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Daniel Prince
Infrastructure and Capital Works Manager
Crown Melbourne Limited

Dear Daniel

Barangaroo Stage 1C - Crown Hotel Development Remedial Action Plan, Crown Hotel Development (Part of ORWN Area), Barangaroo South – Response to DPI Water Submission

AECOM was commissioned by Crown Sydney Property Pty Limited (Crown) to prepare this letter in response to the following submission comment from the Department of Primary Industries (DPI) Water received in relation to the State Significant Development Application (SSDA) 6957-15:

> *The DPI water recommends the proponent needs to clarify details of the calculations of the ongoing seepage through the basement wall and describe the fresh and saline groundwater fluxes at the site.*

In response to a request for clarification, further detail was provided by the DPI Water as follows:

> *Thank for your email of 30 September. I've discussed your email with our hydrogeologist. The DPI Water's issue is that the number given is for the whole basement wall and it doesn't separate the fluxes in terms of the freshwater coming in from up gradient and the saline water coming in from the harbour. The freshwater has a potential to be contaminated whereas the saline water has the potential to be deleterious to the construction. Further details of each will help with the understanding of the future situation.*

AECOM provides the following response:

- The calculations of the on-going seepage through the basement, whether it be groundwater / freshwater (potentially contaminated) coming in from up gradient or saline water coming in from the Harbour, is based on the strict performance based specification prepared by Crown for the Stage 1C basement. This specification requires that groundwater ingress does not exceed 0.75 l/min across the entire basement wall upon completion of the structure. This is equivalent to the requirement that ingress shall not exceed 1KL per day (24 hours x 60 minutes x 0.75 l/min = 1080 L / day). This criterion was set based on the practical and achievable outcomes of the contractors experience during the construction of the basement in Stage 1A.
- An objective of the *Crown Hotel Development Remedial Action Plan (RAP)* (AECOM, 2015) prepared in relation to the Stage 1C site is that groundwater that might come into contact with the basement perimeter wall does not contain contamination that would represent an unacceptable risk to occupants of the basement. The acceptable concentrations of contaminants on which the *Crown Hotel Development RAP* (AECOM, 2015) is based were determined by a human health risk assessment.
- Fresh and saline groundwater fluxes on the site were considered in *Groundwater Discharge Study* (AECOM, 2010). The objective of the *Groundwater Discharge Study* was to support development of the *VMP/Block 4 RAP* (AECOM, 2013) prepared for the Declaration Site (which is located east of the Stage 1C site) and to estimate likely attenuation factors for contaminant mass flux due to the mixing of seawater prior to discharge. The report concluded:
  - the total inundation of sea water occurs within a 10 m wide tidal prism located immediately behind the caisson wall (located directly adjacent to the Harbour) during incoming and outgoing tides; and
  - that of the total flux towards the Harbour in any given ebb tide, only 10% represented fresh groundwater.
- The performance based specification prepared by Crown for the Stage 1C basement includes a requirement that the design of the basement wall be resistant to the potentially deleterious effects of saline water.

We trust that the above adequately responds to the DPI Water submission. Please call either of the undersigned if you require any additional information.

Yours sincerely

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