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Ms Samantha Mitchell
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Date:	23 September 2022	Contact name:	Andrew Morris
Your reference:	Cherrybrook SSP Response to Submissions	Telephone:	+61 428 134 199
Our reference:	PA2459-RHD-ZZ-XX-CO-Z-0001	Email:	andrew.morris@rhdhv.com
Classification:	Confidential		

Dear Samantha,

Cherrybrook Station State Signifnicant Precinct
Draft Rezoning Proposal
Response to THSC Submission – Stormwater Matters

I refer to your e-mail dated 8th September 2022. The email included a letter from The Hills Shire Council (THSC) which was provided in response to the exhibition of '*Draft Cherrybrook Station Precinct Place Strategy, Draft Rezoning Application*' and supporting documents. Under the section of THSC response titled '*2. Draft Rezoning Application'* Council raised two matters related to stormwater, which are as follows:

- '*The design intent of the detention basin to service the entire SSP requires clarification. At present, a detention basin is co-located with a raingarden that services the Cherrybrook Metro Station. Developable Government Land (DGL) would require enlargement of at least two-fold. The draft Place Strategy rather indicates a preference for a pond that requires the basin to hold water permanently, and this would require a larger basin footprint and an alternate design approach if the pond continues to provide detention and treatment of stormwater from the SSP.'*
- *It is noted that the detention basin is located upstream of residential properties and local roads (SSP land) and the sudden failure of the basin's embankment may prove catastrophic to residents and motorists. There is a greater risk if the basin is further enlarged to function as a lake with spare detention storage. A dam-break analysis would need to be undertaken to determine the extent, depth, and speed of flows in the event of the basins' total collapse/failure. However, this would be contingent on the potential need for a regional detention system for the Green Village (within The Hills).*

Please find below our response to the matters raised by THSC. In preparing this response, we have considered and reviewed a number of documents prepared in support of the rezoning application, including:

- The '*Concept Stormwater Management and Preliminary Flood Risk Assessment'* Report prepared by Royal HaskoningDHV (RHDHV) (April 2022)
- The *'Urban Design Study*' prepared by SJB, specifically Section 11.7 '*Water management and sustainable urban drainage*' (May 2022).
- A Draft '*Proposed Site Specific Development Control Plan (Design Guide)*' prepared by Ethos Urban (May 2022).

1 Size, Configuration and Performance of proposed On-site Stormwater Detention Basin

The *Urban Design Study* (SJB) outlines the objectives for water management and sustainable urban drainage practices on the site which are focussed on maximising the usage of the existing basin for storage. While this is the overall objective, achieving this outcome while complying with the relevant stormwater controls that apply to the site may require additional storage provisions, as envisaged in the Stormwater Management Report prepared by RHDHV. These additional provisions may include the provision of tanks within future high density development, the provision of sub-surface storage near the water body or other related measures.

The overall approach related to stormwater management was to provide a clear objective for the outcome, as outlined in the Urban Design Study, while maintaining flexibility within the configuration of the measures, which would be determined through a future development application process. It is expected that design development that occurs through the development application process would evaluate the volume of detention storage that can be provided via an augmentation of the existing stormwater basin, and what if any additional storage is required to achieve the relevant planning requirements as they relate to stormwater management. The future basin design would be supported by detailed modelling and analysis of the available footprint and consideration of any loss of storage due to the maintenance of a permanent water storage.

Although the submission indicates that the proposed basin would need to provide at least double the storage, the analysis undertaken by RHDHV indicates this would be contingent on the overall site development and the current estimate storage requirement would be slightly less than double the current storage volume. Regardless, these details are expected to be confirmed through the future approval process.

It is noted that the basin and its catchment are located within the current boundary of the Hornsby Shire Local Government Area and so would be designed with reference to relevant controls of that Council along with Development Control Plans specific to the Cherrybrook Precinct.

2 Dam Failure Consequences Associated with the Proposed Basin Upgrade

In response to the matters raised relating to potential dam failure of the future basin upgrade, the following observations are provided:

- Construction of dams within existing urban settings requires careful consideration of the potential risk and consequence of failure of the embankment. This is generally determined through the design development process of any basin.
- The actual consequences associated with dam failure are contingent on the size, configuration, height and type of the dam structure, as well as the nature of the downstream topography and the inhabitants.

- Dam Safety NSW (DSNSW), main role is “to ensure the safety of all declared dams in NSW”. DSNSW also has a system in place for ensuring the potential impact associated with any new dams is properly evaluated, beginning early in the design process. In this regard, it is expected that DSNSW would consult with the consent authority to ensure that appropriate controls and analysis of the proposed dam are considered prior to the approval being granted. It is also expected that in line with this process, DSNSW would be consulted early on in the design to confirm its requirements for the augmentation of the existing basin.
- The nature of the specific risk associated with augmentation of the existing detention basin at the Cherrybrook Station precinct is expected to be considered as part of the future development application process. It is anticipated that through this process, the incremental change in any risk associated with failure of the storage would be evaluated by the consent authority with reference to DSNSW’s guidelines (and consultation if required). In the event that the risk is not deemed to be acceptable, there is flexibility within the planning approach to stormwater to revise the design to mitigate the risk to a level that is acceptable to the consent authority, with advice as necessary from DSNSW.
- As the dam discharges to a tributary that is contained within Hornsby Shire Council and Castle Hill Road represents both the watershed and the LGA boundary, it is not clear how a basin within the “Green Village” development would have any affect on dambreak considerations for the Cherrybrook Station basin.

I trust this letter provides an adequate response to the matters raised by THSC submission to the draft Rezoning Proposal for the Cherrybrook Basin Precinct. Please don’t hesitate to contact me should you have any further questions.

Andrew Morris

Senior Civil & Water Resources Engineer
Water & Maritime