

WRAC RISK ASSESSMENT

Note: This document is controlled whilst it remains in the Grasstree Mine Intranet. Printed copies created from this document are deemed to be uncontrolled and are only valid on the day of printing.

Risk Assessment Title: Longwall Tailgate Gas Monitoring RA

Document Number: RA.GTM.1153

AMENDMENTS			
ISSUE No:	ISSUE DATE:	DESCRIPTION	INITIAL
1	09 April 2020	New Document	James Moreby

This document was approved by the above listed as indicated by signature on the original copy. Original copies are kept by the Underground Operations Health and Safety Department. This document has been edited or reformatted to meet current standards of document control. The intent and content of the document is unchanged.

1. PURPOSE

The purpose of this document is to help ensure that Grasstree Mine is compliant with the Coal Mining Safety and Health Act 1999, the Coal Mining Safety and Health Regulations 2017 and the Anglo Coal Australia SHECMs standards for the activities referred to in this document.

Specifically, this document is designed to help ensure that risk from coal mining operations at Grasstree Mine is at an acceptable level (i.e. that risk is as low as reasonably achievable and within acceptable limits).

2. SCOPE

This document applies (to the extent that it is relevant) to the following persons:

- All coal mine workers and all visitors at Grasstree Mine engaged in the activities referred to in this document; and
- All other persons who may affect the safety and health of workers or other persons at Grasstree Mine engaged in the activities referred to in this document.

3. COMPLIANCE

This document forms part of Grasstree Mine's Safety and Health Management System. In accordance with section 39 of the Act coal mine workers and other persons have a statutory obligation to comply with this document.

4. INTRODUCTION

This Risk Assessment has been conducted to ensure that all foreseeable risks have been assessed and adequate controls have been put in place to either eliminate or minimise the risks. Legislation relevant to this risk assessment include:

- Coal Mining Safety and Health Regulation 2017, Regulation 234
- Coal Mining Safety and Health Regulation 2017, Regulation 234A
- Coal Mining Safety and Health Regulation 2017, Regulation 243
- Coal Mining Safety and Health Regulation 2017, Regulation 243A
- Coal Mining Safety and Health Regulation 2017, Regulation 244

A risk assessment following the principles outlined in AS/NZS ISO 31000:2009 format and complying with Risk Management standards was conducted for Grasstree Mine.

5. BACKGROUND INFORMATION

The purpose of this RA is to identify the specific hazards around real time gas monitoring located in the Longwall return at Grasstree Mine,

- RA.GTM.735 for gas monitoring covers the generic risks for gas monitoring installations
- The Second Workings Risk Assessment completed for each longwall block covers the overall gas management hazards and controls
- This risk assessment is not to determine the TG gas monitoring requirements for each longwall block, as that is assessed on a block by block case and is captured in the Second Workings SOP
- This risk assessment is to review to risk of real time gas monitoring in the LWTG and does not include gas bag sampling or tube bundle monitoring

6. DEFINITIONS

Act:	<i>Coal Mining Safety and Health Act 1999</i>
Regulation:	Coal Mining Safety and Health Regulation 2017
Coal mine worker:	An individual who carries out work at a coal mine and includes the following individuals who carry out work at a coal mine: <ul style="list-style-type: none"> • An employee of the coal mine operator; • A contractor or employee of a contractor.
Shall:	Indicates that a statement is mandatory
SHMS:	Safety & Health Management System (a documented system that incorporates risk management elements and practices that ensure safety and health of persons who may be affected by coal mining operations)
Should:	Indicates a recommendation
SOP:	Standard Operating Procedure
SSE:	Site Senior Executive
SWG:	Standard Working Guide (interchangeable with SWP)
SWP:	Standard Working Procedure (interchangeable with SWG)

7. CORRECTIVE ACTION/TASK ASSIGNMENT REGISTER

See 4th tab titled 'Action Plan'

8. DISAGREED MATTERS

Coal Mining Safety and Health Regulation 2017 Chapter 2, Part 2, Division 2, Regulation 10 (1) (d) clearly identifies the need to reach agreement in the development of Standard Operating Procedures. This Risk Assessment has been prepared and distributed to those involved in the process as per the requirements detailed in the Regulation Chapter 2, Division 2 Regulation 10 (1) (d). Any objections must be addressed by the SSE in accordance with Coal Mining Safety and Health Regulation 2017 Chapter 2, Part 2, Division 2, Regulation 10 (1) (d). Should you have any objection, please note below.

