**KEY ISSUE 5 SUBMISSION “INRUSH DEFINITION CHANGE”**

**What the evidence establishes about the following matters prior to 6 May 2020, and whether they may have contributed to the occurrence of the serious accident:**

1. **Whether the pre-drainage of gas from seams proximate to the GMS was conducted adequately.**

**FINDING 1**

**There has been an incorrect terminology applied by both the Grosvenor Mine and the Mines Inspectorate since the first Methane Inrush in Development in 2016.**

**They have used the term “Floor Heave” and then regularly state as ‘being accompanied by’ or ‘associated with’ an “uncontrolled methane release”.**

**Methane is a “gas”.**

**RECOMMENDATION 1**

**The CMSHR 2001 Definition of “Inrush” in Schedule 9 be amended to**

**“inrush means an unplanned or uncontrolled flood “or release” of liquid, gas or material that has the potential to create a hazard.”**

**RECOMMENDATION 2**

**Creating a new specific “Methane Inrush Standard Operating Procedure Regulation”**

***COUNSEL ASSISTING MR HUNTER S.C. 9th March 2021 TRA.500.014.0004***

***It is intended now to commence this set of public hearings with an introduction to the evidence that is expected to be heard on these issues. The explosion cannot be understood as an isolated event. As the Board knows, over the relatively short period it was in operation, longwall 104 accumulated 14 methane exceedance HPIs. Those HPIs on longwall 104 were preceded by another 13 on longwall 103 between 2 July and 7 November 2019, and, further, those 13 HPIs on 103 were themselves preceded by multiple similar events on not only longwall 103 but also 102 and 101.***

***Methane exceedance HPIs at this mine had been the subject of repeated discussions between members of the inspectorate and mine management.***

***It is at least arguable that the events of 6 May 2020 were a further manifestation of Anglo's ongoing inability to safely manage methane at Grosvenor. Now, that senior management at Grosvenor knew that there was a problem cannot be doubted.***

**An inrush is defined in Schedule 9 of the CMSHR 2001 as**

**“inrush means an unplanned or uncontrolled flood of liquid, gas or material that has the potential to create a hazard.”**

**When the term “Inrush” is used most Underground Coal Miners and more importantly Management will think of an Inrush of water.**

**Almost certainly, they will first mention the** **1996 Gretley Disaster in NSW with 4 Mine Workers Drowned.**

**The 1994 Moura No 2 Disaster, the 1995 Endeavour Mine (NSW) Explosion and the 2010 Pike River Mine Disaster (NZ) were all subject to extensive Investigation.**

[**http://www.mineaccidents.com.au/mine-accident/49/moura-2-mine-1994**](http://www.mineaccidents.com.au/mine-accident/49/moura-2-mine-1994)

[**http://www.mineaccidents.com.au/uploads/endeavour-explosion-1995.pdf**](http://www.mineaccidents.com.au/uploads/endeavour-explosion-1995.pdf)

[**http://www.mineaccidents.com.au/search/pike%20river**](http://www.mineaccidents.com.au/search/pike%20river)

**Moura No 2 and Pike River resulted in multiple fatalities (11 and 29 respectively) and the permanent sealing of the Mine at the surface the subject of Public Formal Inquiries.**

**None of the 30 mineworkers underground at the time were killed at Endeavour Colliery and the mine resumed operations.**

**An “Inrush” of methane onto/into the working face has resulted in a methane explosion with the resulting tragic multiple fatalities on two out of three occasions. The inrush a result of roof fall in the goaf.**

**Grosvenor Mine has been subject to Methane Inrushes since 2016.**

**The difference between Grosvenor and Moura No 2, Endeavour and Pike River is that Grosvenor Mine Methane Inrushes onto/into the working face is the mechanism and location of the Methane Inrush.**

**Moura, Endeavour and Pike River Methane Inrushes were caused by the displacement forces generated by the roof in the goaf falling. The roof in the goaf is displaced because of its inability to resist the force of gravity.**

