

19/4/21

RE: IPC Submission – Tahmoor South – GHG methane emissions

It is abundantly clear the Longwall mining process is the elephant in the room in terms of methane emissions. In addition, it has always been unclear to me why the significant volumes of methane exhausted to the atmosphere via upcast ventilation shafts, known as ventilation air methane (VAM) is not accounted for and reduction enforced as part of environmental assessments and approvals.

1. Longwall mining deliberately causes fracturing of the strata above (and to a lesser extent below) the coal seam as the strata above collapses into the goaf. All the strata above the coal seam (hundreds of metres above) fractures. Such a process must release far greater quantities of methane than a process which preserves the integrity of the strata with no caving or fracturing.

Bord and pillar processes, similar to the recently approved Russell Vale project are known to produce significantly less methane. Processes such as bord and pillar only release gas from the face being mined – strata above and below remain unaffected.

The following quote from Section 3.1 (p37) of the United Nations “Best Practice Guidance for Effective Methane Drainage and Use in Coal Mines” reinforces the point.

“Longwall mining methods release substantially more gas than partial extraction methods such as room-and-pillar due to the large volume of strata disturbed by the caving process.”

Clause 3.1 p37, https://unece.org/DAM/energy/cmm/docs/BPG_2017.pdf

Recommendation 1

Reject the expansion or if approved exclude longwall mining methods.

2. Underground coal mining, whether by longwall or other process, always releases vast volumes of methane (and other gases) as roadways are constructed and coal is extracted. This makes for a dangerous and potentially explosive workplace. It is for this reason that mine ventilation systems are installed and operated at great cost to the mine proprietor.

So where do all these gases go? In general gases are simply expelled to the atmosphere and I believe, with few environmental compliance controls. Methane is by far the most significant greenhouse gas emitted.

Research indicates the methane emitted from coal mine ventilation systems, VAM, exceeds the volume of methane formally extracted for reuse or flaring.

“Underground mines are by far the largest source of fugitive methane emissions in the coal sector, and it is estimated that 70% or more of all global coal mining related emissions are from underground ventilation air.”

Clause 6.5 p62, https://unece.org/DAM/energy/cmm/docs/BPG_2017.pdf

In addition, and quite apart from VAM there is also an unknown, and admittedly difficult to measure, amount of methane emitted via surface fracturing. The most dramatic release is seen in rivers and creeks where the methane can literally be ignited.

We must account for this methane, and to ensure compliance we must measure and verify the volume of methane expelled by each emitter.

This is a global problem, and hence there are global solutions – satellites. There are a number of satellite-based methane monitoring programs underway. The European Space Agency (ESA) has its Copernicus Sentinel-5P satellite looking for methane emissions. It then deploys “Claire” to home in on specific facilities.

https://www.esa.int/Applications/Observing_the_Earth/Copernicus/Sentinel-5P/New_Space_satellite_pinpoints_industrial_methane_emissions

Could similar technology be of use for Australian compliance monitoring?

Can VAM be reduced? Yes, there are technologies available.

“Generally, it is technically feasible to oxidise VAM at concentrations above 0.20%, and there are several commercial projects now in operation around the world.”

Clause 6.2.1 p58, https://unece.org/DAM/energy/cmm/docs/BPG_2017.pdf

Given it is feasible to monitor and also to reduce VAM, then it stands to reason the IPC should consider conditions to do just that.

Recommendation 2

If the expansion is approved, then

- VAM (and other methane emissions) must be measured and accounted for, and
- technologies to reduce VAM emissions must be employed.

I note (again) that SIMEC intends to halt coal mining operations in approximately ten years as the company (if it still exists, given current financing issues) transitions to green steel.

“However, it should also be acknowledged that the Project is a carefully considered and vital part of the transition to GREENSTEEL production, which SIMEC GFG is actively committed to, to achieve net-zero GHGE from the business by 2030. The life of the Project is relatively short, at around 10 years to 2032, and is consistent with the latest research and anticipated timing of the transition away from coal-based steel production.”

https://www.ipcn.nsw.gov.au/resources/pac/media/files/pac/projects/2020/10/tah-moor-south-coal-project-ssd-8445/correspondence/department/210409-in-applicant-letter-to-dpie-regarding-scope-1-greenhouse-gas-emissions_redacted.pdf

Without wishing to labour the point, it is longwall mining that causes mine subsidence AND it is longwall mining that is the cause of much of the methane problem. A change to bord and pillar solves both problems in the short term whilst green steel solves the problem in the medium to long term.

Your attention to these matters is appreciated.

Regards

Sam Davis

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M: [REDACTED]