Note: Following completion of this Risk Assessment, minor administrative adjustments (i.e. typographical errors corrected, additional specificity in recommended action descriptions and action identification numbers added) were made compared with the document originally countersigned by the cross section of the workforce. For this reason the finalised and digital copy of this Risk Assessment varies slightly from the original signed archived document. The administrative changes undertaken have not changed the intent of the document, or remove any controls managing risk.

NAME	OBJECTION DETAILS	SIGNATURE	DATE

9. SENIOR SITE EXECUTIVE (SSE) SIGN OFF

Coal Mining Safety and Health Regulation 2017 Chapter 2, Part 2, Division 2, Regulation 10 clearly identifies the process to reach agreement in the development of Standard Operating Procedures. The SSE has addressed all disagreed matters as per Coal Mining Safety and Health Regulation 2017 Chapter 2, Part 2, Division 2, Regulation 10 and approves this Risk Assessment

SSE	NAME	SIGNATURE	DATE
	DAMIEN WYNN	[REDACTED]	20/5/20

10. REVIEW CRITERIA

This document shall be reviewed as follows:

- Every FIVE years as per Anglo procedures;
- When there is a change of method and/or technology that may affect the accuracy of this document;
- When there has been a significant event to which this document was relevant.

11. REFERENCES

Anglo Coal Australia SHECMS Standard 5.1.OPSRISK.1 The Management of SHEC Risk
 AS/NZS ISO 31000:2009 Risk management – Principle and guidelines
 MP.GTM.002 - Risk Management Plan
 QLD Govt. Mining Hazards Database
 Coal Mining Safety and Health Act 1999
 Coal Mining Safety and Health Regulation 2017
 Recognised Standard 02 – Control of Risk Management Practices

Reference Document Title	Reference Document Link / Screenshot		
SOP.PHMP.GTM.005.1.249 Taking Action when Methane Detected at a Ventilation Split or Main Return Airway	As per the Grasstree SHMS		
SOP.PHMP.GTM.005.1.250 Action to be Taken if Methane Detector Activates or is Non-Operational	As per the Grasstree SHMS		
SOP.PHMP.GTM.005.1.252 Use of Portable Gas Detectors in Event of Failure or Non-Operation of Mine Gas Monitoring System	As per the Grasstree SHMS		
Gas Principal Hazard Management Plan (PHMP.GTM.005.1)	As per the Grasstree SHMS		
TARP.001.PHMP.GTM.005.1 Gas Management TARP	As per the Grasstree SHMS		
SOP.MP.GTM.019.306 Grasstree Mine Statutory Inspection Scheme	As per the Grasstree SHMS		
SOP.GTM.416 910 Second Workings	As per the Grasstree SHMS		
Mining Hazards Database (Relevant section below)	https://www.business.qld.gov.au/industries/mining-energy-water/resources/safety-health/mining/hazards/hazards		
Risks	Mechanism/Risk Factors	Controls	Further information
Flammable gas accumulating at the face	Migration of gas from goaf	Appropriate ventilation practices	Proceedings of the Seventh Annual Conference 1988
		Improved standards	Working Smarter 1991
		Inertisation	25th International Conference of Safety in Mines Research Institutes 1991
		Methane leaching	Mine Safety and Health Congress 1987
		Mine layout - direction of extraction	Technology in Mine Health and Safety 1992
		Pre- and post mining gas drainage	Proceedings of the 23rd International Conference 1989
		Support design	Safety in Mines Research: Proceedings of the 21st International Conference of Safety in Mines Institutes 1985
		Ventilation / gas management plans	Safety in Mines Research: Proceedings of the 22nd International Conference of Safety in Mines Institutes 1988
		Work of ventilation officers	Prediction of Gas Emission from Longwall Face 1981

Attendance/ Validation

The facilitator is required to have the qualifications:

Facilitator Name:	James Moreby	Signature to Confirm Qualifications	
-------------------	--------------	-------------------------------------	--

