

Attachment 1: Response by the Department of Science Information Technology and Innovation to issues raised in letter of 17 July 2017 from the Yatala Residents Association.

Bio-aerosol investigation

The Department of Science, Information Technology and Innovation (DSITI) and the Department of Environment and Heritage Protection (EHP) engaged an external consultant in 2015 to conduct bio-aerosol monitoring to investigate the community concerns about bio-aerosol impacts on the receiving environment from the Phoenix Power Recyclers (PPR) composting facility located at 126 Sandy Creek Road Yatala.

The monitoring and final report has been completed, however DSITI propose a review of the final report to clarify the concerns raised in the Yatala Residents Association (YRA) letter. DSITI anticipate the reviewed report will be available by the end of August 2017.

Monitoring sites and equipment

The initial dust investigation proposed to monitor at one location known to be impacted by quarry emissions, for a three month period during dry conditions. DSITI later extended the monitoring period to over 12 months and included an additional monitoring site. Whilst not all parameters were able to be measured at both locations over the whole period, DSITI are of the opinion the additional monitoring served to better determine the impacts from quarry emissions.

The monitoring sites and equipment for the Ormeau/Yatala Air Quality Investigation were selected on the basis of the initial scope of the study proposed by EHP, i.e. to investigate potential impacts from quarrying activities, especially community exposure to respirable crystalline silica. As such, monitoring locations were selected in the immediate vicinity of quarries which allowed monitoring of respirable crystalline silica present at both monitoring sites for the full period of monitoring.

DSITI recognises the potential impact on results from dust emissions originating from the industrial estate development but would like to highlight that the monitoring program was not intended to fulfil all the additional requirements mentioned in the YRA letter.

The location of the monitoring equipment was limited by a number of logistical factors which included practical considerations (e.g. optimal compliance with Australian Standard siting criteria, footprint required for monitoring equipment, security, vehicle access, electricity supply, etc) in addition to proximity to the quarries. It was not physically possible to site the monitoring equipment present at the Luscombe location at the Ormeau location.

The chosen locations were considered to be the optimal combination of Australian Standard guidelines, proximity to the quarries, physical footprint and operational requirements.

Monitoring parameters

For assessment of possible health impacts, DSITI considered measurement of PM₁₀ to be the key parameter of concern, as this is the main particle emission source from quarries based on National Pollution Index (NPI) reporting data.

For the 2015/16 reporting year, NPI data indicates that Yatala quarry PM₁₀ emissions were between 17 and 23 times greater than the PM_{2.5} emissions. PM₁₀/PM_{2.5} ratios of this magnitudes means that quarry PM_{2.5} emissions can confidently be assumed to comply with guidelines if PM₁₀ emissions are in compliance. For this reason, where it was not possible to

measure a range of particle fractions (for reasons of equipment availability or site constraints), priority was given to measuring PM₁₀.

It is acknowledged that a longer period of PM₁₀ monitoring at the Ormeau location would have been helpful to assess the dust event reported to EHP in early July, but as this location was not part of the original investigation scope, equipment was not in place at the time of the event. In response to the reported event, PM₁₀ instrumentation (being the key parameter for determining health impacts) was added at this location. Physical constraints prevented the co-location of continuous PM_{2.5} and TSP sampling equipment at the Ormeau site.

Dust deposition

The limitations of the dust deposition sampling method are acknowledged in the report. The dust deposition sampling method was not intended to provide definitive information on short-term contributions from a particular source, but rather served to give an indication of general nuisance dust levels from all sources.

Whilst nuisance arising from sustained/regular offsite dust emissions is likely to be measurable, nuisance associated with high dust levels of relatively short duration during the sampling period are less likely to be identified.

It is generally accepted that particles that settle from the air do not travel significant distances and highest levels will be measured in close proximity to the emissions source. For this reason it is considered highly unlikely that the cumulative deposited dust levels resulting from multiple sources in residential areas would be higher than the levels measured in close proximity to specific dust sources such as a quarry.