**The Grosvenor Methane Inrushes come from the Floor because forces resulting from the gas desorption pressure is greater than the ability of the interburden to contain.**

**FINDING 1**

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**Methane is a “gas”.**

**RECOMMENDATION 1**

**The CMSHR 2001 Definition of “Inrush” in Schedule 9 be amended to**

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**REASONS FOR RECOMMENDATION**

**I shall just be using the term “Methane Inrush” except when quoting the existing Regulations.**

**The Mines Inspectors documentation shows the Grosvenor Mine was subject to obvious and on-going problems; with continual high numbers of Methane HPI’s both in Development and Longwall Operations.**

**The vast majority of the Grosvenor Development HPI’s were from Methane Inrushes from the floor.**

[**https://coalminesinquiry.qld.gov.au/wp-content/uploads/2021/04/LFI-investigation-report-for-serious-accident-06052020.pdf**](https://coalminesinquiry.qld.gov.au/wp-content/uploads/2021/04/LFI-investigation-report-for-serious-accident-06052020.pdf)

**On page 15 of the Grosvenor LFI Report to the Mines Inspectors is a table of LW 104 Methane HPI’s from the 18th of March till the 21st of April 2020. Attachment 1**

**GROSVENOR MINE**

**At one stage Grosvenor Mine Methane HPI’s made up 60% of all Methane HPI’s in Queensland.**

**9th March Inspector Smith**

***Q. Let's have a look at the mine record entry for 9 May 2018, which is RSH.002.273.0001. Do you recall seeing that?***

***A. I have seen that MRE, yes.***

***Q. If we go to page 3, do you see at paragraph 5 there was an acknowledgment that continued HPIs with methane greater than 2.5 per cent was not satisfactory and the mine must ensure that such HPIs are minimised and preferably eliminated going forward?***

***A. Yes, I do.***

***Q. If we go back to the first page, please, and scroll down so we can see the text at the foot of the page, please, do you see there it is said:***

***“We explained that the mine had reported 32 HPIs since LW 102 had commenced production in January 2018.***

***And this is May 2018.***

***This represented 60% of all HPIs in Queensland associated with Methane greater than 2.5% in the Longwall tailgate.***

***A. Yes.***

**If the correct term of Inrush was used at the Grosvenor Mine from 2016 on, then there would have specific defined Regulations to follow. (for example CMSHR S 265, S 292, S 293 and S 294) Attachment 1**

**These are the most relevant sections**

***293 Risk assessment***

***(2) The site senior executive for the mine must ensure a risk assessment is carried out to see whether the mine’s method of working and precautions adopted in the workings reduces the risk to acceptable levels.***

***(3) If the method, or precautions, are subsequently revised, the underground mine manager for the mine must ensure a further risk assessment is carried out***

***294 Standard operating procedure***

***(1) An underground mine must have a standard operating procedure for the method of working, and precautions to be adopted, in mine workings where an inrush source exists.***

***(2) The standard operating procedure must be—***

***(a) updated as often as changes are made in the method or precautions; and***

***(b) displayed on—***

***(i) a noticeboard situated at the surface of the mine and accessible by the coal mine workers; and***

***(ii) a noticeboard situated underground in each area of the workings where the inrush source exists***

**GROSVENOR DEVELOPMENT INRUSHES**

**Grosvenor Mine has been subject to Methane Inrushes from the floor since the development of Longwall block LW 101 in 2016.**

**These have occurred both in development and on the longwall face while it was operating cutting coal.**

**These Inrushes are accompanied by floor heave with cracks running roughly down the centre “heaved” roadway.**

**The best way to imagine it is a one lane dirt road with the raised centre having a crack say 6 inches wide on the surface.**

**GROSVENOR LONGWALL INRUSHES**

[**https://coalminesinquiry.qld.gov.au/wp-content/uploads/2021/04/LFI-investigation-report-for-serious-accident-06052020.pdf**](https://coalminesinquiry.qld.gov.au/wp-content/uploads/2021/04/LFI-investigation-report-for-serious-accident-06052020.pdf)

