



Monday, 27 September 2021

The Secretary
Planning & Assessment – Compliance
Department of Planning, Industry and Environment
PO Box 3145
Singleton NSW 2330

Attention: Ms Ann Hagerthy

SUBJECT: Cabbage Tree Road Sand Quarry (SSD-6125) – Schedule 2, Condition 11 /12

Dear Ann

I refer to Schedule 2, Condition 11 and 12 of SSD 6125 regarding the Maximum Extraction Depth Report. Condition 12 requires this consent to be reviewed and updated in consultation with DPIE Water and Hunter Water every two years from the date of approval of the Maximum Extraction Depth Report (MED Report) or if groundwater is encountered. The MED report was approved in May 2019. Groundwater levels are currently near the highest recorded onsite, but have remained over 0.75m below the maximum predicted level in the MED Report (i.e. over 1.45m below the maximum extraction depth). Our Annual Reviews in effect provide a review of the levels in the MED Report against the extraction floor.

Unfortunately, due to an oversight (assuming it was two years from commencement), this review is yet to be completed. Adding to the difficulty in delivery of the review as required under the consent is the high demand for specialists in the current environment, with the original endorsed consultant Will Minchin at Watershed HydroGeo being unavailable to complete the required review until January 2022 at the earliest. However, we have been able to engage, subject to Secretary endorsement, Mr Andrew Fulton of Groundwater Exploration Services. Andrew will work with input from Will Minchin where needed. We have enclosed Andrew's resume and respectfully request that he is endorsed to undertake the review and update. We expect this review can be completed within 4-6 weeks following endorsement excluding consultation requirements.

Yours Sincerely

A handwritten signature in black ink, appearing to read "Jonathan Berry", written over a light blue horizontal line.

Jonathan Berry
Principal Advisor
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Encl. Andrew Fulton CV

Curriculum Vitae

Andrew Fulton

PERSONAL DETAILS

Name: Andrew Fulton

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Coogee
NSW 2034

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Career Summary

Andrew is a Hydrogeologist / Geologist with twenty years' experience in a variety of geological and hydrogeological projects ranging from groundwater impact assessments, design and management of groundwater supply, mine dewatering / aquifer depressurisation, and general water management studies.

Having previously worked for the large engineering consultancies where significant experience has been gained in managing complex, multi-disciplinary water resource investigations. Andrew combines experience in hydrogeology, and geology and is familiar with multiple aspects of water resource evaluation, impact assessment and control.

This includes practical aspects such as designing and implementing monitoring programs, managing exploration and groundwater supply drilling projects, installation of production bores and borehole pumping tests, through to evaluation of environmental impacts using numerical modelling assessment techniques.

Andrew has also gained extensive experience in industrial minerals associated with Salt Lake complexes. This includes mineral exploration project program design and supervision, due diligence assessments and associated JORC compliant reporting of minerals resources.

Areas of Experience

His key skills include:

- Hydrogeological assessments and groundwater supply.
- Impacts assessments for mining developments.
- Bore / bore field and groundwater supply systems design.
- Mine dewatering and aquifer depressurisation for open cut and underground operations.
- Construction dewatering.
- Instrumentation installation.
- Compliance monitoring.
- Geological and Hydrogeological data management.
- Project Management.
- Groundwater Modelling.

Formal Education

- BSc (Geology); Auckland University, 1993
- Certificate Geothermal Engineering; Geothermal Institute, Auckland University, 1994
- MSc (Hydrogeology); UTS Sydney, 2001.

Affiliations

Member International Association of Hydrogeologist.
Member Australian Institute of Geoscientists

Career Details

Groundwater Exploration Services 2011 - Present

Andrew established this groundwater consultancy in 2011 offering principal level services in water resource assessment and management. Since starting GES, Andrew has continued involvement in the mining sector, being involved in many groundwater projects primarily relating to project approval for large open cut and underground mines and also assisting with ongoing compliance requirements for numerous mining operations. Andrew has also continued to be involved in groundwater numerical modeling projects for the purpose of impact assessments.

In recent years, Andrew has also been involved in the evaluation of salt lakes, exploring and developing Salt Lake lithium and potassium (SOP and MOP) including lithium projects at Kachi, Cauchari and Rincon salars in Northern Argentina and Lake Mackay potash project in central Australia. Experience includes due diligence, exploration program design and JORC compliant reporting of minerals projects.

