Mackay District Office

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| Mine Name | Mine ID | Operator | Activity Type | Region | Activity Date |
| Moranbah North | Ml 00750 | Anglo Coal (Moranbah  North Management) Pty  Ltd | Inspection | Central | 1 0/08/2017 |

Vision: Our Industries Free of Safety and Health Incidents

# Mine Record Entry

This report forms part of the Mine Record under s68 of the Coal Mining Safety and

Health Act 1999, It must be placed in the Mine Record and displayed on Safety Notice Boards.

Note that inspection or audit activities conducted by the Mines Inspectorate are based upon sample techniques, It remains the primary responsibility of Mine Personnel to identify hazards, and risks associated with Operations and ensure those risks are at an acceptable level.

I, Mr Leslie Marlborough, Inspector of Mines conducted an inspection at Moranbah N01th

Mine on Thursday 10 August 2017. I arrived on site at approximately 08:20 and was met by Mr Neville Stanton, Underground Mine Manager and Mr Craig Manz, General Manager/Site Senior Executive.

Opening Meeting

The opening meeting was attended by Mr Manz, Mr Stanton, Mr Paul Stephan, Production Manager, Mr Graham Morris, Technical Services Manager and Mr Paul Wild, Ventilation Superintendent. Mr Manz gave an update on the current status of the mine. Longwall 1 12 had commenced production and had retreated to 3820 chainage. The Longwall had not retreated past "square" as yet but was producing well. They had experienced some cavities on the Longwatl but had managed these without the need for cavity filling by double chocking as required. The Longwall had retreated through the shear zone and was performing welt. Development is taking place with two development units. The Moranbah North development crews are mining in 603 MG with CM008. There is a second development unit, a contract development unit manned by Mastermyne which is mining in TG 603 using CM005, an ABM machine and has reached 5 CT. A third contract development unit is planned to commence later in the year during October to enable the mine to maintain Longwall continuity and it will mine MG 604.

I explained that the purpose of the inspection was to discuss the gas issues being experienced at the mine, to discuss the serious injury that had occurred on 9 August in the TG603 pane] and to discuss the MRE submitted by the ISHR regarding return to work restrictions and management of the return to work of a coal mine worker diagnosed with CWP.

I gave an update of recent incidents in the region and discussed the fatality that occurred at an open cut mine on 4 August, After discussion of the fatality I agreed to forward to Mr Manz a copy of the News Bulletin that was issued by DNRM regarding the incident. We discussed places at the mine where similar activities may take place which could be applicabte.

With regards to the MRE from the ISHR j asked what the mine had done regarding the return

to work program for the CMW and the controls the mine was putting in place to manage the return to work program. Mr Manz explained that the CMW was diagnosed with very early stages of CWP by Doctor Robert Edwards. The restrictions placed on the CMW by Dr Edwards was that he must not be exposed to respirable dust in excess of 1 mg/m . The restriction did not restrict or prohibit the CMW from underground work. The mine decided at this stage that the CMW should remain at home, until a medical management plan was developed and agreed. WorkCover arranged for a medical practitioner, Dr Sid O'Toole to conduct an assessment and to develop the medical management plan. Dr O'Toole attended the mine and went underground to Longwall, Outbye and Development and developed a medical management plan. The plan allowed for the CMW to work underground, but not on Longwall and stipulated additional personal respirable dust monitoring and other controls. The medical management plan was reviewed by Dr Edwards who endorsed the medical management plan. Mr Manz agreed to forward me a copy of his response to the ISHR's MRE on the matter. To this date, the CMW had not returned to work.

A discussion was then held regarding the injury to the coal mine worker, Lee Moyes, a Mastermyne Contractor on 9 August in TG 603. Mr Manz explained that the CMW was operating the LHS rib bolter at the time of the incident. He was installing a rib bolt and had retracted the timber jack to insert the rib bolt plate and was inserting the dolly while pushing the timber jack and drill head back out. This meant that the rib borer was in slow mode and as such, does not require two handed operation. The coal mine worker crushed his left thumb between the timber jack and the feed carriage slide. The CMW was taken to hospital in Mackay and will have surgery on his thumb sometime today. There was no broken bones and the CMW was not detained in hospital overnight. The initial investigation has shown there was a neoprene guard missing from the drill head which would have prevented the CMW putting his thumb into the pinch point. The other rib borer on the miner and all other rib borers were subsequently checked and all had the neoprene guard in place.

