



Trigger Action Response Plan

Title GRO-750-TARP-General Body Contaminant
Name GRO-750-TARP-General Body Contaminants

HAZARD - FIRE, EXPLOSION, IRRESPIRABLE ATMOSPHERE, GENERAL BODY CONTAMINATED WITH GASES AND SMOKE

TRIGGER AND RESPONSE		Normal	Level 1	Level 2	Level 3	
GENERAL BODY CONCENTRATIONS	Methane	NERZ	CH ₄ less than 0.25 %	CH ₄ greater than 0.25% and less than 0.50%	CH ₄ 0.5% (NERZ/ERZ1 power trip)	
		Development & Mains Return	CH ₄ less than 1.25%	CH ₄ greater than 1.25% and less than 2.0%	CH ₄ greater than 2.0% and less than 2.5%	CH ₄ equal to or greater than 2.5%
		Longwall Return	CH ₄ less than 2.0%	CH ₄ greater than or equal to 2.0% and less than 2.20% for a continual period (i.e. not a sudden or temporary increase caused by a goaf fall)	CH ₄ greater than or equal to 2.20% and less than 2.5% for a continual period (i.e. not a sudden or temporary increase caused by a goaf fall)	CH ₄ equal to or greater than 2.5% for a continual period (i.e. not a sudden or temporary increase caused by a goaf fall)
		Upcast shaft (measured in the shaft)	CH ₄ less than 0.5%	CH ₄ equal to or greater than 0.5% and less than 1.5%	CH ₄ equal to or greater than 1.5% and less than 2.0%	CH ₄ equal to 2.0% - Trip Underground Power
	Diesel equipment	CH ₄ less than 1.0%	CH ₄ equal to or greater than 1.0% and less than 1.25%	CH ₄ equal to or greater than 1.25%	CH ₄ equal to or greater than 2.5%	
	Carbon Monoxide	Development return	CO < 5 ppm	5ppm< CO < 20 ppm	20ppm< CO< 30 ppm	> 30 ppm
		Longwall Return	<i>Refer to Active goaf TARP (GRO-6953) longwall return</i>			
	Hydrogen sulphide		< 2 ppm	2 – 5 ppm	5 – 10 ppm	> 10 ppm
	Carbon Dioxide		< 0.5 %	0.5 – 1.0 %	1.0 – 1.25 %	> 1.25 %
	Nitrogen Dioxide		< 1 ppm	1 – 2 ppm	2 – 3 ppm	> 3 ppm
Oxygen		20 – 20.9 %	20 - 19.5 %	19.5 - 19.0 %	< 19.0 %	
Physical Indicators		Clear atmosphere, no unusual smell	Reports of smoke, burning smell, haze	Smoke haze in intake air	Smoke clearly visible	
Underground Personnel		<ul style="list-style-type: none"> Maintain a safe productive shift operating within Standard Procedures and Work Instructions. 	<ul style="list-style-type: none"> Report any unusual conditions (smell, heat effects) to ERZ Controller. Withdraw diesel equipment in atmosphere equal to or greater than 1.0% CH₄ and less than 1.25% 	<ul style="list-style-type: none"> Immediately report any unusual conditions to the ERZ Controller & notify CRO. Immediately shut down diesel equipment in atmosphere containing >1.25% CH₄. 	<ul style="list-style-type: none"> All persons to cease activities in affected area. All persons to immediately withdraw from affected area (Tailgate or return roadway), until advised by a mine official. 	
Control Room Operator		<ul style="list-style-type: none"> Routinely monitor gas monitoring systems and gas plant operation as part of normal control room duties. Acknowledge and validate gas monitoring and goaf plan alarms as required. 	<ul style="list-style-type: none"> As per Normal; and Notify ERZ Controller for Zone. Notify Undermanager. Cross-check and validate with tube bundle monitoring (if installed). 	<ul style="list-style-type: none"> As per Level 1; and Liaise with LW ERZ Controller to provide information based on recent trending of TG Methane Levels (determine shear by shear increase in methane levels). 	<ul style="list-style-type: none"> As per Level 2; and Monitor gas trend in affected area and notify Undermanager if trend continues to increase. 	