The selection of the following personnel is in accordance with the requirements of Coal Mining Safety and Health Regulation 2017 Chapter 2, Part 2, Division 2, Regulation 10 (1) (a). Personnel must declare their purpose and role in Risk Assessment. Eg: Participant - Electrician

Initials & Surname	Position	Department	Qualifications and Relevant Experience	Years of Experience	Role in current risk assessment	Signature	Date
J.Moreby	VO	Technical Services	S1, 2 & 3 / G2 / VO / Mining Eng	6	Facilitator		12/5/2020
C.Coleman	Electrician	Longwall	Trade Cert	8	Participant		13-5-20
D.McDonald	Miner	Longwall	CMW	15	Participant		13-5-20
D.Lamaro	Operations	Longwall	S1, 2 & 3 / G2 / Mining Eng	5	Participant		13-5-20
B.Murphy	Miner	Longwall	CMW	30	Participant		13-5-20
R.Harris	LW ERZC / SSHR	Longwall	ERZC	23	Participant		12-5-20
C.Rodger	Fitter	Longwall	Trade Cert	27	Participant		12-5-20

ORIGINAL ISSUE DATE 9 April 2020
 ISSUE NUMBER/DATE 1 / 9 April 2020

TODAYS DATE 12/05/2020 3:11 PM

Risk Assessment

TITLE:			Longwall Tailgate Gas Monitoring RA						DATE:	11-May-20		
#	Area / task / Activity	Identified Hazard	Current Controls	Control Type	Control Quality	Control Effectiveness	Most Reasonable Consequence (given current controls)	Likelihood of the Event (given current controls)	Risk Rank	Consequence Type	Additional Controls	Has an acceptable level of risk been achieved Yes/No
		Faulty sensor resulting in incorrect gas reading or recording	OEM supplied Gas system ensuring sensor constructed to relevant standards and QA/QC requirements	2: Administration	1: =or>90%	2	2: Minor	2: Unlikely	5 (L)	(BI/MD) Business Interruption, Material Damage and Other Consequential Loss		Yes
			Calibration regime underlined by AS2290 3 to ensure calibration and sensor maintenance is to a satisfactory standard	2: Administration	1: =or>90%	2						
			ERZ controller inspections as per SOP.MP.GTM.019.306 Grasstree Mine Statutory Inspection Scheme to challenge test the fixed monitor with PGD	2: Administration	1: =or>90%	2						
			CRO Citect alarms for faulted sensors	2: Administration	1: =or>90%	2						
			Fit for purpose equipment for designated ERZ classifications to ensure device integrity during service life	4: Engineering	1: =or>90%	1						
			Trained and authorised personnel (electricians) on gas monitoring system	2: Administration	1: =or>90%	2						
			Grasstree Work order system for maintenance and checks on all sensors	2: Administration	1: =or>90%	2						
			Introduction to site process to ensure unit meets site requirements and maintenance tasks generated to ensure longevity	2: Administration	1: =or>90%	2						
			SOP.PHMP.GTM.005.1.249 Taking Action when Methane Detected at a Ventilation Split or Main Return Airway SOP.PHMP.GTM.005.1.250 Action to be Taken if Methane Detector Activates or is Non-Operational SOP.PHMP.GTM.005.1.252 Use of Portable Gas Detectors in Event of Failure or Non-Operation of Mine Gas Monitoring System providing the governing processes for reliable and compliant sensor installation	2: Administration	1: =or>90%	2						
			Sensor installed incorrectly (set points / trending / CITECT password protected)	Gas calibrations which will highlight if setpoints have been installed incorrectly	2: Administration	1: =or>90%					2	
		WO generated for 6 monthly set point audits		2: Administration	1: =or>90%	2						
		VO CITECT audit completed monthly as part of the monthly ventilation survey		2: Administration	1: =or>90%	2						
		CITECT overview system – trending and set point screen		2: Administration	1: =or>90%	2						
		Citect password protected		2: Administration	1: =or>90%	2					(L&R) legal &	