A discussion was then held regarding the Longwall 1 12 Methane issues that the mine was experiencing, These had resulted in 4 occasions in the previous 2 weeks when the Methane in the TG had exceeded 2.5% as measured on the TG Outbye Methane monitor. The mine was finding that this monitor appeared to be reading high. The monitor had been checked on each occasion of an exceedance by bag sample and the sample run through the gas chromatograph. These readings have been as much as 0.4% higher than that shown on the TG real time sensor. asked whether the mine had seen higher than 2.5% Methane on the general body sensor at the inbye end of the TG and was told that this monitor typically read approximately 0.4% Fess than the Outbye monitor because of Methane leaking through seals in the TG roadway (approximately 3.8 km long). The goaf drainage had been increased in capacity for Longwall 1 12 and was drawing over 7,000 1/s. The Methane monitoring system has recently been changed to a new system. The Outbye TG Methane monitor appears to be reading high and on numerous occasions when there has been gas measured at or above 25% at the outbye monitor, bag samples taken from this point have shown Methane to be lower by up to 0.4%. The mine detailed the two trials currently being undertaken as it is believed that the Methane readings are affected by humidity and air velocity. One trial is to "dry" the atmosphere before it passes over the sensor head and the second is to have a "baffle" plate in front of the sensor head to reduce the impact of air velocity on the sensor head. These 3 monitors are running concurrently but the original Outbye TG Gas monitor is still the monitor that is used and is connected to the shearer interlock that trips power at 2.5% and slows the shearer at 2.0%. Mr Manz stated that, even when they have an exceedance and the bag sample shows the methane is lower than 2.5% the shearer interlock to the real time monitor is left active (i.e. the shearer remains depowered until the gas drops below 25%)

I asked what the error specifications were on the new gas monitors. Surprisingly, this was not known. I suggested that they should find out what the OEM states is the normal error parameters of the Methane detector (+/-) so that they could understand what is a normal, acceptable variance. The Australian Standard states that for a 0-5% range the error 3% is +1-

0.21 I asked whether the gas monitor is calibrated in line with the Australian Standard AS 22903 Maintenance of Gas Detecting and Monitoring Equipment. It was believed to be done but the calibration process has not been audited to determine whether or not it complies with this standard. I also suggested that they get a calibration procedure from the OEM that complies with the standard and to be sure that they are calibrating the sensor head in Eine with the OEM requirements. I also suggested that the mine should do audits of the Methane readings at the other methane monitors installed throughout the mine to determine whether there were errors being experienced on other Methane monitors as part of the new gas monitoring system installed throughout the mine. I suggested that the mine also do auditing on the span gas used for the weekly calibration as it has an error as supplied by the OEM. This should be specified on the calibration gas bottles. This could be run through the gas chromatograph to check its accuracy.

At this stage we decided to proceed underground to visit the LW TG area, as the Longwall was on maintenance so that we could look at the TG Gas monitors and then we would go to TG 603 Development panel to view the scene of the incident from the previous day.

Before going underground I inspected the control room and viewed the gas alarm logs. These were to a good standard and were all signed off as appropriate. There were no active alarms and the CRO was fully aware of the gas monitoring arrangements in the LW TG and the alarms and trip levels that the monitors were set at. He informed me that the Outbye TG Methane monitor had a time lag of approximately 15 minutes before it tripped power to the shearer. I read the ERZ Controllers statutory inspection reports for the areas of the mine that we were going to visit. They were to a good standard and I noted that the ERZ Controller District Allocation board and noted that the ERZ Controller in 603 TG was T Gulliver.

Underground Inspection

I was accompanied underground by Mr Manz, Mr Stanton, Mr Wild and Mr Stephan. The vehicle was clean and the pre start had been completed correctly. The Outbye roads were in good condition. Most of the travel roads have now been treated with Fibrecrete and are well illuminated, Stonedust standards were very good. The mine is to be commended on the high standards all around the mine.