Aquaterra 2008 - 2011

Senior Hydrogeologist

Andrew joined Aquaterra in 2008, taking an opportunity to return to a position which focused primarily on mining projects. As a Senior Hydrogeologist, he has been involved in a number of groundwater projects primarily relating to project approval for large open cut and underground mining projects and also for smaller scale quarry operations. This has involved the assessment of hydrogeological systems, the understanding of the potential impacts from project development through analytical methods and numerical groundwater modelling and knowledge of the regulatory framework and constraints. Other roles have included aiding existing mining operations to fulfil mine approval conditional requirements which have included development of annual environmental management reports and groundwater management plans. Coal projects, new and existing, where recent work has been undertaken include:

- Bloomfield Coal Mine
- Moolarben Coal Project
- Narrabri Coal Project
- Tasman Coal Mine
- Abel Coal Mine
- Ashton Coal Mine
- Wambo Coal Mine
- Pinedale Coal Project
- Rix's Creek Mine
- Oyi Tolgoi Copper Gold Project Mongolia

Andrew has been involved in numerous groundwater modelling studies in support of Environmental Impact Assessments for coal projects operations in NSW have included multi-seam proposals, project extensions and new mine approvals. Some of these include:

- Ashton Multi seam assessment
- Ashton - multiple SMP applications
- Narrabri Stage 1
- Narrabri Stage 2
- Wambo
- Moolarben
- Donaldson

Groundwater assessments for quarry operations in NSW and Victoria have included:

- Green Valley Sand Quarry.
- Calga Sand Quarry.
- Leongatha Basalt Quarry
- Holcim Salt Ash Sand Operations

Coffey Geotechnics 2006 - 2008

Senior Hydrogeologist

Andrew joined Coffey Geotechnics in mid-2006 following a move to Sydney where he was exposed to a wide range of civil infrastructure and mining related projects which included:

- Groundwater assessment, groundwater modelling and water balance studies for a feasibility study for the proposed reopening of Woodlawn Nickel Mine near Tarago in New South Wales.

- Groundwater impact assessment study for Crighton Properties relating to a development project on the NSW central coast including groundwater modelling for the proposed 230ha site which included development of a groundwater model.
- Provided groundwater model review of mine groundwater inflow assessments for Belmont Coal Project.
- Groundwater modelling of Sydney basin associated for the Sydney Catchment Authority associated with NSW Metropolitan Water Plan.
- This period also incorporated an overseas assignment which include installation of groundwater supply bores to support mine facilities associated with Kaltim Prima's mining activities in Bengalon, Kalimantan, Indonesia.

GHD 2001 - 2006

Hydrogeologist / Senior Hydrogeologist

Andrew was located in the Latrobe Valley of Victoria for much of his time at GHD within the brown coal mining industry. This included providing support to a geotechnical stability program and lead to management of the aquifer depressurisation program at Loy Yang Mine. The role associated with Loy Yang Mine included coordination of operational and capital budgets for aquifer depressurisation and groundwater monitoring programs, management of project teams, co-ordination of the drilling program for depressurisation and monitoring bores within the mine and regional surrounds. The role included both management of day to day issues and strategic planning for future aquifer depressurisation requirements of a multi-aquifer system.

Project responsibilities included:

- Planning, design and management of mine aquifer depressurisation system, including design of pump bore and observation bore network.
- Management of monitoring databases which included database development.
- Design of pump bores, including assessment of sand gradings, selection of gravel pack and screen aperture, selection of casing materials based on bore depth and water quality.
- Design of observation bores, including standpipe installations and multi-instrument vibrating wire piezometers
- Supervision of bore inspection strategies for failed bore sites, comprising calliper and/or camera inspections of bores
- Assessment of aquifer depressurisation requirements based on future excavation plans.
- Development of mine scale and sub-regional models numerical groundwater models in order to provide predictive aquifer drawdown responses to mining related groundwater extraction.

In addition to the primary role within the brown coal mines of the Latrobe Valley, Andrew was also involved in a black coal resource assessment near the northern Bangladeshi of Phulbari. This involved hydrogeological and mine dewatering assessment for feasibility and environmental assessment purposes. The work included preparation and supervision of installation and pump testing of high yielding production bores, data analysis and development of a regional groundwater model. At times, Andrew was also responsible for supervision of an ongoing coal resource definition drilling program for the proposed large open pit coal mine at Phulbari.

Plutonic Resources - 1998 to 1999

Underground Mine Production Geologist Darlot Gold Mine WA

The discovery of the Centenary ore body provided the opportunity for a move to underground operations where focus shifted to delineation and development of this world-class gold deposit. During mine development, a central role also included operational grade control. A summary of tasks undertaken includes;

- Grade control.
- Design and supervision of surface and underground diamond drilling program.
- Geological interpretation.
- Underground diamond drilling / directional drilling supervision.
- Mine mapping of drives, backs and rises.
- Underground Geological 3D Block Modelling (Vulcan, Surpac software).
- Qualitative geotechnical mapping & reporting of ground stability.
- Strongly involved with OH&S planning and procedures.

Plutonic Resources - 1997 to 1998
Exploration Geologist / Project Geologist
Darlot Gold Mine WA

Exploration geologist within the West Australian gold fields which included drilling programs within a mine lease and regional areas.

Tasks included;

- Geological and geophysical interpretation.
- Diamond core and RC logging.
- Drill rig supervision
- Strongly involved with OH&S planning and procedures.
- Planning of exploration drilling programs.

Environment Waikato, Hamilton NZ- 1996
Graduate Hydrogeologist

A regional government position involved in the formulation of policy following the implementation of the Environmental Resources Management Act, a legislative initiative that placed responsibility for resource development, mining and resulting environmental impacts on regional regulatory authorities. The area of interest centered on existing and planned development of the geothermal resources of the central North Island, NZ.