Dogleg sensor	location) resulting in >2 5% in the TG Roadway	ERZ controller inspections as per SOP.MP.GTM.019.306 Grassree Mine Statutory Inspection Scheme to ensure gas monitors have been installed in the correct position during installation of the monitor	2: Administration	1: =or>90%	2	2: Minor	2: Unlikely	5 (L)	Regulatory		Yes
		Critical Controls to review the Gas Monitoring process	2: Administration	1: =or>90%	2						
		VO Authorisation for relocation/commissioning and removal of gas monitoring infrastructure – reg: 225.	2: Administration	1: =or>90%	2						
		ERZC sign of required on gas monitoring Work orders	2: Administration	1: =or>90%	2						
		25002 and 25003 Gas monitoring plans as maintained by VO.	2: Administration	1: =or>90%	2						
		Locations set in CMHSR 2017	2: Administration	1: =or>90%	2						
	Sensor exposed >2 5% CH4	LW automation and cutting cycles with setpoints to slow production to reduce gas make	4: Engineering	1: =or>90%	1	2: Minor	2: Unlikely	5 (L)	(L&R) legal & Regulatory	LW TG Dog Leg Sensor to be established with identical shearer automation triggers as the Tailgate Roadway sensor to mitigate risk of gas exceedence due to production make (Initially: 1 5% Activation, 1 9% Stop Haulage and 1.75% unlatch, subject to review as per Gas Monitoring SOP Setpoint Change Process)	Yes
		Fit for purpose equipment for designated ERZ classifications to ensure device integrity during service life	4: Engineering	1: =or>90%	1						
		>35m3/s ventilation across the Longwall face	4: Engineering	1: =or>90%	1						
		TARP.001.PHMP.GTM.005.1 Gas Management TARP for triggers and response requirements when mining	2: Administration	1: =or>90%	2						
		Vertical post gas drainage boreholes every 50m along the TG roadway and every 100m along the MG roadway	4: Engineering	1: =or>90%	1						
		Inseam post gas drainage GH/C2 and GL boreholes to remove excessive gas from the mine environment	4: Engineering	1: =or>90%	1						
		Gas Drainage plant capacity to drain gas from the mine environment	4: Engineering	1: =or>90%	1						
	UIS predrainage of seam	4: Engineering	1: =or>90%	1							
	Sensor located in the incorrect position (Sensor does not comply with CSMH Reg 2017 requirements or PHMP.GTM.005 or Sensor does not detect representative General Body Measurements)	25002 and 25003 Gas monitoring plans as maintained by VO.	2: Administration	1: =or>90%	2	2: Minor	2: Unlikely	5 (L)	(L&R) legal & Regulatory		Yes
VO Authorisation for relocation/commissioning and removal of gas monitoring infrastructure – reg: 225.		2: Administration	1: =or>90%	2							
Trained and authorised personnel (electricians) on gas monitoring system		2: Administration	1: =or>90%	2							
ERZ controller inspections as per SOP.MP.GTM.019.306 Grassree Mine Statutory Inspection Scheme to ensure gas monitors have been installed in the correct position		2: Administration	1: =or>90%	2							
	OEM supplied Gas system ensuring sensor constricted to relevant standards and QA/QC requirements	2: Administration	1: =or>90%	2							
	Calibration regime underlined by AS2290 3	2: Administration	1: =or>90%	2							
	Fit for purpose equipment for designated ERZ classifications	4: Engineering	1: =or>90%	1							
	Trained and authorised personnel (electricians) on gas monitoring system	2: Administration	1: =or>90%	2							

