



11 June 2019

MEMO: SUPPLEMENTARY NOISE ASSESSMENT

TO: Simon Hedley, Lands and Survey
PROJECT REF: 640001

SOL QUARRIES LTD NOISE ASSESSMENT ADDENDUM

1. This Assessment Addendum provides an update on the previous Noise Assessment (dated 13 February 2019). It provides a supplementary assessment addressing operational changes and issues raised by Environment Canterbury Regional Council (ECan) and Christchurch City Council (CCC). In particular, the matters are as follows:
 - *The AEE states that there will be two mobile crushing units on site. Please provide details of the closest position the crusher will be located to the site boundaries. In addition, the noise report has not clearly indicated where the crusher is proposed to be located when the predicted noise levels were calculated. Please include these details within the Noise Report.*
 - *In addition, the noise assessment needs to measure/quantify and assess the effects of heavy vehicle traffic on nearby dwellings, especially those on the corner of Guys and Ryans Road, which experience breaking and accelerating from trucks turning the corner. Although the traffic numbers per day are not proposed to increase, the proposal, if granted, would now allow for up to a 20-year timeframe. So, the noise levels from trucks still needs to be considered as part of this application.*
2. Since the initial assessment, SOL Quarries Ltd has decided, for operational reasons, to implement a 350-metre setback from the north-eastern and south-eastern site boundary related to crushing of gravel, stockpiling of processed aggregate or pit-run and loading trucks. SOL Quarries Ltd has advised that these activities will not take place within the area defined in Figure 1, below. The aforementioned activities will be limited to an area setback 350-metres from the north-eastern and south-eastern site boundaries. The only proposed activities to take place within 350-metres of this north-eastern and south eastern setback are:
 - Stripping soil;
 - Excavation of gravels;
 - Clean fill; and
 - Site rehabilitation.
3. The initial operational phase noise model (13 February 2019) did not considered the 350-metre setback, as the setback had not been defined at the time. Rather, the initial model calculated the entire final footprint of the proposed Quarry extension as a basis for

modelling the noise effects of all the quarry activities. The Operational Noise Dispersion model has been updated (refer to Attachment 1) to provide for the setback changes.

