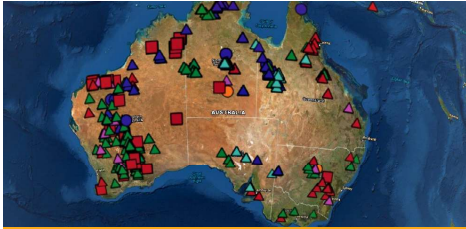


# THE AUSTRALIAN MINING REVIEW

AUG 2021

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# Contents

## News

- 04 COMMODITIES SNAPSHOT
- 06 NEWS

## Mining Lifestyle

- 21 APPRENTICESHIPS ON THE INCREASE
- 22 TRADIE FOR A DAY

## Features

- 23 FOSTERVILLE GOLD MINE
- 26 PILBARA PORTS
- 28 NEW HOPE GROUP
- 34 BULGA COAL

## Industry Focus

- 36 COMPANIES GEARING UP
- 44 CONVEYOR SUPPLIERS
- 54 EMERGENCY SERVICES
- 58 FLEET MANAGEMENT SERVICES
- 59 EARTHMOVERS AND EXCAVATORS
- 62 CRITICAL MINERALS
- 63 HYDRAULIC SOLUTIONS
- 69 BLASTING SERVICES
- 70 WEATHER MONITORING
- 76 DRUGS TESTING SERVICES
- 79 FLOW CONTROL
- 80 WORKING AT HEIGHTS
- 82 MINESITE REHABILITATION
- 84 MOTOR BODY BUILDING

## Technical Talk

- 86 PRE-EMPLOYMENT MEDICALS
- 92 ROCKBREAKING SOLUTIONS
- 94 HYDRAULICS AND PNEUMATICS
- 96 EARTHMOVING
- 98 DIESEL SOLUTIONS
- 106 THERMOGRAPHY SERVICES
- 110 INTERNET SERVICES

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# The Invisible Guardian

> The ruggedised, fixed monitor **Pinssar DPR** system.



According to the Australian Cancer Council, diesel engine exhaust emissions are the second most common cancer-causing agent (carcinogen) affecting workers in this country – only behind ultraviolet radiation exposure.

This therefore makes it the most common cancer-causing agent in the underground working environment.

The Council's research suggests millions of Australian workers are exposed to diesel particulate matter (DPM) every year, increasing their risk of developing health problems, including various cancers and heart attacks.

Australian DPM specialist Pinssar, says that understanding what you are dealing with and how to reliably monitor those emissions can go a long way to protecting millions of Australian workers.

The Pinssar-developed DPM monitoring system is recognised globally as a significant

breakthrough in sampling diesel emission levels in harsh underground environments. This is particularly critical in underground mines which rely on heavy equipment powered by diesel fuel.

Pinssar's system provides a robust and practical solution for managing risks relating to DPM in these environments, with its continuous, real-time monitoring solution. This technology allows miners to work smarter, creating a healthier and more productive mine.

The *Australian Mining Review* recently caught up with Pinssar's Managing Director, Francois Velge, to tap into his internationally respected views about DPM.

"The world of diesel particulates is obviously very topical at the moment with such a focus on air pollutants and the impact on worker's health. For the last few years the spotlight has been on dust but progressive miners and inspectors are also beginning to focus on the other dangerous air-borne

particulate – DPM," Francois said.

"All around the world, Government and Industry are reviewing their existing guidelines which have been acknowledged as too broad. Those guidelines were established with a mix of theory and the technologies available at the time.

"However, those previous technologies are unable to monitor DPM continuously within the dynamic working environment.

"Those previous technologies only take random, point in time samples which generally provides some pieces to the puzzle but never the full picture."

The new technology addresses these shortfalls by providing a picture of the continuously changing underground

environment in real-time. In Australia, the Work Health and Safety Act advises employers that their workplace has to be safe.

In this Act, and in many other parts of the world, they prescribe adhering to 'as low as reasonably practicable' (ALARP) which states the person concerned should reasonably know about the ways of eliminating or minimising the risk.

"By a company only meeting the bare minimum compliance requirements they are not addressing ALARP," Francois said.

"However, the laws are black and white; if they prove you did not do everything you could have to reduce the danger to your employees, you are potentially liable.

"Therefore if there is a technology that will help you minimise risk then you should implement it."

The British Standards have acknowledged that continuous real-time technology is available and accordingly updated the BS6164 in October 2019. "In speaking with various industry contacts, there is an expectation that more and more jurisdictions will follow."

According to Francois, "increasing the awareness of this technology will enable companies to reconsider their current DPM monitoring strategies".

