

Sara Roach - Bega Valley Hospital - Stage 2

From: <greg.paine@industry.nsw.gov.au>
To: <sara.roach@planning.nsw.gov.au>
Date: 4/17/2013 9:33 AM
Subject: Bega Valley Hospital - Stage 2

Sara,

Advices of NSW Office of Water below.

Will follow under formal DPI letterhead shortly.

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1. Groundwater

The proposed loop heat exchange system is deemed to be an **aquifer interference activity** under the *Water Management Act 2000*. That is, an activity involving any of the following: (a) the penetration of an aquifer; (b) the interference with water in an aquifer; (c) the obstruction of the flow of water in an aquifer; (d) the taking of water from an aquifer in the course of carrying out mining, or any other activity prescribed by the regulations; or (e) the disposal of water taken from an aquifer as referred to in paragraph (d).

The proposed heat loop exchange system works are likely to constitute an aquifer interference activity as a result of the penetration and possible obstruction and interference aspects of the installation.

Relevantly, an **aquifer** is defined under the *Water Management Act 2000* as "a geological structure or formation, or an artificial landfill, that is permeated with water or is capable of being permeated with water". That definition does not specifically exclude low permeability units or fractured rocks and therefore triggers the aquifer interference clauses.

In lieu of the commencement of aquifer interference approvals, a licence under Part 5 of the *Water Act 1912* is required to regulate the activity. On the basis of the information provided, it is considered that such an authorisation is warranted. Further to this, the proponent will be required to hold sufficient licensed water entitlement within the relevant water source for groundwater interception and/or dewatering that may be required prior to commencement of the activity.

As the proposed heat exchange system is a deemed aquifer interference activity, all provisions of the NSW Aquifer Interference Policy apply to that component of the project. It is therefore expected that the installation activities and operation of the scheme will be conducted in accordance with the provisions of the Aquifer Interference Policy, available at <http://www.water.nsw.gov.au/Water-management/Law-and-policy/Key-policies/Aquifer-interference>.

It is apparent from recent studies by the Nebraska Grout Task Force that the integrity of grout used in constructed loop heat exchange systems may be suspect. That is, there may be significant opportunity for the contamination of the subsurface from additives used in the heat exchange solution through construction-induced fractures in the casing and in the grout or bentonite seal. In this regard, the geological consultant for the project (Coffey Geotechnics Pty Ltd) has identified a need for initial and ongoing periodic pressure testing of the system to identify the potential for solution leakage, as well as for purpose-built groundwater monitoring bores to identify any effects on groundwater quality.

A licence under Part 5 of the *Water Act 1912* will be required to authorise the construction and operation of the closed loop heat exchange system. Conditions will be placed on that licence that relate to construction of the bores and the ongoing monitoring and reporting of the system to demonstrate that it is not generating adverse impacts on any groundwater system. These are likely to include:

- geophysical logging of open (for additional strata information) and cased bores (to demonstrate casing and seal integrity).
- predictive modelling of thermal impacts on the subsurface for each seasonal circumstance and for all likely operational scenarios.
- inclusion of monitoring pipes within the host boreholes to provide the ability to demonstrate the ongoing integrity of grout seals.
- a testing program identifying the ongoing operational pressure testing of the system to demonstrate casing integrity.
- purpose-built monitoring bore installations external to the host boreholes at agreed locations to demonstrate that any impacts are isolated from the Bega-Brogo Alluvial Groundwater Source.
- a groundwater monitoring plan detailing agreed schedules, analytical suites and reporting arrangements.

2. Riparian Land

The Flora and Fauna Assessment report (Appendix N) indicates the closest mapped watercourse is located outside Lot 1, 30 – 40 metres north of the planned access road (page 24). Section 8.4 of Appendix N suggests that if the watercourse is within 40 metres of any activity such as the construction of a road, it is likely that revegetation along the watercourse with indigenous plant species will be required (page 32). The Staging Plan in Appendix E shows the new road (Hospital Drive) is located outside the site boundary and forms part of the State Significant Development (SSD) for Stage 1.

The Environmental Impact Statement includes a mitigation measure that *any works within 40 m of the watercourse north of the proposed access road require a Controlled Activities Approval from the NSW Office of Water* (see Table 7, page 69).

The Flora and Fauna Assessment report recommends an enquiry be made with the Office of Water to determine if a Controlled Activity Approval is required (page 35). Consultants for the project have also contacted the Office of Water to confirm whether a Controlled Activities Approval is required.

The Bega Valley Health Services Development project is a State Significant Development, and in accordance with s.89J(1) of the *Environmental Planning and Assessment Act* an activity approval under s. 91 of the *Water Management Act 2000* (WM Act) does not apply. While State Significant Development is excluded from the need for a Controlled Activities Approval, if works are proposed near a 'river' as defined under the WM Act, it is recommended a vegetated riparian corridor is established either side of the watercourse to improve bed and bank stability, water quality and the downstream receiving environment, etc.

The drainage line to the north of the development is not considered a 'river' as defined in the WM Act. A vegetated riparian corridor is therefore not required to be established along the drainage line to the north of the new access road. It is however to be noted that it is a drainage corridor receiving runoff from the upstream Glen Mia subdivision and should be managed to protect the stability and filtering provided by the existing grassed waterway/drainage line.

3. Stormwater detention basins

The Environmental Impact Statement includes a mitigation measure that the on-site detention systems are proposed to detain storm flows to ensure peak storm flows do not exceed that of the existing site for storm events up to and including a 1 in 2 year storm event, but it does not address why the 1 in 2 year storm event and not a larger event has been selected as the design storm event.

The Office of Water previously requested further justification for the selection of this detention size with respect to downstream quantity impacts in terms of flow velocity and duration. The Office of Water requested the project demonstrate the quantity of water that is discharged from the site will not degrade the downstream watercourse

or wetlands and adversely alter the hydrology of the wetlands.

It is recommended the project demonstrates the discharge structures for the proposed stormwater detention systems are capable of dealing with flow velocities to minimise impacts on the hydrologic, hydraulic and geomorphic functions of the downstream environment. It is important discharge velocities mimic natural flows and do not initiate erosion in the downstream environment. These design objectives are outlined in further detail in NSW Office of Water's Guidelines for controlled Activities on Waterfront Land, which can be accessed at: <http://www.water.nsw.gov.au/Water-Licensing/Approvals/Controlled-activities/default.aspx>.

4. Flood Report

The Flood Report (Appendix R) indicates it is essential that the flood levels are confirmed when a comprehensive flood study of the Bega River is undertaken (page 4). It is noted the flood risk across the site varies significantly and once flooding in the river exceeds the main channel capacity, inundation of the site will occur to varying degrees (page 4). It is unclear when the comprehensive flood study is proposed to be prepared and hence the scale of impact both on-site and off-site and potential mitigating requirements has not been considered. It is recommended a comprehensive flood assessment be undertaken to clearly identify the impacts and enable consideration of measures to minimise potential impacts of the development on hydrologic, hydraulic and geomorphic functions.

5. Recommended Condition of Approval

1. A licence under Part 5 of the *Water Act 1912* is to be obtained from the NSW Office of Water for the heat exchange system, and the purpose built monitoring bores necessary to demonstrate the environmental sustainability of the project.

For further information please contact Janne Grose, Planning and Assessment Coordinator (Penrith office) on 4729 8262, or at: Janne.Grose@water.nsw.gov.au.

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