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NSW Department of Planning, Industry and Environment

RE: FEEDBACK ON DRAFT MAMRE ROAD PRECINCT DEVELOPMENT CONTROL PLAN

Thank you for the opportunity to provide feedback to Penrith City Council's *Draft Mamre Road Precinct Development Control Plan* (November 2020[1]). This correspondence outlines our comments and associated recommendations to this document and associated *Mamre Road Flood, Riparian Corridor and Integrated Water Cycle Management Strategy* (Sydney Water 2020[2]). We would, however, welcome the opportunity to meet with relevant personnel from NSW Department of Planning, Industry and Environment (and other stakeholders, if appropriate) to provide clarification or discuss anything further.

As Ocean Protect are focused on protecting the health of waterways from stormwater, our feedback is primarily focused on stormwater management elements of the DCP and associated FRCIWCMS.

- **Item 1 – Stormwater runoff objective:** It is anticipated that the stormwater runoff limit is too low, is based on very limited science, and will be impractical – for a range of reasons including (but not limited to):
    - No practical conceptual scenarios (or 'real world' case studies) have been provided (or are otherwise available) to demonstrate that compliance with the given target (of 1.9ML/ha/year). The given scenarios apply assumptions that are anticipated to be incorrect and likely exaggerate runoff reduction rates for potential WSUD elements (see next point regarding Table 13 of FRCIWCMS).
    - The actual achievement of these objectives will require significant initial and ongoing resources for asset managers (e.g. managing harvesting, treatment and reuse infrastructure) and will be highly unlikely to be practical for the majority of new development. Whilst we recognise that hydrologic impacts of urbanisation should be appropriately mitigated, it is likely that flow reductions may be best achieved (at least in part) external/ downstream of individual development sites (particularly for industrial/ commercial sites whether opportunities for reuse and infiltration will likely be limited).
    - The scientific basis for the given target is very limited – and highly unlikely to justify the expenditure that will be required to achieve the given targets. No information is provided in relation to the extent/ quality of baseline hydrology data available (and used in the development

[1] Penrith City Council (November 2020), *Draft Mamre Road Precinct Development Control Plan*, https://www.planningportal.nsw.gov.au/MamreRd-DCP
[2] Sydney Water (October 2020), *Mamre Road Flood, Riparian Corridor and Integrated Water Cycle Management Strategy*, https://www.planningportal.nsw.gov.au/MamreRd-DCP

of the DCP and associated FRCIWCMS. Page 46 of the FRCIWCMS states that "available data is limited" for baseline hydrology – whilst page 48 states that "The Government endorsed stormwater management approach (for the site) may lie in between (the) two scenarios (of "Industrial + Business As Usual" and "Industrial + Parkland")", noting page 48 also states that the 'Parkland' approach provides "an **ideal** level of stormwater volume and flow management to ensure a low risk" (and is unlikely to be even remotely practical or cost-effective).

- The use of mean annual runoff volume runoff as the only hydrologic parameter/ indicator is overly simplistic and has minimal scientific justification. In particular, it is anticipated that a significant portion of average annual runoff volume would be associated with large/ infrequent rainfall/ runoff events, which any increases to (due to development) may have minimal impact to waterway values – particularly relative to small/ frequent runoff events.

It is also unclear whether the 1.9ML/ha/year is an average annual maximum target or a peak annual value.

- ***Recommendation 1A*:** Revise runoff limit to a higher value, or provide appropriate scientific justification for the given limit.
- ***Recommendation 1B*:** Provide developers' the option of paying a voluntary stormwater quantity offset contribution to appropriately fund stormwater harvesting infrastructure (or similar flow reduction strategies) external to the site.
- ***Recommendation 1C:*** Clarify whether target is an average annual target or peak annual value (if an annual target is to be applied).

- **Item 2 – FRCIWM Strategy 13 Assessment of stormwater volume reduction for WSUD elements:** This table provides predicted volume reductions for WSUD elements across the DCP area – anticipated to be based solely on predictive modelling (e.g. MUSIC). These values are also anticipated to be have been the basis of target stormwater runoff limits for the DCP area and what is considered to be 'practical' and/ or cost-effective. Based on our preliminary review, however, the assumptions applied for these WSUD elements are incorrect and likely to significantly over-estimate the actual or likely stormwater runoff reductions for these WSUD elements – and subsequently contribute to an impractical runoff limit for the DCP area. For example:
  - Potential wetlands (minimum of 8% of the development footprint) have an assumed extended detention depth of 10 days. This is significantly higher than the typically recommended value of between 2 and 3 days, and will likely result in plant die-off within the wetlands (and associated reduced stormwater treatment, amenity and ecology values) due to extended inundation.
  - Cited irrigation rates from open water and wetlands are "0.7 ML/ha/yr or 2.3 ML/d", which are very high and likely excessive – and may not be suitable given cited salinity issues within the DCP area. For example, Blacktown City Council (2020)[3] recommends a value of 0.4ML/ha/year.

