

Otago Regional Council  
70 Stafford Street  
Private Bag 1954  
Dunedin 9054

Attention: Elyse Neville

Dear Elyse

### **Deepdell North Stage III Project Section 92 Requests for Additional Information**

Otago Regional Council (ORC) has engaged Tonkin & Taylor Ltd (T+T) to undertake a review of geotechnical and airblast vibration reports which have been prepared and submitted by others as part of the resource consent application for the proposed Deepdell North Stage III project. The purpose of our review is to assist ORC in assessment of engineering aspects of the resource consent application for this project. This work has been undertaken in accordance with the agreement between ORC and T+T dated 17 December 2019<sup>1</sup>.

The following documents have been reviewed by T+T:

- 1 Report, *Macraes Gold Project, Deepdell East Waste Rock Stack Design Report*, by Engineering Geology Ltd, 8 November 2019 (97 pages),
- 2 Report, *RE: Geotechnical review of updated Deepdell Stage 3 Pit*, by Pells Sullivan Meynink (PSM Consult PTY Ltd); 5 June 2019 (12 pages excluding appendices),
- 3 Report, *Environmental Update, May 2019, Mining Airblast Assessment – Deepdell North Stage III Project, Macraes New Zealand with revised WRS*, by techNick Consulting P/L Consulting Explosives Engineers, 24 May 2019.

Following our initial review of the above reports we have identified various information gaps and uncertainties where we believe that additional information is required in order for us to complete our review. These information gaps and uncertainties are summarised in Table 1 below. We request that ORC arrange for the Applicant to respond to these matters in accordance with Section 92 of the Resource Management Act (RMA).

We also note that previous reviews have included reports covering matters such as groundwater and erosion and sediment control. We understand that review of these matters by T+T is not required at this stage.

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<sup>1</sup> T+T letter, *Review of Engineering Aspects of Resource Consent Application; Deepdell North Stage III Project*, 17 December 2019, Job No: 51640.032.

**Table 1 – Section 92 requests for more information**

Item	Matter to be addressed by the Applicant
<b>Macraes Gold Project, Deepdell East Waste Rock Stack Design Report, by Engineering Geology Ltd</b>	
a	From the volumes discussed in Section 1.0, it appears that the volume of waste rock will exceed that of the proposed waste rock stack (WRS). Please clarify that other appropriate locations have been or will be identified for disposal of the balance of waste rock, and that appropriate consents are in place or will be applied for.
b	Please confirm that the large tension cracks observed in the Deepdell South Pit eastern wall have been appropriately considered in the slope stability analyses. It may be appropriate to undertake a sensitivity analysis considering a significantly reduced cohesion value for the schist.
c	Please clarify when and how the design requirement for shear keys will be reviewed. Will additional test pits be carried out in the vicinity of the potential shear key prior to construction of the WRS?
d	We note that mapped dips are not always in the downslope direction, however, there is variability in both dip and downslope directions across the WRS footprint. Please provide justification for the use of a downslope dip of 15 degrees at Section B-B' (20 degree dip mapped nearby), 10 degrees at Section C-C' (25 degrees mapped nearby) and 0 degrees at Section D-D' (25 degrees mapped nearby). Alternatively, sensitivity analyses could be undertaken to assess the effect of more unfavourable dip/slope combinations which may exist.
<b>Geotechnical review of updated Deepdell Stage 3 Pit, by Pells Sullivan Meynink</b>	
e	The Mohr-Coulomb strength parameters for intact schist are significantly different from those used for assessing stability of the waste rock stack and Deepdell South backfill (by others, Document 1). Please provide some further discussion on the development of the adopted parameters and/or demonstrate that the stability objectives can be achieved with lower strength parameters.
f	Has the potential for block failure (such as planar sliding, wedge failure, and toppling) under seismic conditions been considered? Please provide further information if this has been assessed, or justification if this assessment is not warranted.
g	Further to the above comment, if block failure or bench failure could occur post-closure under seismic conditions, please comment on the potential effects on the pit lake, such as a bench failure large enough to result in a wave overtopping the pit wall.
<b>Environmental Update, May 2019, Mining Airblast Assessment – Deepdell North Stage III Project, Macraes New Zealand with revised WRS, by techNick Consulting</b>	
h	This report refers to a previous report. Please confirm that the previous report referenced is the document titled “ <i>Technical Report, January 2018b, Mining Vibration Assessment – Deepdell North Stage III Project, Macraes New Zealand, dated 30 January 2018</i> ”, and that the mining vibration assessment part of this January 2018 report is still valid for the Deepdell North Stage III project.
i	Subject to comment h above, the vibration formula constant and exponent referenced in the above January 2018 report are the same as that used for the Coronation Pit assessment. Has any monitoring been undertaken for the Coronation Pit project which can be used to verify these parameters?
j	Subject to comment h above, the historical vibration readings from Deepdell North (referenced in the above January 2018 report) are reported in terms of RPPV (mm/s). Please clarify this parameter, i.e. is this raw peak particle velocity, or a root mean square (RMS) value?
k	AS2187.2 – 2006 J7.3 states that “...ground vibration levels can vary from two-fifths to four times that estimated.” Please confirm whether the adopted K factor suitably accounts for this variability, or if the assessment accounts for this variability in another way.
l	Please clarify how the airblast levels presented in the Table in Section 4 of the report have been calculated. The formula and overpressure (kPa) levels presented appear to correspond to higher airblast levels.

Please do not hesitate to contact us if you wish to discuss any aspect of these matters further. In the first instance please refer correspondence to Scott Sutherland, 03 363 2468.

This letter has been prepared on behalf of, and for the exclusive use of, Otago Regional Council, and is subject to, and issued in accordance with, the provisions of the contract between T+T and the Otago Regional Council. T+T accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this letter by any third party.

Tonkin & Taylor Ltd

Environmental and Engineering Consultants

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23-Jan-20

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