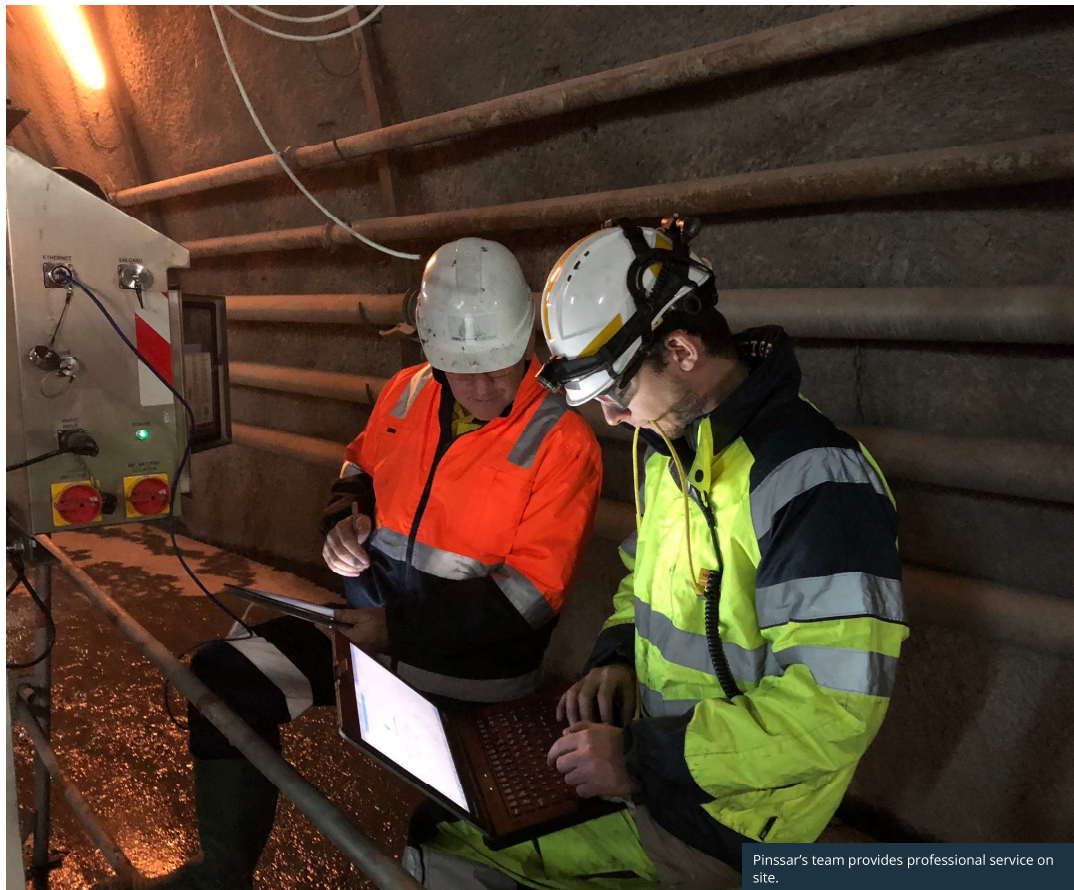
"There is a movement at the top to improve the working environment for the health of employees in the mining sector." - Francois Velge

Some of the largest mining organisations have taken the first steps in developing leading edge health platforms which is a movement away from a compliance only attitude. Francois said that notably the decision by the big companies to work on improving the situation was driven by themselves.

"Senior executives of these progressive companies believe that just doing enough is really not good enough and this is now being incorporated within their health strategies," he said.

"About two to three years ago we commenced on the journey with them, actively looking for a way to continuously measure DPM".

However Francois' journey started much earlier, back in 2013.



Pinssar's team provides professional service on site.



"When we started looking at this issue, we found that there was nobody really specialising in this area," he said.

"We are the only company, to my knowledge, which has designed and developed a solution from the ground up in trying to solve this problem.

"We met with many different operators within the industry and we captured each of their concerns and desires. The one that came out again and again was the need for a low maintenance monitoring system. Something they could virtually set and forget.

"I call it the invisible guardian, it sits quietly in the background, and alerts the relevant people if the environment is changing".

The system will send an email and will create an alert on the dashboard based on the client's pre-defined preferences.

"It was during this early phase that it became evident that this technology could benefit all departments in the mine going from senior management all the way down to the operators themselves," Francois said.

"Although OH&S is responsible for compliance, it is mine management and ventilation engineers that have the statutory obligation to make sure that the right quantity of air is available to dilute DPM".

Furthermore, the guideline requirements are that all vehicles going underground need to be tailpipe tested at least once a quarter.

"The traditional practices of ventilation and fleet management for DPM mitigation have been based on theory and impractical testing," Francois said.