LW TG roadway sensor (<400m from the cutting face)	Faulty sensor resulting in incorrect gas reading or recording	Grasree Work order system for maintenance and checks on all sensors	2: Administration	1: =or>90%	2	2: Minor	2: Unlikely	5 (L)	(L&R) legal & Regulatory	Yes	
		Introduction to site process to ensure unit meets site requirements and maintenance tasks generated to ensure longevity	2: Administration	1: =or>90%	2						
		SOP.PHMP.GTM.005.1.249 Taking Action when Methane Detected at a Ventilation Split or Main Return Airway SOP.PHMP.GTM.005.1.250 Action to be Taken if Methane Detector Activates or is Non-Operational SOP.PHMP.GTM.005.1.252 Use of Portable Gas Detectors in Event of Failure or Non-Operation of Mine Gas Monitoring System providing the governing processes for reliable and compliant sensor installation	2: Administration	1: =or>90%	2						
	Sensor installed incorrectly (set points / location) resulting in >2.5% in the TG Roadway	Gas calibrations which will highlight if setpoints have been installed incorrectly	2: Administration	1: =or>90%	2	2: Minor	2: Unlikely	8 (M)	(L&R) legal & Regulatory	Investigate cable installation position mining damage from vehicles	Yes
		WO generated for 6 monthly set point audits to ensure and validate setpoints are correct.	2: Administration	1: =or>90%	2						
		VO CITECT audit completed monthly as part of the monthly ventilation survey	2: Administration	1: =or>90%	2						
		CITECT overview system – trending and set point screen	2: Administration	1: =or>90%	2						
		Citect password protected	2: Administration	1: =or>90%	2						
		Critical Controls to review the Gas Monitoring process	2: Administration	1: =or>90%	2						
		VO Authorisation for relocation/commissioning and removal of gas monitoring infrastructure – reg: 225.	2: Administration	1: =or>90%	2						
ERZC sign off required on gas monitoring Work orders		2: Administration	1: =or>90%	2							
25002 and 25003 Gas monitoring plans as maintained by VO.	2: Administration	1: =or>90%	2								
Sensor exposed >2.5% CH4 resulting in an HPI	LW automation and cutting cycles	4: Engineering	1: =or>90%	1	3: Moderate	3: Possible	13 (S)	(L&R) legal & Regulatory	LW TG Roadway sensor to be established with shearer automation triggers to mitigate risk of gas exceedence due to production make (Initially: 1.5% Activation, 1.9% Stop Haulage and 1.75% unlatch, subject to review as per Gas Monitoring SOP Setpoint Change Process). 2% for removing power to the AFC and shearer cutter motors	Yes	
	Fit for purpose equipment for designated ERZ classifications	4: Engineering	1: =or>90%	1							
	>35m ³ /s ventilation across the Longwall face	4: Engineering	1: =or>90%	1							
	TARP.001.PHMP.GTM.005.1 Gas Management TARP for triggers and response requirements when mining	2: Administration	1: =or>90%	2							
	Vertical post gas drainage boreholes every 50m along the TG roadway and every 100m along the MG roadway	4: Engineering	1: =or>90%	1							
	Inseam post gas drainage HGH/C2 and GL boreholes	4: Engineering	1: =or>90%	1							
	Gas Drainage plant capacity	4: Engineering	1: =or>90%	1							
UIS predrainage of seam	4: Engineering	1: =or>90%	1								