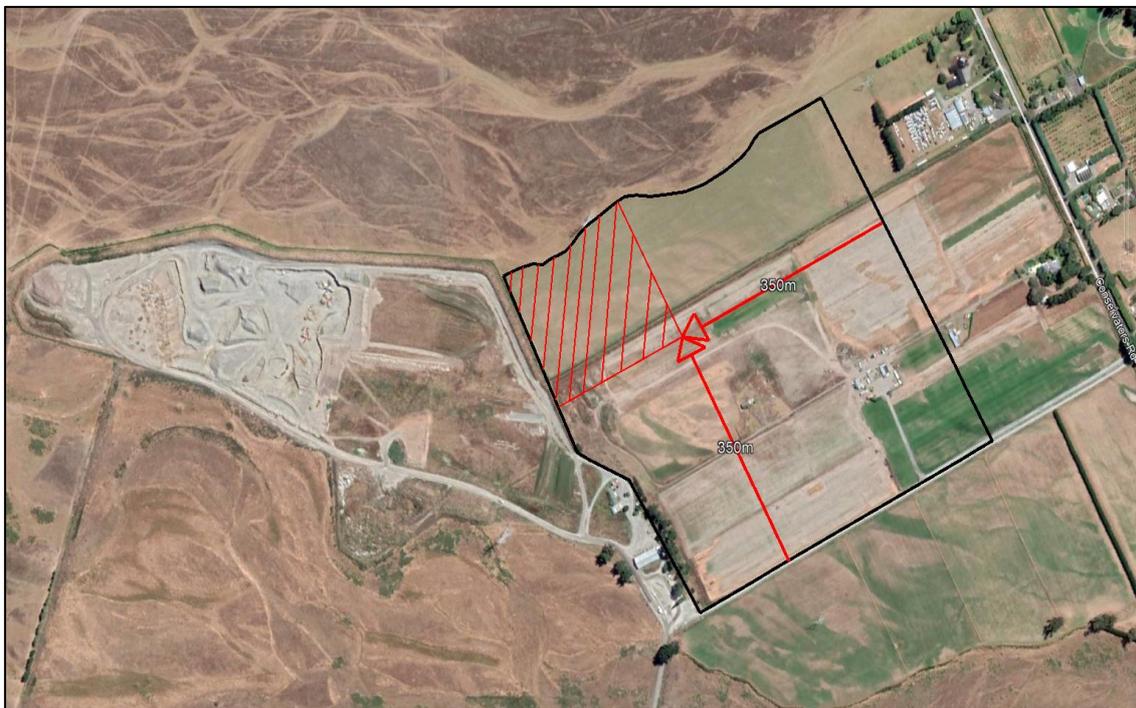


Figure 1: Boundary setback of crushing plant (350-metres from north-eastern and south eastern adjoining properties)

4. The updated modelling results indicate that the quarrying activities will comply with the Christchurch District Plan Noise Limits at the notional and property boundaries of the sensitive receptors along Conservators Road. The dispersion models indicate that the expected noise levels will range from 40dB L_{Aeq} to 55dB L_{Aeq} within the properties of the relevant receptors along Conservators Road with a maximum level of 48dB L_{Aeq} received at the notional boundaries of the closest dwellings (92, 119 and 133 Conservators Road).
5. The modelling results also indicate that there is slight exceedance (1dB L_{Aeq} at most) at the Harewood Gravels Ltd property boundary (located adjacent south of the SOL Quarries Ltd light vehicle entrance/exit road) with the 55dB L_{Aeq} noise contour extending approximately 10 metres into the property at the southernmost portion of the extension footprint. However, there are no sensitive activities and/or receptors within this relatively small area of influence. Rather, the area is predominately used for pasture and low-density grazing.
6. The predicted daytime L_{Aeq} noise level at the Harewood Gravels dwelling's notional boundary, located approximately 500 metres from the SOL Quarries Ltd extension footprint, is 44dB. Accordingly, the noise effects associated with the proposed SOL Quarries Ltd extension on the Harewood Gravels Ltd property is less than minor.
7. With reference the second issue raised by Council, specifically an assessment of the noise effects of heavy vehicle traffic on nearby dwellings, an additional site visit was undertaken to measure the Sound Exposure Level (L_{AE}) from heavy vehicles travelling to and from SOL Quarries Ltd. The L_{AE} levels, which include the noise effects of the trucks breaking and accelerating, are presented in the Table below.



Measurement no. and location		Comment	L _{AE} level (dB)
1: Roughly 40m east from the Guys Rd/ Ryans Rd intersection along Ryans Rd	 	2 trucks, one driving south on Guys Rd and one turning into Ryans Rd	81
2: At the Guys Rd/ Ryans Rd intersection	 	1 truck turning from Guys Rd into Ryans Rd	82
3: At the Guys Rd/ Ryans Rd intersection	 	1 truck driving down Guys Rd	85



<p>4: At the Guys Rd/ Ryans Rd intersection</p>			<p>WasteCo truck turning into Ryans Rd from Guys Rd</p>	<p>81</p>
<p>5: At the Guys Rd/ Ryans Rd intersection</p>			<p>Smith's truck turning into Ryans Rd from Guys Rd</p>	<p>86</p>
<p>6: At the Guys Rd/ Ryans Rd intersection</p>			<p>Morland truck and trailer turning right from Ryans Rd into Guys Rd (Braking at stop line)</p>	<p>85</p>



