

Memo

Date	1/6/2017
To	Brett Aldridge, Senior Manager Service Delivery
CC	
From	Dr Tim Davie, Chief Scientist

Dust monitoring and silica content calculations

The Science Group at Environment Canterbury has received and reviewed a spreadsheet of dust monitoring data from houses nearby to the Yaldhurst quarries. I understand that this came via Wayne Tewnion and the spreadsheet was developed by Dr Kelvin Duncan.

In the spreadsheet there are calculations to make comparisons between the Yaldhurst measurements with permissible exposure limits (PELs) set out by the Occupational Safety and Health Administration (OSHA). In addition to science staff at ECan reviewing the spreadsheet we have also asked two independent scientists (from NIWA and University of Canterbury) to review it. In light of these reviews I have the following comments to make:

- We have serious doubts about the accuracy of both the instrument used and the sampling regime.
- Setting aside those doubts we have reviewed the calculations which result in apparent exceedance of the permissible exposure limits as set down by OSHA. We conclude that there is a significant error in the calculations.
 - The error involves a confusion between concentration and dose.
 - The measurements taken are concentrations and it is incorrect to multiply these up by the number of seconds in a day. You would do this multiplication if it were a mass measurement and you were calculating cumulative daily dose.
 - Both of the independent scientists confirmed this was an error in the calculations.
- If we were to accept the accuracy of measurement, using the formula provided by OSHA the worst reading comes out at around 20% of the PEL. This was checked and agreed by our external reviewer from NIWA.

While I am comfortable to disregard the spreadsheet calculations and have serious doubts on the measurement technique, I would recommend that we proceed with the planned air quality monitoring programme so that we can obtain high quality data on dust and silica to make comparisons to OSHA and other standards.