General observations

DSITI is not aware of health-based evidence to support the YRA's perception that short-term particle values (e.g. hourly) above a longer-term average (24-hour or annual) value pose a risk to human health. Further advice will be sought from the Department of Health regarding this concern.

The monitoring data indicates that the hypothetical scenario proposed by the YRA, where regular hourly particle concentrations exceed the 24-hour average value, is not representative of ambient conditions. At the Luscombe monitoring site, hourly PM₁₀ concentrations exceeded 50µg/m³ for only 55 out of 10129 hours (0.5%) and hourly PM_{2.5} concentrations exceeded 25µg/m³ for only 5 out of 5875 hours (0.09%). At the Ormeau monitoring site PM₁₀ concentrations exceeded 50µg/m³ for only 34 out of 2784 hours (1.2%).

The assumption drawn by the YRA, that particle exposure in locations impacted by multiple sources is simply the sum of the emissions from the individual sources, does not necessarily consider factors such as meteorology, emission patterns and decreasing concentration with distance from the emission sources due to dilution by cleaner air.

Cumulative particle loads are not necessarily additive in nature, due to factors such as meteorology, emission patterns and decreasing concentration with distance from emission sources.

Asbestos

Asbestos monitoring was conducted under conditions when quarry dust impacts were perceived to be occurring. The fact that no respirable asbestos material was detected under

these conditions indicates that it is highly unlikely that asbestos materials are associated with quarry emissions.

Monitoring by residents was considered the best means of obtaining ambient asbestos samples during periods when quarry dust impacts were perceived to be occurring, as the monitoring sites were not staffed and monitoring at pre-determined times was likely to result in unsuitable meteorological and operating conditions to assess for dust impacts.

The difference in the written sampling instructions provided to residents will not have had an impact on the results. Both sets of instructions required the filter to be held in an upright position (sampling inlet to the top) when capping the inlet. Following this instruction would have ensured no loss of material, whether the pump was on or off at the time the inlet was capped.

The detection limit of the measurement and analysis method (0.001 fibres/mL) is adequate to assess compliance with the workplace exposure standard (used in the absence of an ambient standard).

Whilst the detection limit for asbestos is expressed as a concentration (<0.001 fibres/mL), the analysis method examined the collected material for the actual presence of respirable asbestos fibres. The hypothetical situation concerning asbestos exposure proposed in the YRA letter is theoretically possible but highly unlikely to reflect actual ambient conditions. It is significant that no asbestos fibres were identified in any of the collected samples.

Summary

- The content of the bio-aerosol investigation report will be reviewed in consideration of the issues raised in the YRA letter. It is anticipated that public release will occur by the end of August 2017.
- The purpose of the current monitoring investigation/report was to assess the impact of quarry emissions. It is believed that the monitoring has fulfilled this objective. The monitoring showed that normal quarry operations do not give rise to particle levels in the community that are likely to pose a risk to human health (based on compliance with relevant air quality guidelines). Infrequent exceedances were usually associated with atypical conditions (such as blasting during strong winds blowing towards residential properties).
- Siting of the monitoring equipment was reliant on a number of factors which limited where the monitoring sites could be located. The chosen sites were the optimal combination of Australian Standard guidelines, proximity to the quarries, physical footprint and operational requirements.
- PM₁₀ monitoring is considered an adequate proxy for PM_{2.5} monitoring where PM_{2.5} monitoring was not performed due to the high PM₁₀ to PM_{2.5} ratio in quarry emissions (based on NPI data).
- The deposited dust method is a limited dust nuisance assessment tool. Whilst nuisance arising from sustained/regular offsite dust emissions is likely to be measurable, nuisance associated with high dust levels of relatively short duration during the sampling period are less likely to be identified.
- Asbestos monitoring was conducted under conditions when quarry dust impacts were perceived to be occurring. The fact that no respirable asbestos material was detected under these conditions indicates that it is highly unlikely that asbestos materials are associated with quarry emissions in the Yatala area.

- Cumulative particle loads are not necessarily additive due to factors such as meteorology, emission patterns and decreasing concentration with distance from emission sources.