<p>7: At the Guys Rd/ Ryans Rd intersection</p>			<p>Smith's truck turning from Ryans Rd into Guys Rd</p>	<p>85</p>
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8. The average measurement (84 dB L_{AE}) was used to calculate a L_{Aeq} (15min) reference level of 63dB at 10 metres, for a truck trip rate of 7 trucks every 15 minutes. The truck trip rate was calculated based on the currently consented 300 truck movements per 11-hour day. This calculation is considered appropriate for the proposed Quarry extension, as SOL Quarries Ltd has confirmed that the proposed Quarry extension will not involve a change to the maximum number of consented truck movements per day.
9. The reference level was used to calculate the likely noise levels experienced at the notional boundaries of dwellings on Guys and Ryans Roads. At these locations, a duration adjustment of -3dBA was applied in accordance with Table 2 of NZS6802:2008 as the noise occurs for 40% to 50% of the time. The duration reduction relates to the restriction on trucks using Guys and Ryans Road when exiting the Quarry (Consent Condition 35 has the effect of prohibiting trucks from turning right out of the heavy goods vehicle entrance/exit onto Guys Road between 7:00am to 9:00am and 4:00pm to 6:00pm). For houses at Savills Road, a duration adjustment of -1dB was applied due to the noise occurring for 60% to 80% of the time.
10. The results indicate that the adjusted L_{Aeq} level is 57 dB L_{Aeq} (15 min) at 10 metres from the edge of the road and at the notional boundaries of houses that are located closest to Guys Road and Ryans Road.
11. At the notional boundary of the house closest to the Guys Road / Ryans Road intersection (located approximately 65 m south of the intersection), a level of 52dB L_{Aeq} is calculated.
12. At the notional boundaries of houses on Savills Road, located approximately 10 metres from the road, an adjusted level of 59 dB L_{Aeq} is calculated.
13. The Harewood Gravels High Court judgement (dated 30 November 2018), which upheld the Environment Court's judgement (dated 10 October 2017), declining the consent issued to Harewood Gravels Ltd, was also considered as the Court decisions related to noise assessments. The most relevant outcome includes the distinction made between rules and effects (especially cumulative effects). The Courts concluded that the Harewood Gravels Ltd proposal would have adverse effects in terms of the predicted cumulative effects of their proposed Heavy Good Vehicle (HGV) traffic and the existing traffic on the relevant roads (i.e. the additional effect associated with the increase in heavy traffic / trucks).
14. It is significant that heavy vehicle traffic associated with the SOL Quarry operations is already a component of the existing ambient soundscape. The L_{Aeq} level from SOL Quarries Ltd's HGV traffic (as confirmed by the results above) is similar to the 'pre-quarrying' baseline of 58dB that is identified in the evidence by Dr Trevathan referred to in the High Court decision (CIV-2017-409-891 [2018] NZHC 3118; paragraph 193). Therefore, it is concluded that the noise effect, during the additional 8 years of operation as part of the Quarry Extension Proposal, will be less than minor.
15. Considering that the number of trucks (300 per day) is the maximum allowed by the current Resource Consent and that the HGV trip rate will differ from time to time, it is expected that by applying an average trip rate to the calculation, SOL Quarries Ltd's contribution to the existing ambient will decrease.



16. Furthermore, the existing SOL Quarry has approximately 6 – 8 years left. During the last 12-months of the existing Quarry life the “enabling works” associated with the Quarry extension will be undertaken and completed. This includes the realignment of the stock water race and the construction of the “bunds”.
17. It is expected that by the time the SOL Quarry extension is operative (7 – 9 years from now) the existing SOL Quarry will be exhausted (there will be a transition as the operation moves from the existing Quarry onto the new Site), the Frews Quarry in Savills Road will be exhausted, infilled and rehabilitated and the Grant Cleanfill Pit (Savills Road) will be infilled and rehabilitated.
18. Accordingly, the cumulative noise levels of the HGV traffic along Savills Road will therefore most likely have decreased by the time SOL Quarries Ltd are operating within the extension footprint.