  Recommendation 2A: Review applied assumptions in Table 13.

[3] Blacktown City Council, 2020, *MUSIC modelling and WSUD developer handbook*, https://www.blacktown.nsw.gov.au/Plan-build/Stage-2-plans-and-guidelines/Developers-toolkit-for-water-sensitive-urban-design-WSUD/MUSIC-modelling-and-WSUD-developer-handbook

Recommendation 2B: Consider revising stormwater runoff limit in lieu of results from implementing recommendation 2A.

- **Item 3 – Stormwater reuse v treated wastewater usage:** Stormwater harvesting and reuse will most likely be essential to achieve the given runoff target. However, the use of stormwater will 'compete' with (or otherwise limit opportunities for) the use of treated wastewater. Page 27 of the DCP states that "any stormwater harvesting approaches will need to be consistent with a regional wastewater approach and the precinct water balance", however it is unclear how this will be achieved given proposed approaches (and associated cost-effectiveness) to utilise treated wastewater are unknown – noting that page 27 of the FRCIWCMS states "Detailed planning is being carried out on the servicing concepts and networks that would deliver recycled water to Mamre Road and to determine the integration of stormwater recycling and recycled effluent."
    - ***Recommendation 3A*:** Clarify the regional wastewater approach (and associated cost-effectiveness), and how this may limit the reuse of stormwater harvesting and reuse.
    - ***Recommendation 3A:*** Consider revising stormwater runoff limit in lieu of results from implementing recommendation 3A.
- **Item 4 – Stormwater asset evaluation, monitoring and management:** The cited targets appear to be design targets, with compliance anticipated to be 'demonstrated' via conceptual predictive modelling software, with requirements regarding how objectives will actually be achieved. As widely recognised, the ability of any stormwater treatment strategy (and associated assets) to function as intended and achieve given targets is highly dependent on the appropriate management/ maintenance of the asset.
    - ***Recommendation 4*:** Include the following requirement "*Appropriate evaluation, monitoring and maintenance of stormwater control measures (and associated reporting of their condition) must be undertaken to augment their design stormwater treatment function*".
- **Item 5 – Development perviousness target:** Page 27 of the DCP states that "Applicants should target 35% pervious surfaces within lots and streets". This would be an unusually high amount of perviousness for industrial developments, and we question its appropriateness. In particular, it is anticipated that the reduced development density/ imperviousness will likely simply increase the total extent of development. Perhaps a better approach would be limit the extent of development allowed within the DCP area by, for example, increasing the extent of the watercourse buffer areas (which will no doubt have a range of benefits to the area and downstream waterways, and associated ecological values). It is, however, noted that this is not a mandatory requirement.
    - ***Recommendation 5*:** Consider revising recommended target for perviousness cited on page 27 of DCP.
- **Item 6 – DCP Table 6:** The indicators/ parameters given in Table 6 are water quality objectives/ indicators and not waterway health values, as outlined by the table heading.
    - ***Recommendation 6*:** Remove reference to 'waterway health values' in Table 6 heading of DCP and text above table.
- **Item 7 – Salinity:** Page 30 of the DCP states that "All stormwater treatment measures, including infiltration, stormwater harvesting, and reuse will need to demonstrate that they do not increase existing urban salinity or result in increased salt loads in waterways, wetlands drainage lines or soils." The DCP provides no advice as to how this should or can be done, or whether this is even a potential issue – particularly given stormwater flows typically have very low salinity levels (akin to rain water).

- ***Recommendation 7*:** Remove need to demonstrate compliance with aforementioned requirement, or provide clarification as to how to demonstrate compliance.