## I-WI 12 TG

Before going through into the return I examined the Methane Sensor that was located outbye of the TG doors in intake air. This was the trial sensor to "dry" the air before it passes over the sensor head and is known as Sensor #4. Mr Stanton explained that the mine had ordered a special cabinet with its own air pump and drier which was expected in a few days. The current set up was a trial. This sensor was reading 1 .27 % Methane, which I noted was suspiciously low. We then went through into the LWI 12 TG return. The real time sensor is part of a 4 way tree and is mounted on the outbye rib line in an appropriate position. This is known as sensor  observed that this sensor was reading 1.8% Methane. When we held an I TX beside this sensor it also read 1.8% Methane. A second I TX in the same position read 1.7% Methane. Sensor #3 was a 4 way bank of sensors hung at head height in the roadway with the backing plate acting as a shield to shield the sensors from the air velocity. This Methane monitor was

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reading 1 .63% Methane. Mr Wild took wet and dry bulb temperatures that were reading 29C wet and 300C Dry. The air velocity was measured with a Kestrel and was 4.6 m/s. The

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effective temperature was therefore 22.5C. Mr Stanton explained that there was a tube run from the intake side of the TG double doors that ran to a point beside the sensor head (sensor #1). The bag samples taken to verify the Methane readings on Sensor #1 were taken using a standard plastic "airbed" type pump through this tube. I noted that the outbye TG tube bundle sample point was mounted in the same location as the other gas monitors. Mr Stanton explained that there was a time lag on the Outbye TG sensor which varied as the Longwa[l retreated (the time lag was reduced as the Longwall retreated). The time lag is set due to the distance that the Outbye TG sensor is from the face (almost 4.0 km), I pointed out that the

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current time lag is 12 minutes and that means that before the TG sensor trips shearer power there could be 3.2 km of roadway with excess of 25% Methane. Mr Manz stated that there was still the inbye Methane monitor which is maintained within 400 m of the Longwall face and it generally reads 0.4% less than the Outbye Methane monitor. suggested we continue the discussions when we returned to surface.

TG 603 Development

The outbye tag board and diesel tag boards were in good condition and appeared to be correctly used. The Outbye inspection board was well completed and the District was open with no hazards identified on the board. Roadway and stonedust standards up to the crib room were good. At the crib room we met Assistant Undermanager Brett Moylan. He explained to me that the crew (Mastermyne Contractors) were on panel advance. asked about the ERZ Controller and he stated that there was a Deputy in the heading and when I asked where Mr Gulliver was, he stated that he had gone to get some brattice to go out to do a job for him. When I asked Mr Moylan who was in charge of the activities in the panel he seemed confused I explained that, according to the District Allocation Board on the surface Mr Gulliver was the ERZ Controller for the District. Mr Stanton confirmed that Mr Gulliver was the ERZ Controller.

Crib room standards were good. There was several coal mine workers in the crib room having crib. They explained they were in panel advance and we had a discussion about the tasks they were doing and they were confident that they understood the hazards and appropriate controls. They understood where procedures were kept and where their emergency equipment was located.

We were then joined by the ERZ Controller, Mr T Gulliver. I read his stat report from his first inspection of the district and commented on the good standards that I had seen up to that point. We then proceeded along the travel road inbye. The roof and rib conditions were very good. There was a group of coal mine workers with an LHD and man basket who were setting up to recover and advance a power cable. I checked the pre start card on the LHD, which was in order, and we had a discussion with them about the hazards they had identified. They understood the task well and Mr Stephan suggested that they should turn the LHD around so that they were on the intake side of any dust that they may disturb from the roof while dropping and re hanging the cable. They did this and I told Mr Stephan that this was a good observation and is an example of how we have now improved our awareness of inhalable dust as well as respirable dust.

On the way inbyel I noted that there were a lot of steel rib bolts that had excessive bolt tails which means they are incorrectly installed. Very few of them, if any} had additional bolts installed alongside. Mr Gulliver stated that they had trouble with the top rib bolt on the continuous miner getting the bolts installed correctly. I explained that, even in that case, it was not acceptable to simply leave the defective bolts and carry onr There was no mention in any of the stat reports that I read that stated there was issues correctly installing roof/rib bolts. I pointed out that there were also the centre and lower bolts where there was a significant number of bolts with excessive long bolts tails. There were also, but not as many, quite a few roof bolts that were incorrectly installed with obvious long boft taiEs. asked Mt Stanton whether there was a mapping process where the Geotechnical Engineers mapped the installed support as the miner advanced. He confirmed that there was. It was apparent that this mapping process was not identifying incorrectly instalEed support.

At the Miner I inspected the scene of the accident the previous day and could observe the rib bolter with the neoprene guard that was missing at the time of the accident, but had since been replaced. It was assumed that the operator was holding the rib bolt plate in position while he stretched backwards to operate the drill rig to push out the timber jack and drill head. Face conditions were good and the strata conditions in the roadway were very good. i examined several QDS equipment pods and noted that their compliance plates and pre start cards were all up to date.

