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**From:** Ian Magee [REDACTED]  
**Sent:** Monday, 3 May 2021 3:09 AM  
**To:** Fingerboards Inquiry and Advisory Committee (DELWP)  
**Cc:** Ian Magee  
**Subject:** Failure by the Consultant SGS and the Proponent to Report the Most Significant Source of Radiation Exposure – the Risk Of Loss Of Life.

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Good Morning Amy,

Thank you for your email response to our phone call of the 28th April.

As indicated the BDEC requests to lodge a pre-hearing document with the IAC.

BDEC has now completed a review of the Radiation Assessment A011 as prepared by the consultant SGS for the proponent.

This review has found that SGS have dramatically under-estimated the radiation loading to which mine workers will likely be exposed.

BDEC therefore request that in the interest of the safety of mine workers and members of the public the following correspondence be placed before the IAC Chair and panel members.

#### OPEN LETTER

Chair and Panel Members,  
Fingerboards IAC,

SGS has failed to identify the two most significant sources of radiation likely to be present on the Fingerboards project. These sources are the stockpile of HMC at the loading dock and a further temporary stockpile of HMC described as waiting contractual arrangements. These stockpiles of HMC are scaled by the proponent as up to 50,000 tonnes ( Reference - Project Description A006. Chapter 3.5.2 ) and 500,000 tonnes( Reference - Draft Work Plan ) respectively.

SGS considered primarily two sources of radiation, that was the ore body itself, and the HMC evaluated as a maximum volume of one cubic metre as exposed at the loading dock. ( Reference A011. 9.1.1 page 36 ). The two stockpiles of HMC described above are several orders of magnitude above the volume of one cubic metre as used in the evaluation by SGS. The radiation loading to mine workers, or members of the public on the mine site, from the HMC stockpiles will then be far greater than the evaluations provided by SGS, that is likely to be in the order of up to several hundred mSv. This level would greatly exceed the accepted legal loadings at a worksite in Victoria, that is 20mSv for mine workers and one mSv for members of the public respectively. It also follows that as these exposed stockpiles of HMC are capable of generating massive dust loads during adverse weather conditions that the exposure to humans or other receptors beyond the mine boundary has not been correctly evaluated by SGS and is now problematic. HMC when dry has little resistance to wind erosion, consisting of fine ( < 200 micron ), medium density particles which are not bound and normally poorly consolidated. Images of HMC stockpiles at current mineral sand mining operations in Australia illustrate the wave patterns typical of wind erosion.

The failure of SGS to identify the HMC stockpiles as the significant sources of radiation may be explained by their incorrect identification of the slimes as the source of the HMC product ( Reference A011 Section 6.2 page 36 ) and

that this would suggest that SGS may not have had access to the draft Work Plan and/or there was a failure by the proponent to brief their consultant.

SGS omitted to describe that the Fingerboards project is novel compared to most mineral sand mining projects in that the proponent intends to export the more significant radioactive component of the ore, monazite, included within the HMC product. Burial in a waste pit within the mine site is the more normal fate for monazite. SGS have provided a radiation loading evaluation for workers engaged with bulk handling of HMC at the Port of Melbourne. Bulk handling of HMC at the Port of Melbourne would not be a permitted activity. These omissions or failures by SGS demonstrate that they have failed to gain an understanding of the mine model.

The radiation assessment conclave report listed as pre-hearing document 234 describes the agreed position of the conclave members, being that HMC is the most significant consideration in establishing the safety of workers on the Fingerboards site.

Page / item 15 states -

“..... The ideal would be for the HMC to be loaded via as closed a system as possible ( eg. a closed conveyor or pipe ) directly in to train-borne containers at or immediately adjacent the mine site, containers are then sealed and transported by rail.“

“ All agreed in principle”.

The proponent would have understood that a closed system, as described, is not possible within their mine model. SGS were present at the conclave meeting held on the 14th of April.

It is reasonable to consider that the peer review members of the conclave, due to the mechanisms of a peer review as established by the IAC, are unlikely to have had viewed the draft Work Plan so would not have identified the HMC stockpiles or considered them as potential sources of significant radiation.

The proponent in a further pre-hearing document, number 243 dated the 16th of April, has changed the draft Work Plan by withdrawing the description of HMC stockpiles and providing a replacement description of HMC stored in silos. It is assumed the addition of these silos is intended to provide radiation shielding to the stored HMC.

These silos add more than 30% to the capital cost of the project and should now be considered as the fourth iteration of the mine model prior to the panel hearing.

It is likely that the use of silos is impractical. HMC is normally discharged hydraulically from the processing plant and is subsequently dewatered to a moisture content of around 5% to be conditioned for shipping. The practical way to achieve this dewatering is to farm the HMC in stockpiles of several hectares open to the atmosphere where it is conditioned over some weeks to achieve the 5% moisture content. In this circumstance the mine workers operating earth moving equipment over a layer of HMC would be exposed to a radiation loading dramatically in excess of the SGS evaluations. The silos would present a totally unacceptable risk to workers entering these enclosed spaces to remove blockages to the flow of HMC as they could be exposed to dangerous accumulations of radon gas.

The BDEC advise that the Air Quality and Greenhouse Gas Assessment ( Reference - A009 ) and the Health Risk Assessment ( Reference - A019 ) are now compromised in that the consultants preparing those assessments were likely unaware that SGS had failed to identify the HMC stockpiles as the most significant source of radiation and additionally that the HMC stockpiles were not evaluated as a source for offsite migration of radioactive dust.

The BDEC is fortunate to have practising or retired Doctors, Engineers and Scientists amongst it's members. The BDEC therefore feels that it is reasonably well informed to place this review, including matters of risk, before the IAC. Information is drawn almost entirely from documents already before the IAC and offered in layman's terms so that it does not require scientific interpretation.

The IAC have multiple pathways available which they can use to validate this information.

If the IAC choose not to validate the information during the period of the hearing it may be that they have failed in their administrative task as an IAC to satisfy the Ministerial Guidelines or the Fingerboards Scoping Requirements. If the project were to proceed and was mis-informed by the SGS Assessment there is a very high probability that mine workers would be exposed to radiation loadings above the permitted level.

It is also possible that if the project were to proceed that, as discussed in the BDEC pre-hearing document 203, if there was catastrophic failure of an ANCOLD category dam or a mine void, and the IAC had failed to require the proponent to provide hydrological modelling that described the flood surge downstream, that the risk of loss of life is not adequately evaluated.

In these two circumstances a Coronial Inquiry or a Criminal Court may find that multiple parties involved with the Fingerboards EES project could be considered for legal culpability in areas such as wilful blindness or criminal

recklessness if they had information placed before them that they should have reasonably examined but failed to do so.

BDEC considers it has an ethical obligation to make those parties who may be associated with Assessments A009, A011 and A019 aware of the failure of the Radiation Assessment to identify the significant risks and as such have prepared this advice as an open letter so that it can as necessary be provided to parties such as the proponent, consultants, regulatory bodies such as Worksafe and DHHS and Ministerial offices as may be necessary.

Lodged with our request for your timely consideration please.

Ian Magee for the BDEC. 