Sensor located in the incorrect position (Sensor does not comply with CMSH Reg 2017 requirements or PHMP.GTM.005 or Sensor does not detect representative General Body Measurements)	25002 and 25003 Gas monitoring plans as maintained by VO.	2: Administration	1: =or>90%	2	2: Minor	2: Unlikely	5 (L)	(L&R) legal & Regulatory	Ensure that sensor any TG roadway sensor relocation paperwork and second workings SOP states that sensor is not to be diluted by additional intake ventilation source (i.e. downcasting boreholes are isolated before retreating roadway sensor outbye)	Yes
	VO Authorisation for relocation/commissioning and removal of gas monitoring infrastructure – reg: 225.	2: Administration	1: =or>90%	2						
	Trained and authorised personnel (electricians) on gas monitoring system	2: Administration	1: =or>90%	2						
	ERZ controller inspections as per SOP.MP.GTM.019.306 Grasstree Mine Statutory Inspection Scheme to ensure gas monitors have been installed in the correct position	2: Administration	1: =or>90%	2						
Sensor damaged during TG works e.g.- installation of standing secondary support, LHD work, Drift runner	Trained and authorised personnel (electricians) on gas monitoring system	2: Administration	1: =or>90%	2	2: Minor	2: Unlikely	5 (L)	(BI/MD) Business Interruption, Material Damage and Other Consequential Loss	Ensure sensor is installed with reflective droppers to highlight sensor location in roadway.	Yes
	ERZ controller inspections as per SOP.MP.GTM.019.306 Grasstree Mine Statutory Inspection Scheme to ensure gas monitors have been installed in the correct position	2: Administration	1: =or>90%	2						
	Fit for purpose equipment for designated ERZ classifications	4: Engineering	1: =or>90%	1						
	Trained and Authorised operators for each piece of equipment	2: Administration	1: =or>90%	2						
Faulty sensor resulting in incorrect gas reading or recording	OEM supplied Gas system	2: Administration	1: =or>90%	2	2: Minor	3: Possible	8 (M)	(BI/MD) Business Interruption, Material Damage and Other Consequential Loss		Yes
	Calibration regime underlined by AS2290 3	2: Administration	1: =or>90%	2						
	Fit for purpose equipment for designated ERZ classifications	4: Engineering	1: =or>90%	1						
	Trained and authorised personnel (electricians) on gas monitoring system	2: Administration	1: =or>90%	2						
	Grasstree Work order system for maintenance and checks on all sensors	2: Administration	1: =or>90%	2						
	Introduction to site process	2: Administration	1: =or>90%	2						
	SOP.PHMP.GTM.005.1.249 Taking Action when Methane Detected at a Ventilation Split or Main Return Airway SOP.PHMP.GTM.005.1.250 Action to be Taken if Methane Detector Activates or is Non-Operational SOP.PHMP.GTM.005.1.252 Use of Portable Gas Detectors in Event of Failure or Non-Operation of Mine Gas Monitoring System providing the governing processes for reliable and compliant sensor installation	2: Administration	1: =or>90%	2						
Sensor installed	Gas calibrations which will highlight if setpoints have been installed incorrectly	2: Administration	1: =or>90%	2					Install gas sensor(s) to monitor TG sprocket gas levels (exact location of sensor(s) to be identified in VO authorisation approved by the UMM)	
	WO generated for 6 monthly set point audits	2: Administration	1: =or>90%	2					Review monitoring of TGD Sprocket sensor over 3 month period of 910LW extraction, and compare to TGD Motor sensors. If trending indicates GB consistent between the three sensors review/remove redundant sensors.	

Tailgate Drive Sprocket Sensor(s)	Sensor installed incorrectly (set points / location) and does not measure General Body concentration accurately resulting in >2.5% in the TG Roadway	VO CITECT audit completed monthly as part of the monthly ventilation survey	2: Administration	1: =or>90%	2	2: Minor	2: Unlikely	5 (L)	(L&R) legal & Regulatory	Install TGD Sprocket sensor(s) with the same setpoints at TG Motor sensors (s234A Alarm 1%, Trip 2% CH4)	Yes
		CITECT overview system – trending and set point screen	2: Administration	1: =or>90%	2						
		Citect password protected	2: Administration	1: =or>90%	2						
		Critical Controls to review the Gas Monitoring process	2: Administration	1: =or>90%	2						
		VO Authorisation for relocation/commissioning and removal of gas monitoring infrastructure – reg: s225	2: Administration	1: =or>90%	2						
		ERZC sign off required on gas monitoring Work orders	2: Administration	1: =or>90%	2						
		25002 and 25003 Gas monitoring plans as maintained by VO.	2: Administration	1: =or>90%	2						
		Sensor monitoring and reporting via Fibre providing better trending definition.	4: Engineering	2: 60 - 90%	2						
	Sensor exposed >2.5% CH4 resulting in an HPI	LW automation to control longwall shearer speed/movement as specified in the Gas Management TARP	4: Engineering	1: =or>90%	1	3: Moderate	3: Possible	13 (S)	(L&R) legal & Regulatory	Create automation logic to prevent TG Shield advance while shearer hauling to 'turn around point' when TG Roadway sensor >1.5% CH4 or TG Sprocket Sensor >0.6% CH4 as identified as a control to HPI events from 0m sensor HPI LFI outcomes (Initial set points - Changes permitted subject to review as per Gas Monitoring SOP Setpoint Change Process)	Yes
		fit for purpose equipment for designated ERZ classifications	4: Engineering	1: =or>90%	1						
		>35m ³ /s ventilation across the Longwall face	4: Engineering	1: =or>90%	1						
		TARP.001.PHMP.GTM.005.1 Gas Management TARP for triggers and response requirements when mining	2: Administration	1: =or>90%	2						
		Vertical post gas drainage boreholes every 50m along the TG roadway and every 100m along the MG roadway	4: Engineering	1: =or>90%	1						
Inseam post gas drainage GHG/C2 and GL boreholes	4: Engineering	1: =or>90%	1								
Gas Drainage plant capacity	4: Engineering	1: =or>90%	1								
UIS predrainage of seam	4: Engineering	1: =or>90%	1								

CORRECTIVE ACTION/TASK ASSIGNMENT REGISTER

It is the responsibility of the Facilitator to ensure this Risk Assessment is completed as per Coal Mining Safety & Health Regulation 2017 s10 (3).