Close out Meeting

The close out meeting was attended by Mr Manz, Mr Stanton, Mr Paul Stephan, Mr Graham Morris, Manager and Mr Paul Wild. We discussed the observations of our underground inspection.

We discussed the 603 TG first and in particular the defective strata support that we observed. I will issue an SCP for the mine to conduct an investigation into why the defective strata supports had not been identified during routine mapping and to review the effectiveness of the strata mapping process.

We discussed the confusion that the Assistant Undermanager had when asked regarding who was in charge in the development district. Mr Stanton stated that he would be addressing that.

I commented on the high standards around the mine and in the development panel

We then continued the discussions around the LW 1 12 TG gas. We discussed the TARP MNM 50018.10 TARP 1 Gas and Atmosphere Management. We discussed the time lag on the Outbye TG Gas monitor before it trips shearer power. We discussed this time lag as it means that this monitor is not an instantaneous trip. We also discussed the TARP whereby the shearer is not tripped by Methane exceeding 25% in the TG if it is in the TG Shuffle Zone. There is no definition in the TARP as to where the TG Shuffle Zone is on the face. Mr Stephan stated that this is set on the parameters on the face. The IJMM does not control these parameters and does not have to approve any changes. As such, they could be set by anybody for any position, There has been no data to identify where the shearer is located on the face when methane is flushed out by the shearer being at the TG end of the face. My experience js that most Methane is flushed out when the shearer is actually out of the TG end not when it is positioned right over the TG end. If the TG Monitor has a delay of up to 15 minutes before it trips the shearer then by the time any Methane that is flushed out by the shearer reaches the outbye monitor (about 15 minutes with face length as it currently is) and then adding another 12 minutes before the Outbye monitor trips the shearer, then this means the shearer could be almost at the MG End before it was actually tripped. If the Methane monitors are as unreliable as believed, then the inbye TG monitor could be reading higher than the Outbye monitor and the Methane may not trip that monitor. There is no data available to determine what the error is on the inbye TG monitor. Mr Manz stated that the TG AFC monitor was in place and it would trip power to the Longwall at 2% methane. A discussion was held regarding the actual position of the TG Drive monitor and where the shearer drum was in relation to this monitor when the shearer cut into the TG. I will issue a recommendation that the mine conduct more detailed and structured investigations into the gas monitoring system installed around the mine to determine the accuracy and effectiveness of the gas monitors to identify any issues with the accuracy of the gas monitors.

An Infra-Red Methane monitor had been used on previous LW blocks in the TG because of the unreliability and inaccuracy of the previous Methane monitors in the TG. Mr Wild stated that this monitor had issues when it was used in TGI 12 and so the decision was made not to use the infra-red monitor. I suggested to Mr Wild that he conduct more detailed investigations to get the issues with the Infra-red monitor working as it was a very reliable and accurate monitor on previous LW blocks. I suggested that the real issue was not the gas monitors but the amount of Methane Gas in the TG which has the levels too close to 2.5%. E will be issuing an SCP for the mine to review the TARP - MNM 50018.10 TARP 1 Gas and Atmosphere Management. I also request that the mine send me a copy of the reviewed TARP when it is completed.

I thanked the mine for their time and the frank and honest discussions that we had. It is my intent to return to the mine in approximately 1 month to review the progress on the items we had discussed today.

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| Number | Substandard Condition or Practice | Due Date |
|  | Strata Support Auditing | 14/09/2017 |

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| Number | Substandard Condition or Practice | Due Date |
| 2 | Review of TARP 1 Gas and Atmosphere Management | 14/09/2017 |

Conduct an investigation into why the defective strata supports had not been identified during routine mapping and to review the effectiveness of the strata mapping process.

Mine to review the TARP - MNM 50018.10 TARP1\_Gas and Atmosphere Management and assess the effectiveness of the controls for managing Methane levels in the Longwall TG.

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| Number | Recommendation | Due Date |
| 3 | Investigation into Gas Monitoring System | NIA |

Conduct more detailed and structured investigations into the gas monitoring system installed around the mine to determine the accuracy and effectiveness of the gas monitors in the LW TG and at other locations around the mine to identify and quantify any issues with the accuracy of the gas monitoring system in line with Australian Standard AS 22903 Maintenance of Gas Detecting and Monitoring Equipment.

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

Les Marlborough

Inspector of Mines

Central Region