issued based on triggering water levels at nominated water level monitors, prevailing weather conditions, trends in water levels and forecast rainfall in a catchment.

The actual warning time for the Georges River would be around 9-12 hours. This is the time available for evacuating the flood impacted areas before the road networks are disconnected by floodwater and the residents are trapped for an extended duration. Warning times should be confirmed by the NSW SES.

Evacuation

The proposed development site is expected to be isolated for 24 hours and longer under major floods including the PMF event. The evacuation modelling in the Georges River Evacuation Modelling – Flood Evacuation Analysis, Final (Molino Stewart, March 2022) indicates that the flood impacted residents in the Moorebank East precincts would not be able to evacuate safety, along with existing flood impacted residents in the Chipping Norton area, during major flooding events including the PMF event.

Upgrade works at Nuwarra Road would be required to lessen evacuation constraints for the Moorebank East precincts. However, this is not considered to be a desirable outcome given it would prioritise evacuation of new development at the Moorebank East precincts over existing Chipping Norton residents.

The development of Moorebank East precincts will compromise the safe evacuation of the Chipping Norton community unless a holistic and integrated approach is adopted to improve the safe evacuation of the flood impacted communities.

Consistent with its previous advice, BCS recommends:

- an adaptive planning approach (or development sequencing) for planning proposals in Moorebank and surrounding areas to address and mitigate flooding impacts under major and extreme flooding events
- a review is undertaken of the evacuation constraints and emergency conditions for the Liverpool CBD and adjoining areas, including the subject site and Moore Point having regard to Molino Stewart (2022).

END OF SUBMISSION