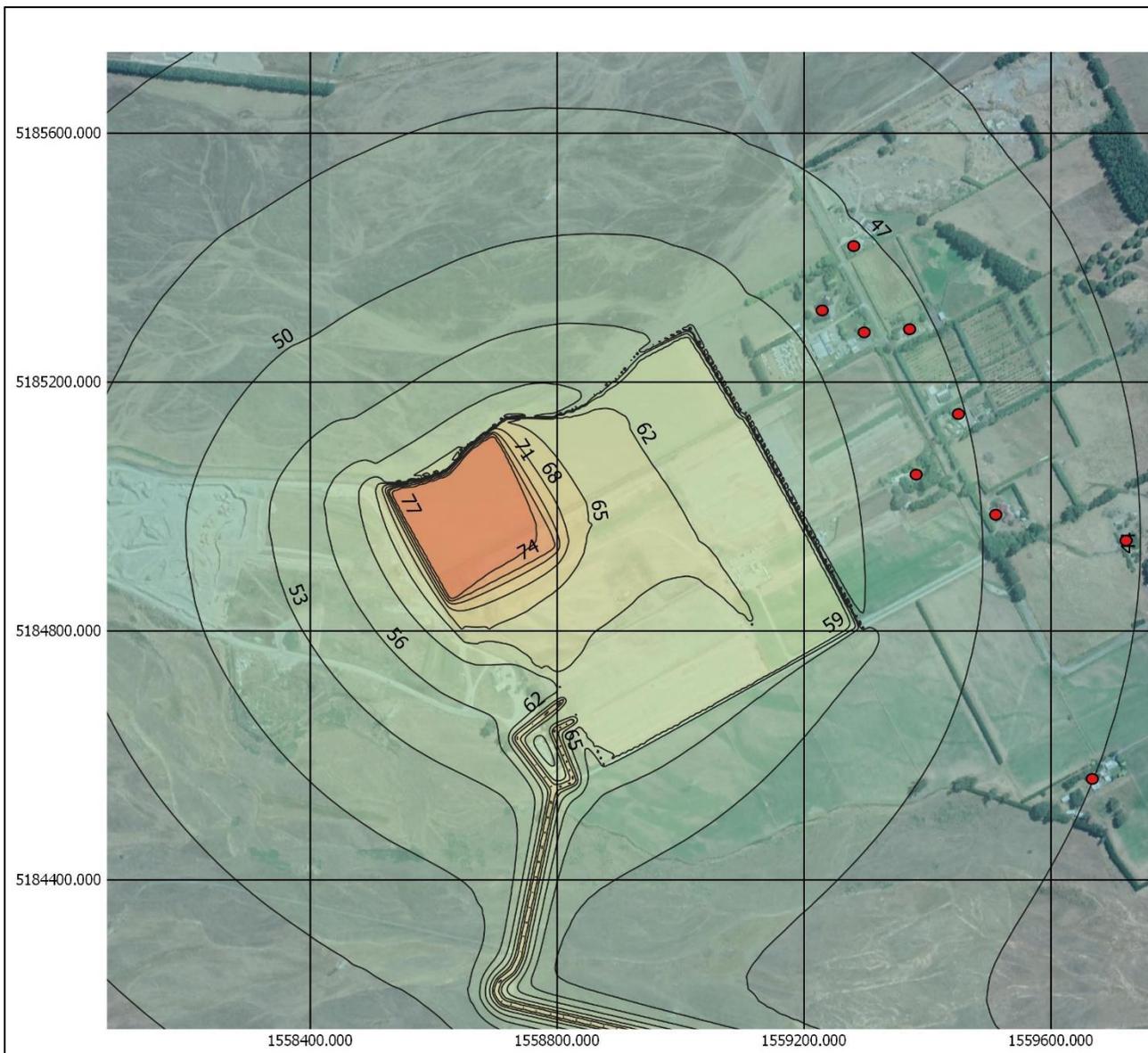
Yours sincerely,

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Attachment 1: Updated Operational Noise Dispersion Model



**SOL Quarries
Phase 2
Extension
Updated Operational
Noise Dispersion
(LAeq)**

Rural Zone Limits
Notional boundary = 50 LAeq
Site boundary = 55 LAeq

● Receptor

