



OUT16/15284

Ms Michele Nettlefold
NSW Department of Planning and Environment
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SYDNEY NSW 2001

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Dear Ms Nettlefold

**Stage 1B Basement, Barangaroo South (SSD 6960)
Comment on the Environmental Impact Statement**

I refer to your letter/email dated 9 March 2016 to the Department of Primary Industries in respect to the above matter. Comment has been sought from DPI Water, Fisheries, Agriculture and Lands. DPI Response is as below. Any further referrals to DPI can be sent by email to landuse.enquiries@dpi.nsw.gov.au

Comment by DPI Water

DPI Water has reviewed the Environmental Impact Statement (EIS) and provides the following comments below and detailed comments in **Attachment A**.

DPI Water notes the proposed project is likely to interact with and influence the host groundwater source generally located along its eastern boundary. The following recommendations will assist with making the development compliant with the legislation and assist the on-going management of the groundwater source.

- (1) The Proponent should consider allowing for the continuing discharge of groundwater derived from the Sydney Basin Central Groundwater Source to Darling Harbour; and how mounding, if consequential to the construction, will be prevented or otherwise managed.
- (2) If groundwater is not to be permanently redirected around the construction then, a Groundwater Monitoring and Management Plan (GMMP) should be developed. The GMMP should specify and detail:
 - (a) permanent groundwater monitoring points to be established to assist in managing any future mounding;
 - (b) the development of a suitable management protocol and detail of response actions in case of adverse outcomes
- (3) The Proponent will need to apply for a Temporary Construction Dewatering Licence from DPI Water before dewatering commences.

- (4) The Proponent should be advised that, if there is an on-going take of groundwater from the Sydney Basin Central Groundwater Source following construction, then they will need to quantify this amount and obtain a Water Access Licence for the groundwater source.

For further information please contact Janne Grose, Water Regulation Officer, Parramatta, (02) 8838 7505, janne.grose@dpi.nsw.gov.au.

Yours sincerely



Mitchell Isaacs
Director, Planning Policy & Assessment Advice
8/4/2016

Attachment A
Stage 1B Basement Barangaroo South (SSD 6960)
Comment on Environmental Impact Statement

DPI Water has reviewed the Environmental Impact Statement (EIS) and provides the following comments:

The site has been well characterised geotechnically and hydrogeologically. The site has been subject to intensive sub-surface investigation, and relevant understandings are now also benefitting from construction experience on related nearby sites. A large number of issues - most of which will affect the subject site in some way – have been identified, and include:

- extensive contamination of groundwater, soils, and rock by former gasworks;
- removal of former infrastructure;
- the presence of, and need to remove, large amounts of inhomogeneous fill;
- the presence of soft, marine sediments saturated with sea- and brackish water;
- a stepped, soft sandstone, bedrock profile;
- a significant, weathered dyke which works as a major groundwater conduit;
- the risk of subsidence effects during excavation and dewatering with respect to infrastructure services;
- tidal influence on the groundwater system.

The site will host groundwater seepage over much of the proposed excavation perimeter and floor. Dewatering in conjunction with construction will be essential and is estimated at about 11 L/s (or 87 ML in 3 months). The dewatered groundwater will include contaminated water, free groundwater, saline and brackish waters.

GDEs are not considered to be affected by the proposed construction. GDEs have not been identified in connection with the Barangaroo developments.

The SEARs – especially # 7– “Soil and Water” have been largely addressed by the EIS or other documentation. The Proponent draws heavily on cross-referencing to the requirements for SSD 5897. Largely the matters have been considered and discussed, except for a complete analysis of potential impacts on the groundwater source and aquifer system, discussed below:

(1) Groundwater Source Implications

The site is on a part of the western edge of the Sydney Basin Central Groundwater Source, immediately on and above its discharge zone into Darling Harbour. The construction will affect the flow within, and discharge of, the aquifer system. The construction of the major groundwater cut-off/basement wall will have the propensity to:

- impede flow and alter aquifer characteristics and operation
- create mounding of otherwise free discharge
- alter (flatten) the groundwater gradient in the local district.

The alterations to the groundwater system are somewhat unpredictable because the up-gradient area is subject to considerable development likely to have controlled drainage to basements, alteration to existing flow regimes because of development and services infrastructure, and loss of recharge areas. The developmental area is also large with complex sub-surface conditions as known, and consequently effects may be delayed or transferred along or above the site.

This issue should be addressed by providing for continuing groundwater discharge either beneath or in or around the construction.

(2) On-going Groundwater Take

The basement/groundwater cut-off wall is designed to significantly reduce any on-going groundwater ingress. However, the construction is not designed as a fully-tanked basement. It should be expected that there will be some seepage in and around the wall and floor; some of this may be saline from Darling Harbour.

It is difficult to quantify on-going seepage. For the situation where any seepage is fresh groundwater, and should this be a significant amount, then perpetual licensing of the on-going groundwater take will be required.

(3) Temporary Construction Dewatering Licence

The Proponent's consultants suggest that at least 17 ML of groundwater will be contained in the excavated materials in this project and up to 11 L/s (equivalent to 87 ML over 3 months) seepage will occur into the site during construction: with possibly an additional 3.5 L/s dewatering allowance also to be provided for. This matter needs further clarification.

End Attachment A