

## Case Study

### The Challenge.

A large West Australian Gold Mine set out to understand the direct relationship between adding more production equipment and the consequential effect this would have on baseline diesel particulate matter (DPM) levels. Key site personnel including the ventilation manager, production manager and mine manager formed a task group and agreed to develop a project scope, execution plan, results evaluation methodology, and next steps recommendations. A location was chosen based on close (40m Est.) proximity to diesel powered equipment near the working face. This environment was considered high risk due to the activity levels and the predominance of diesel emitting technologies. Ventilation airflow was also regarded as being considerably less in this area of the operation when compared to the average ventilation velocity in the mining operation.

### The solution

Monitoring was proposed to be undertaken to establish a baseline with a world first continuous real-time fixed monitor being the most practical and safest long-term methodology to monitor a group 1 carcinogenic. The monitor was installed in late 2018 and kept insitu for both the baseline setting as well as the next 3 months to monitor the area where 3 new and additional pieces of primary production equipment were being deployed. The task group proposed to monitor the results in the assessment phase directly via live data fed to a control room in the ventilation managers office. Key personnel also wanted full access to this data live 24/7 on smart devices such as mobile phone desktop, laptop, and tablets to account for the week on and week off mine band roster.

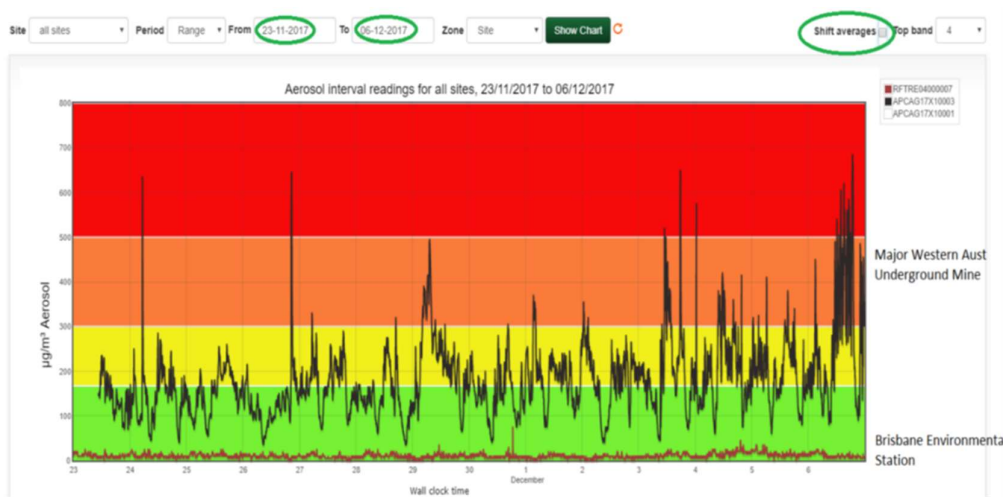
### DPM Monitoring Results

The data was made available in continuous real time, via all the requested forms of smart devices to the mining managers, OH&S managers as well as the ventilation personnel. The Data was able to be displayed in live dynamic view, nominated shift average (12 Hr shifts at this site), as well as in 15 min rolling averages. Site decided the 'shift averaging' view was the most beneficial in establishing and setting the baseline data, which enables DPM trends to be more reflective of the average ambient DPM levels across the working environment. The data was also downloaded into Excel and integrated into the SCADA system.

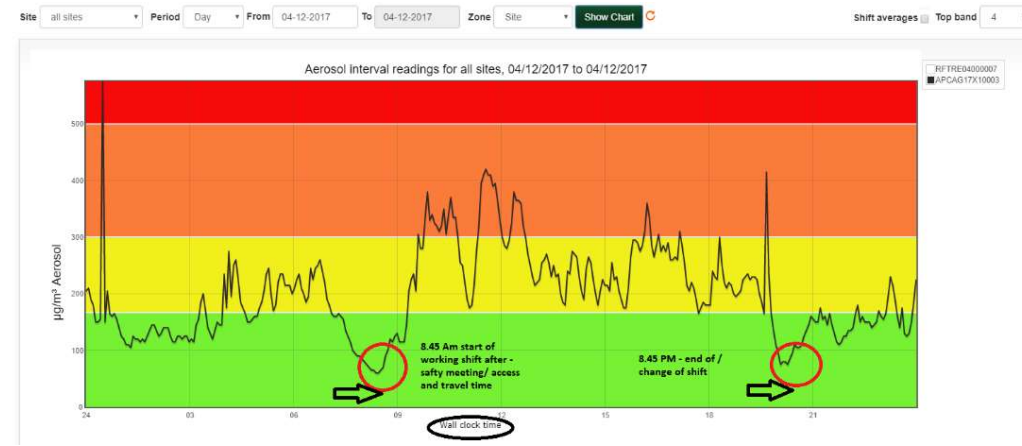
The shift averaging functionality clearly showed a slow but steady increase in Diesel Particulate Matter (DPM) levels over the evaluation period.



Data from customised dashboard - Based on shift averages (Two Week View)



Data from customised dashboard - Based on the 'dynamic view' (Two Week View)



Data from customised dashboard - End of shift' Effect on the DPM levels (One Day View).

The data clearly articulates periods of activity including peak activity during the 12 hr shifts. The data also highlights the effect the 'end of shift' has on the DPM levels near the working face.

Whilst this dilutionary effect is noticeable, it does indicate the ventilation effect in this instance could only be regarded as being moderately effective.

## CONTINUOUS IMPROVEMENT

Site established a dedicated diesel management committee to ensure that the findings would change procedures which resulted in a healthy and safe working environment for the workers within this operation.

This process enabled real-time decisions, ultimately leading to adjustments in engineering controls as a critical path in the operation's journey to move more tonnes safely.

One of the key initiatives was to continue baseline monitoring with a business wide focus on the DPM mitigating controls. The continuous real-time diesel emissions monitoring unit remains a vital component in the operation today and the business has recently purchased more units.