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<tr>
<th>Name</th>
<th>Qualification</th>
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The following information is being submitted in relation to the proposed quarry on the corner of Dawsons and Jones Road Templeton by Fulton Hogan.

**Author of submission:** Gareth Fitch BVetMed MS DACVS

The proposed quarry has a number of equine facilities in close proximity i.e. within 5km. An aerial survey on Google Maps indicates the number of training facilities adjacent to the proposed quarry site represented by training tracks.

The material to be quarried is Greywacke, which contains Quartz and hence silica. It is known that silica is responsible for pneumoconiosis in horses and silicosis in people. The animal model is very similar to the course in human disease. Any silicate crystal can cause silicosis if it gets into the airway and unlike organic material that can be removed by the body silicates remain in the tissues causing and inflammatory reaction and eventually permanent inflammatory changes.

Quartz is of primary concern in industrial activities because of the mechanical pulverization. Mining, cutting concrete, "tuck pointing," and sandblasting are common causes of liberalisation, aerosolization and hence inhalation of silica. Freshly fractured crystals are doubly dangerous; the first reason is that they are made small enough to enter the alveoli; second reason is that freshly fractured crystals have more free radicals, causing more severe disease. This has been shown in human studies and in rats.

Horses are predisposed to inhalation of these particles as they graze pasture with their nose close to pasture contaminated with silica particles. Pneumoconiosis has been documented in horses and as in humans and when advanced is fatal. It has been shown that osteoporosis has been linked to pulmonary silicosis. Osteoporosis could lead to the increase in the incidence of fractures. This could be particularly significant to horses in training, which are already predisposed to stress fractures due to maladaptation to training.

The concern to the horses that are trained in this area is not an increase in the incidence of fulminant disease, but the induction of lower airway inflammation, known as inflammatory airway disease (IAD). Organic material in the environment
i.e. pollen and mould spores are considered responsible for inducing IAD in susceptible individuals. IAD is a performance limiting problem for horses competing at a high level i.e. standardbred and thoroughbred racehorses. These horses exercise reaching the maximum demand for oxygen and inflammatory airway disease can be the difference between winning and finishing last. A trainer needs to have the horses able to compete to the maximum of their ability, the presence of lower airway inflammation is performance limiting and would be the difference between winning or being unplaced. Training is a results-based profession and it is critical that the horses are at peak performance as poor results result in a loss of owners/clients. Increase in the incidence of inflammatory airway disease could be devastating to their livelihood.

Silicates are used in experimental models of recurrent airway obstruction (RAO) as an inducer of inflammatory changes. Based on this finding, it can be considered that the presence of silica dust in conjunction with organic molecules would increase the severity and incidence of IAD.

The dust from the quarry could be distributed within this area contrary to results of the findings in the Yaldhurst as this study was conducted during a period of higher than average rainfall.

Horses are used as a model for human respiratory disease due to the similarities between RAO and human asthma. If there is concern for the effects of quarry dust on horses, there should also be a real concern for the effect of dust on the residents of Templeton. The measure should not be the risk of the development of silicosis, but the increase in incidence of respiratory disease due to airway inflammation, which may not be fatal, but would be very debilitating.

**In summary:** The proximity of the quarry to training facilities would be considered detrimental to the health of the horses and hence have a negative impact on the income of the trainers. Given that horses are a reliable model for human inflammatory airway disease/asthma, the implications for human respiratory health are also valid.

References:


