

## MEMORANDUM

COMPANY:	SKM Pty Ltd				
ATTENTION:	██████████				
CC:	██████████, Office of the Coordinator-General; ██████████, Office of the Coordinator-General; ██████████, SunWater; ██████████, Sunwater; ██████████, SKM; ██████████ SKM				
FROM:	██████████				
DATE:	2 November 2012	JOB NO:	B76B	DOC NO:	012a
SUBJECT:	Nathan Dam Springs Drilling Program Observations and Comments				

Dear ██████████

The Springsure Group springs occur in the vicinity of the proposed Nathan Dam and are also referred to as the Boggomoss springs. A review of the site selection for the proposed Springsure Group springs drilling program was conducted to assess the appropriateness of the proposed investigational drilling program, following a request made during the Independent Review GAB Springs Kickoff Meeting.

The following documents on the geology and hydrogeology of the Springsure Group Springs near the proposed Nathan Dam were reviewed or considered:

- EHA, 2008, Nathan Dam Environmental Impact Statement Project: Draft Initial Report—Glebe Weir Review of Environmental Factors; Rpt No GW-08-08-REP-001 Rev A, 19 August 2008
- EHA, 2008, Nathan Dam Environmental Impact Statement Project: Draft Report—Site Inspection Glebe Weir Environs 4-5 November 2008; Rpt No GW-08-08-REP-002 Rev A, 19 November 2008
- Fensham, R.J. and Fairfax, R.J. 2005. Great Artesian Basin Water Resource Plan. Ecological Assessment of GAB springs in Queensland. Report for the Department of Natural Resources and Mines. Queensland Environmental Protection Agency, July 2005. 45pp
- Forbes, V.R. 1968 Taroom, Queensland, Sheet SG/55-8 1:250,000 Geological Series – Explanatory Notes, Bureau of Mineral Resources, Geology and Geophysics
- Hyder Consulting 1997 Impact Assessment Study for Proposed Dawson Dam, October
- Quarantotto, P. 1989 Hydrogeology of the Surat Basin, Queensland, Geological Survey of Queensland Record 1989/26
- Queensland Department of Natural Resources (DNR) 1996 Report on the Impact of Nathan Dam on Boggomosses and Regional Hydrology, Resource Sciences Centre, Resource Condition and Trend Unit, Water Assessment and Planning, November
- Scriven. D. 1995 Report on Groundwater Flow Modelling of the Nathan Dam Site, Queensland Department of Primary Industries – Water Resources, Water resources Division, Groundwater Assessment Group, April

- Scriven, D. 1996 Report on a Groundwater Flow Model for the Modelling of Effects on Boggomosses Near the Nathan Dam Site, Queensland Department of Primary Industries – Water Resources, Water resources Division, Groundwater Assessment Group
- SKM, 2012, Nathan Dam EIS; 23 April 2012  
Whitaker, W.G., Murphy, P.R. and Rollason, R.G. 1974 Geology of the Mundubbera 1:250,000 Sheet Area, Geological Survey of Queensland Report No. 84
- Withnall, I.W., Nieuwenberg, A., Blight, R.L. & YARROL-SCAG Project Teams, 2005: Central Queensland Geoscience Dataset. Geological Survey of Queensland, Department of Natural Resources and Mines, digital data released on CD-ROM.

These documents were also considered to help identify whether the proposed springs work program will yield sufficient data to develop a more complete understanding of how the proposed dam could impact the Boggomoss springs.

The springs investigations conducted in the 1990's identified approximately 70 Boggomoss springs in the Nathan Dam area (DNR, 1996). Subsequent work has increased the number of known and registered Boggomoss springs to approximately 100 (SKM 2012). The DNR identified the following five spring clusters:

- Price Creek Group
- Boggomoss Creek Group
- Upper Cockatoo Group
- Palm Tree Creek Group
- Gorge Creek Group

Geological conditions at the spring sites and hydrogeochemistry from the springs suggest that all of the spring groups, except the Palm Tree Creek Group, are hosted in the Precipice Sandstone aquifer, and occur in the eastern section of the proposed dam area where the Precipice Sandstone is exposed or at a shallow depth below the surface cover. The Palm Tree Creek Group springs are considered to be hosted in the Hutton Sandstone aquifer occurring west of the proposed dam and impoundment where the younger Hutton Sandstone strata occur at the surface or at a shallow depth below the surface cover.

SKM proposes to drill and complete up to five groundwater monitoring clusters located:


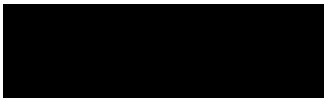
- Downstream of the proposed dam near Price Creek
- North of the inundation area on Boggomoss Creek (2 sites)
- South of the inundation area at Cockatoo Creek
- Between the impoundment tail and the Taroom Township near the Palm Tree group springs.

SMK proposes to complete one shallow bore in the near surface materials and one deeper bore in the aquifer thought to be supplying the springs that surround the selected drill sites. SKM propose to undertake a geochemical and isotope sampling program at these sites, which is a suitable approach and with suitable analytes to obtain information on water levels, chemistry and groundwater ages to develop a

more complete understanding of the groundwater systems that support the springs. The information obtained should thus be suitable for the assessment of potential impacts due to the dam.

SKM has chosen to install the monitoring bores cluster in locations that have a nearly direct relationship with the DNR (1996) groupings, which is a sound design to build on previous investigations and understanding. Compiling information from two sites at the Boggomoss springs is justified given the number and aerial extent of these springs. No sites are proposed for the Gorge Creek Group springs because these springs are located in the Precipice Sandstone outcrop area where the groundwater discharges directly to the streams downstream of the dam and where aquifer conditions locally vary between confined and unconfined. The exclusion of the Gorge Creek Group springs is warranted, in that they are located outside the springs impact investigation area as established by SunWater, the dam proponent.

Yours sincerely,  
RPS Aquaterra



Senior Hydrogeologist