- **Item 8 – Wianamatta Street Trees:** Page 30 and 31 of the DCP refers to the need for Wianamatta Street Trees, specifically stating "Wianamatta Street Trees are to be incorporated into the local road network and designed in accordance with Figure 7. This design includes extended detention (either above tree or within tree sump/pit) of 0.6 m^3/tree with pits to include subsurface gravel trenches, lined with waterproof membranes to minimise soil reactivity. All water is to be pre-screened with 200 micron mesh to maximise longevity." Figure 7 (on page 31) also provides an example section drawing. We have several concerns in relation to this requirement, including (but not limited to) the following:
    - The cited design configuration is very prescriptive and will significantly reduce innovation and the ability to implement more appropriate (and more cost effective) biofiltration street tree and/ or 'garden bed'-type configurations. High-flow rate biofiltration systems, for example, are likely to be more suitable given their reduced area requirement and demonstrated performance, relative to conventional (sandy loam) biofiltration systems whose performance is 'variable'[4] with high rates of systems in a 'poor' or 'very poor' condition and requiring significant rectification works[5].
    - The requirement of all water to be "pre-screened with a 200-micron mesh" is potentially excessive and not cost-effective. An alternative will likely be the use (and replacement, approximately annually) of an appropriate (e.g. double-shredded hardwood) mulch on the filter media surface to mitigate surface 'blinding' and maximise longevity.
    - Related to the above, there are more appropriate (and less expensive) inlet configurations for streetscape biofiltration systems
    - The use of a liner to "minimise soil reactivity" is likely excessive (as is the use of a geotextile layer in addition to a liner). The appropriateness of a liner is also questionable in areas where exfiltration is suitable and likely to be beneficial.

  ***Recommendation 8*:** Remove specific requirement for "Wianamatta Street Trees" (and allow alternative biofiltration configurations), and/ or liaise with Ocean Protect staff to develop a more effective and appropriate biofiltration configuration.

- **Item 9 – Reliance on biofiltration systems and wetlands:** As indicated in the FRCIWCMS (and associated DCP), there is a strong reliance on the appropriate function (anticipated to be predicted by MUSIC) of conventional bioretention systems and wetlands. As outlined above (and described by the Victoria Environment Protection Agency (2020)[4] and Dalrymple et al (2018)[5]), the ability of conventional bioretention systems and wetlands to remove stormwater pollutant concentrations (particularly nutrients) is variable. We would subsequently question the appropriateness of relying on these assets to ensure the protection of waterways and downstream of the DCP area.
    - ***Recommendation 9A*:** Require any proposed stormwater treatment asset to have appropriate 'real world' performance testing (ideally for local conditions) undertaken to demonstrate that pollutant concentration (and load) reduction rates have been achieved.

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[4] Victoria Environment Protection Agency, 2020. *Publication 1829: Background information: Draft urban stormwater management guidance consultation guide*, https://www.epa.vic.gov.au/about-epa/publications/1739

[5] Dalrymple, B, Coathup C, Coathup J, Penhallurick B, 2018, *Point break for the WSUD Asset Wave*, Ozwater, Melbourne, Victoria, Australia.

- ***Recommendation 9B:*** As previously recommended, include the following requirement "*Appropriate evaluation, monitoring and maintenance of stormwater control measures (and associated reporting of their condition) must be undertaken to augment their design stormwater treatment function*".

- **Item 10 – Table 7 pollutant load removal targets:** It is unclear if given pollutant load targets include any water (and associated pollutant loads) "lost" due to harvesting and/ or exfiltration from WSUD assets.
  - ***Recommendation 10***: Clarify if given targets includes any water (and associated pollutant loads) "lost" due to harvesting and/ or exfiltration from WSUD assets.

- **Item 11 – "Misting" of stormwater:** Page 24 of the FRCIWCMS states that "Water sources would be high quality where there is a risk of human contact and ingestion, but stormwater from ground surfaces could be utilised to mist rooftops for building". It is anticipated that "misting" of roof-tops may pose an unacceptable risk to human health due to contamination of stormwater and subsequent ingestion of stormwater 'mist' by humans.
  - ***Recommendation 11***: Consider removing recommendation for "misting of roof-tops" with stormwater, or require appropriate risk management to demonstrate no significant risk to human health.

- **Item 12 – Exfiltration of stormwater:** It is unclear where exfiltration of stormwater from WSUD assets is recommended or not. Page 50 of the FRCIWCMS states that "Salinity risks mapping of the region shows that over irrigation and concentrated infiltration of stormwater may result in urban salinity impacts", but it is unclear if this applies to the entire DCP area or parts of it – noting that exfiltration from WSUD assets is shown to occur in the given "Parkland approach" (see Figure 7-5 and Table 10 of FRCIWCMS).
  - ***Recommendation 12***: Clarify recommendations regarding exfiltration from WSUD elements.

I trust this is suitable for your current purposes. Please contact me if you have any questions or would like to discuss anything further.

Yours faithfully,

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