If the Facilitator is not a person fulfilling a role on the Grasstree Organisational Structure. eg a Contractor not in an FTE role or a Consultant, the person must contact the Company Rep, relevant Manager or Person appointed under Coal Mining Safety & Health Act 1999, S 55 to review the Risk Assessment and Action Plan

Review #						
ACTION PLAN ID:				AP.000		
N ^o .	Task DETAILS <small>(must be clear about what is required and have unique identifier linked to Additional Actions)</small>	Task Hierarchy <small>(Low, Medium, High)</small>	Task Type <small>(Refer to Enablon)</small>	PERSON RESPONSIBLE	ANTICIPATED COMPLETION DATE	ENABLON TASK ID #
1	Enter all corrective actions / tasks into Enablon			Facilitator	Immediately post RA approval	NA
2	LW TG Dog Leg Sensor to be established with identical shearer automation triggers as the Tailgate Roadway sensor to mitigate risk of gas exceedence due to production make (Initially: 1.5% Activation, 1.9% Stop Haulage and 1.75% unlatch, subject to review as per Gas Monitoring SOP Setpoint Change Process)	Medium	Process review	James Moreby	1/06/2020	TS.01321282
3	Ensure LWTG sensor is established to meet the requirements of s243A of the CMSH Reg 2017	Medium	Process review	James Moreby	1/06/2020	TS.01321284
4	LW TG Roadway sensor to be established with shearer automation triggers to mitigate risk of gas exceedence due to production make (Initially: 1.5% Activation, 1.9% Stop Haulage and 1.75% unlatch, subject to review as per Gas Monitoring SOP Setpoint Change Process). 2% for removing power to the AFC and shearer cutter motors	Medium	Process review	James Moreby	1/06/2020	TS.01321287
5	Ensure that sensor any TG roadway sensor relocation paperwork and second workings SOP states that sensor is not to be diluted by additional intake ventilation source (i.e. downcasting boreholes are isolated before retreating roadway sensor outbye)	Medium	Process review	James Moreby	1/06/2020	TS.01321289
6	Ensure sensor is installed with reflective droppers to highlight sensor location in roadway.	Medium	Process review	James Moreby	1/06/2020	TS.01321291
7	Install gas sensor(s) to monitor TG drive gas levels (exact location of sensor(s) to be identified in VO authorisation approved by the UMM)	Medium	Process review	James Moreby	1/06/2020	TS.01321292
8	Review monitoring of TGD Sprocket sensor over 3 month period of 910LW extraction, and compare to TGD Motor sensors. If trending indicates GB consistent between the three sensors review/remove redundant sensors.	Medium	Process review	James Moreby	1/06/2020	TS.01321296
9	Install TGD Sprocket sensor(s) with the same setpoints at TG Motor sensors (s234A Alarm 1%, Trip 2% CH4)	Medium	Process review	James Moreby	1/06/2020	TS.01321297

10	Create automation logic to prevent TG Shield advance while shearer hauling to 'turn around point' when TG Roadway sensor >1.5% CH4 or TG Sprocket Sensor >0.6% CH4 as identified as a control to HPI events from 0m sensor HPI LFI outcomes (Initial set points - Changes permitted subject to review as per Gas Monitoring SOP Setpoint Change Process)	Medium	Process review	Mick Seay	1/06/2020	TS.01321299
11	Ensure sensor installed on TGD Carport is protected to prevent failure in operation (protect from moisture and coal build up).	Medium	Process review	James Moreby	1/06/2020	TS.01321300
12	Investigate 'sniffer' type sensor for TG Sprocket installation to protect unit from damage.	Medium	Process review	James Moreby	1/06/2020	TS.01321302
13	Install gas sensor(s) to monitor TG drive gas levels (exact location of sensor(s) to be identified in VO authorisation approved by the UMM)	Medium	Process review	James Moreby	1/06/2020	TS.01321303
14	VO authorisation for installing/relocating the LW TG roadway sensor to include requirement for a pogo to demarcate the TG roadway sensor	Medium	Process review	James Moreby	1/06/2020	TS.01321306