**On page 15 of the Grosvenor LFI Report provided to the Mines Inspectors is a table of 14 Methane HPI’s between the 18th of March 2020 and the 21st of April 2020 on the LW 104 Block (Attachment 2)**

**THERE ARE TWO DISTINCT TYPES OF EVENTS.**

**In Nine (9) out of Fourteen (14) (64%) of the Methane HPI’s; the source of methane is from the floor.**

**THOSE IN YELLOW COMING FROM FACE or FLOOR. S243 Sensor in the Tailgate does not change.**

**THOSE IN BLUE COMING AT TAILGATE END OF ROADWAY FROM GAS MIGRATION FROM GOAF. The 400m and Outbye Sensor quantities at no stage go near 2%.**

**I note than the last HPI on the 21st of April 2020 records an Explosive level of 5.04% Methane. at the 243 Sensor of the Tailgate Chock #149 Canopy**

**Methane Inrushes do occur on the Grosvenor Longwall Face as evidenced by this Methane HPI on LW 103**

***203/07/19 TG area and return roadway***

***LW103 The floor blower located at #55 roof support released approximately 2,463m3 after 1 hour***

***LW103 Shearer cutting to MG. At roof support #9 when floor blower activated at #22 and #55. TG***

**There was no attempt made at all to drain the floor seams of gas for Longwall Operations, even though the Grosvenor Mine has identified that the GML seam would be releasing floor gas inbye 20 cut-through in its Second Workings Notices for LW 104**

**This despite the fact that Grosvenor Mine had introduced a “PIFF” program (Proactive Inter-burden Forced Fracturing) in Development. This was to try and stop “methane inrushes” (with combined floor heave) into the Development Panel while the Roadways are being driven.**

***https://www.qldminingcrisis.com.au/2021/04/13/piff-proactive-interburden-forced-fracturing-trials-at-grosvenor-mine-to-mitigate-the-floor-gas-and-floor-heave-events-in-mg-104-and-mg-105/***

**Due it seems quite deliberate terminology.**

**Instead of reading ‘uncontrolled “flood” of methane both the Management and then the Inspectors use the word “release”.**

**Inspector Paul Brown in his Mine Record Entry (Attachment 3) dated the 4th of May 2017 shows how the definition of a Methane Inrush, except for the word “flood” which has been replaced by “release”.**

**Inspector Brown issue Two (2) Section 168 Directives**

***168 Directive to review safety and health management system and principal hazard management plans***

***If an inspector believes the safety and health management system or a principal hazard management plan for a coal mine is ineffective, the inspector may give a directive to review the safety and health management system or the principal hazard management plan and make it effective.***

**This is an excerpt of the Mine Record Entry.**

***“My concerns from these events is there is a lack of follow up investigation into the circumstances. The current phenomenon of floor heave in the gateroads is not fully understood meaning understanding and tracking the mechanism that is initiating the heave and, where is the reservoir of methane that is being released during the floor heave events? The hazard is not currently identified on the Geological Hazard Plans and is not referenced within the Permit to Mine. A Directive was issued to the SSE in relation to the risk presented by the floor heave events.***

***Pursuant to section 168 of the Coal Mining Safety and Health Act 1999***

***Floor Heave and uncontrolled Methane release***

 ***To reduce risk by:***

***1 . Conducting investigations into the floor heave events causing uncontrolled releases of methane contained within MREs dated 3/05/17, 4/05/17. (to be completed by 19/05/17) and:***

***2. Identify SHMS controls to be developed or reviewed specifically for identifying, managing and controlling the risk of uncontrolled methane releases induced by floor heave. Provide the Inspector with a report of actions taken immediately and proposed actions to address the issue. (to be completed by 26/05/17)***

***Please provide a written status report on each Directive together with the actions taken to address each item by their due dates***