"In reality the level of emissions is not always directly linked to the kilowatts of the engine however this theoretical practice is what the industry has to rely on in the absence of more relevant data".

Another consideration is that most of the tail pipe monitoring currently is happening above ground in controlled conditions.

"So, mostly, when you have a truck or a vehicle working underground under load it is very different to what is happening in the controlled test above ground. The tailpipe test does not represent the underground working environment where exposures occur," Francois said.

The Pinssar system was developed to understand the constantly changing working environment with continuous 24/7 samples in real-time.

This technology now enables the operations to link their mitigating controls with actual data.

Francois says "the spend on DPM mitigation is substantial and to date could not be fully validated. Now with this technology, mine management can have greater confidence that their expenditure is allocated appropriately and supported by data driven decisions".

Furthermore, in a timely manner the Pinssar system can identify potential maintenance issues of DPM mitigating controls.

Examples include detecting compromised exhaust systems, cracked manifolds (which would not have been picked-up through tailpipe testing), or issues with the ventilation system such as doors not being sealed, ripped bags, excessive wear and tear of fan blades, etc.

Additionally it can pick up human errors such as leaving ventilation doors open,

excessive idling, etc.

"That is something I am excited about as we know that the mine now can react very quickly," Francois said.

"Workers can be assured that if the real-time data is trending towards an emissions exposure, the mine can move as quickly as possible to try to resolve the issue.

"With continuous monitoring, you don't have to wait months to find out about an exceedance via the results from personal devices (NIOSH 5040); if you have a problem you know about it and can fix it straight away."

The Pinssar system is not designed to replace those existing technologies, which all have their place - rather the Pinssar system works in conjunction with those technologies to complete the entire DPM emissions picture.

"Currently, across the six continents that the Pinssar solution has been adopted in - that's

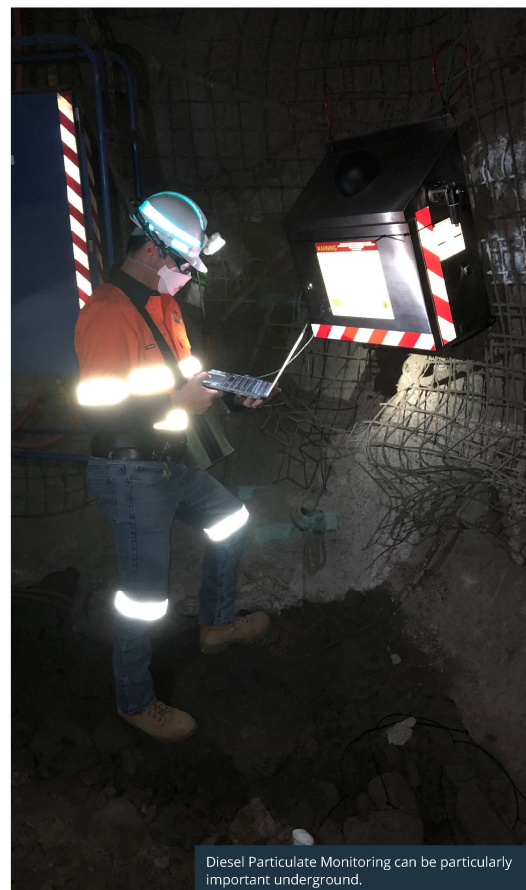
how they use the system.

"Our focus is and will always be, identifying the source of your DPM problem. You can't manage what you don't monitor" And that to me, is the essential thing."

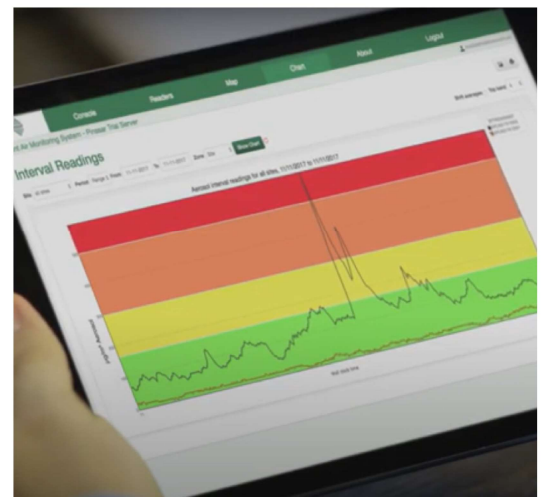
Finally, Francois says employers have a duty of care, and they should be adopting the tools available to ensure their workers are safe and healthy.

"At the end of the day the Pinssar system enables the mine to take control and give their people greater confidence when underground," he said. **AMR**

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