Anglo American Plc Risk Matrix		Hazard Effect / Consequence (Where an event has more than one 'Loss Type', choose the 'Consequence' with the highest rating)				
Loss Type (Additional 'Loss Types' may exist for an event; identify & rate accordingly)		1 Insignificant	2 Minor	3 Moderate	4 High	5 Major
(S/H) Harm to People (Safety / Health)		First aid case / Exposure to minor health risk	Medical treatment case / Exposure to major health risk	Lost time injury / Reversible impact on health	Single fatality or loss of quality of life / Irreversible impact on health	Multiple fatalities / Impact on health ultimately fatal
(EI) Environmental Impact		Minimal environmental harm – L1 incident	Material environmental harm – L2 incident remediable short term	Serious environmental harm – L2 incident remediable within LOM	Major environmental harm – L2 incident remediable post LOM	Extreme environmental harm – L3 incident irreversible
(BI/MD) Business Interruption / Material Damage & Other Consequential Losses		No disruption to operation/5% loss of budgeted operating profit	Brief disruption to operation 10% loss of budgeted operating profit/listed assets	Partial shutdown / 15% loss of budgeted operating profit/listed assets	Partial loss of operation 20% loss of budgeted operating profit/listed assets	Substantial or total loss of operation / 25% of loss budgeted operating profit/listed assets
(L&R) Legal & Regulatory		Low level legal issue	Minor legal issue; non compliance and breaches of the law	Serious breach of law; investigation/report to authority, prosecution and/or moderate penalty	Major breach of the law; considerable prosecution and penalties	Very considerable penalties & prosecutions. Multiple law suits & jail terms
(R/S/C) Impact on Reputation / Social / Community		Slight impact - public awareness may exist but no public concern	Limited impact - local public concern	Considerable impact - regional public concern	National impact - national public concern	International impact - international public attention
Likelihood	Examples (Consider near-hits as well as actual events)	Risk Rating				
5 (Almost Certain)	The unwanted event has occurred frequently; occurs in order of one or more times per year & is likely to reoccur within 1 year	11 (M)	16 (S)	20 (S)	23 (H)	25 (H)
4 (Likely)	The unwanted event has occurred infrequently; occurs in order of less than once per year & is likely to reoccur within 5 years	7 (M)	12 (M)	17 (S)	21 (H)	24 (H)
3 (Possible)	The unwanted event has happened in the business at some time; or could happen within 10 years	4 (L)	8 (M)	13 (S)	18 (S)	22 (H)
2 (Unlikely)	The unwanted event has happened in the business at some time; or could happen within 20 years	2 (L)	5 (L)	9 (M)	14 (S)	19 (S)
1 (Rare)	The unwanted event has never been known to occur in the business; or it is highly unlikely that it will occur within 20 years	1 (L)	3 (L)	6 (M)	10 (M)	15 (S)

Risk Rating	Risk Level	Guidelines for Risk Matrix
21 to 25	(H) – High	A high risk exists that management's objectives may not be achieved. Appropriate mitigation strategy to be devised immediately.
13 to 20	(S) – Significant	A significant risk exists that management's objectives may not be achieved. Appropriate mitigation strategy to be devised as soon as possible.
6 to 12	(M) – Medium	A moderate risk exists that management's objectives may not be achieved. Appropriate mitigation strategy to be devised as part of the normal management process.
1 to 5	(L) – Low	A low risk exists that management's objectives may not be achieved. Monitor risk, no further mitigation required.

Control Effectiveness Tool				
Control Category / Effectiveness	= or >90%	60 – 90%	30 – 60%	< 30%
PPE	3	3	3	3
Admin	2	2	3	3
Separation	1	2	3	3
Engineering	1	2	3	3
Substitution	1	2	3	3
Elimination	1	2	3	3