

Fingerboards Mineral Sands Project

Inquiry and Advisory Committee

SUPPLEMENTARY Expert Witness Statement of Hugh MIDDLEMIS (Groundwater Expert)

5th February 2021

Hugh Middlemis, Principal Groundwater Engineer, HydroGeoLogic Pty Ltd, PO Box 383, Highgate, 5063, South Australia.

1. Introduction

- 1.1. This statement is supplementary to my expert witness statement on groundwater matters that is dated 28th January 2021.
- 1.2. I have been instructed by White and Case on behalf of Kalbar Operations Pty Ltd (Kalbar) to prepare a supplementary expert witness statement relevant to my groundwater expertise in relation to the centrifuge proposal documented in Technical Note TN 01 dated 18 January 2021 and titled "Implementation of centrifuges for water recovery and tailings management".

2. Summary of issues relating to centrifuge proposal and my opinions.

- 2.1. The EES Groundwater Assessment (EMM 2020, presented as Appendix B to EES Appendix A006) was based on an assumption of 80% recovery of water from the fine tails slurry. However the Technical Note 01 indicates that a recovery of 83% is now expected due to the centrifuge process. This reduces the borefield make-up water requirement from 3 GL/year to 2.9 GL/year. It also improves the confidence/reliability of the water balance and make-up estimate as it involves a controlled mechanical process that is not affected by weather, evaporation rates or slurry tailings deposition methods.
- 2.2. There are no material implications for my Groundwater Peer Review (EES Attachment I), nor for my expert statement of 28th January 2021, in that there are no material implications for the Groundwater Assessment (EMM 2020; Appendix B to EES Appendix A006), noting that:
 - 2.2.1. the Groundwater Assessment assumed a borefield make-up requirement of 3 GL/year for 3 years and an option for the full 15 years of mining, along with a Mitchell River winterfill extraction of 3 GL/year (see also item 5e) of my expert statement regarding Mitchell River extraction), which effectively covers the revised water balance volumes;
 - 2.2.2. there is no change to the 80-90% water recovery estimate from the coarse sand tailings and thus there is no change to the related seepage estimates from the coarse tailings that forms a key element of the groundwater modelling assessment;
 - 2.2.3. there is no change to the assumption of effective water entrainment within the fine tailings and thus no seepage from the fine tailings, which is now certain due to the centrifuge treatment and consequent effective entrainment of water within the fines centrifuge cake product that will now form 7-8% of the total backfill volume;
 - 2.2.4. TN 01 indicates that the fines centrifuge cake will be placed as backfill with the overburden in the mine void, ensuring an even dispersal of the fines throughout the backfill profile, which would not involve any potential for low permeability lenses within the mine void backfill and hence no potential for perched water table lenses in the backfilled mine void (see also items 5c) and 5d) of my expert statement).

3. **Declaration**

- 3.1. I have made all the inquiries that I believe are desirable and appropriate and no matters of significance which I regard as relevant have to my knowledge been withheld from the Fingerboards Inquiry and Advisory Committee.



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Signed (Hugh Middlemis)

Date: 5th February 2021