27 October 2015

Our Ref: 20159

Tim Browne (Umwelt)
Jane Barnett (Pacific Environment)

By email

Dear Tim,

RE: Cost-benefit analysis for the Mount Owen Continued Operations Project

The cost-benefit analysis (CBA) for the Mount Owen Continued Operations Project included an estimate of the health costs associated with airborne particulate matter. The CBA was subsequently reviewed by the Centre for International Economics, who identified that PAEHolmes (2013) provided up-to-date estimates of unit damage costs for $PM_{2.5}$ on a per tonne of emission basis. The Centre for International Economics also made a recommendation for

> 'presenting a *range of estimates for air pollution given the uncertainty around the methodology'*.

The PAEHolmes report referred to by the Centre for International Economics presents unit damage cost values (A$ per tonne of $PM_{2.5}$ emitted, at 2011 prices) for 'significant urban areas' (SUAs) in Australia. SUAs are urban centres with more than 10,000 people. It should be understood that the method monetises $PM_{2.5}$ emissions and not $PM_{2.5}$ concentrations which are the key output of air dispersion models used to assess the incremental impacts of a proposed mining project. The method is fundamentally based upon damage cost values from the UK (Defra), with a conversion to reflect differences in the valuation of health outcomes and currency between the UK and Australia. The differentiation between the unit damage costs for SUAs in Australia is a function of population density. In other words, one tonne of $PM_{2.5}$ emissions occurring in a more populated area is associated with higher health costs compared with one tonne of $PM_{2.5}$ emissions occurring in a less populated area. This allows the location of emissions to be linked to an approximate population-weighted exposure to $PM_{2.5}$.

Nevertheless, the damage cost method does have some limitations under certain conditions. Whilst the PAEHolmes report states that the method can be applied in principle to all emission sources, the UK damage cost data underlying the values in the PAEHolmes report relate primarily to the impacts of $PM_{2.5}$ from transport sources, and the distribution of infrastructure and population in the UK. The PAEHolmes report notes that,

> *'Emissions from non-transport sources will lead to a different population-weighted exposure compared with road transport. This is reflected in the Defra damage costs, which assign much lower levels to industry and electricity generation (as these are mostly emitted from tall stacks in rural areas). Population-weighted exposure from industrial stack emissions is not analysed separately in the UK for different areas. Further modelling work would be needed to address this issue accurately (both in the UK and Australia). It is therefore highlighted that the application of the new damage costs to industrial stack emissions will over-estimate population-weighted exposure, and it is recommended that industrial emissions are considered separately where industry dominates an area'*.

Similar limitations would apply to the application of the damage cost method to other large but localised industrial emission sources in areas with small pockets of population, such as the Mount Owen Continued Operations Project. The damage cost methodology is actually meant to be applied to emissions that occur within populated areas. In the case of an emitter such as a coal mine that is located away from population centres, it is reasonable to argue that the approach is inappropriate.

We therefore support the recommendation by the Centre for International Economics that a range of methodologies for calculating the health cost of airborne particulate matter can be used, provided that there is sufficient technical justification for these. In relation to the Mount Owen Continued Operations Project, there are sufficient technical reasons for not using the damage cost method an applying an alternative assessment methodology.

Yours faithfully,

Paul Boulter

Principal Scientist
Pacific Environment
North Sydney