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13	29/01/2019	Trent Griffiths – Technical Services Manager	Wouter Niehaus - UMM	Wouter Niehaus – UMM Marc Kirsten – SSE / GM
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	<ul style="list-style-type: none"> Log all gas alarms in the gas alarm register. 	<ul style="list-style-type: none"> Record any actions taken by ERZC in gas alarm log. Monitor gas trends. <p>Additionally for Longwall Return:</p> <ul style="list-style-type: none"> Notify Seamgas Technician. Review gas plant operation on citect page to identify and alarms or faults. Review longwall gas monitoring trends accordingly. Monitor and provide updates on goaf drainage system status. Increase environmental monitoring for changes in affected area (display real time continuous trend of Longwall return on a control room screen). 	<ul style="list-style-type: none"> Notify Ventilation Officer. Notify Underground Mine Manager. 	<ul style="list-style-type: none"> Provide continual updates of underground activities in relation to the TARP as directed by the IMT.
Longwall Maingate Operator (for Longwall Return Continual Period Methane Levels Triggers)	<ul style="list-style-type: none"> Maintain a safe productive shift operating within Standard Procedures and Work Instructions. 	<ul style="list-style-type: none"> As per Normal. Confirm that the shearer haulage speed has been reduced by 30% and inform ERZ Controller. 	<ul style="list-style-type: none"> As per Level 1, and; Confirm that the shearer haulage has tripped and inform ERZ Controller. 	<ul style="list-style-type: none"> Confirm the shearer power has tripped (if methane levels are equal to or greater than 2.5% in the TG roadway) irrespective of where the shearer is on the LW face. Notify the ERZ Controller.
ERZ Controller	<ul style="list-style-type: none"> Maintain routine inspections in accordance with ERZ Inspection Schedule. 	<ul style="list-style-type: none"> Investigate cause of change and check section ventilation. Make repairs or modifications as required. Complete corrective actions to rectify problem from reoccurring. Record event and actions taken in statutory report. Pass on information to oncoming shift. Communicate findings and action with CRO Ensure affected diesel equipment is withdrawn to fresh air. <p>Additionally for Longwall Return:</p> <ul style="list-style-type: none"> As per Normal. Ensure TG ventilation flaps / sails are installed as per the standard. Confirm the shearer haulage speed has been reduced by 30%. 	<ul style="list-style-type: none"> Communicate with CRO and Undermanager. Investigate cause of change and check section ventilation. Make repairs or modifications as required. Complete corrective actions to rectify problem from reoccurring as directed by IMT Record event and actions taken in statutory report. Pass on information to oncoming shift. Ensure affected diesel equipment is shutdown immediately. <p>Additionally for Longwall Return:</p> <ul style="list-style-type: none"> As per Level 1. Confirm that the shearer haulage has tripped. Notify the Undermanager of the reason the Shearer is required to be moved and to where the Shearer is to be moved too. Inspect atmosphere as close as possible on the return side of the TG drum to confirm <2.20% so that the shearer can be moved to minimise goaf flushing or to a place of safety. Communicate outcomes of IMT to LW crew. 	<ul style="list-style-type: none"> Withdraw personnel from affected area until directed by IMT (to surface in case of upcast shaft). Communicate with CRO and shift Undermanager Conduct further investigation and implement corrective action as directed by Undermanager and in consultation with IMT. Complete corrective actions to rectify problem. Record event and actions in statutory report. Pass on information to oncoming shift. <p>Additionally for Longwall Return:</p> <ul style="list-style-type: none"> As per Level 2 and; Ensure the shearer power has tripped (if methane levels are equal to or greater than 2.5% in the TG roadway) irrespective of where the shearer is on the LW face.
Undermanager	<ul style="list-style-type: none"> Maintain a safe productive shift operating within Standard Procedures and Work Instructions. 	<ul style="list-style-type: none"> Investigate cause and review corrective actions to rectify problem. Record events in shift report. Pass on information to oncoming shift. 	<ul style="list-style-type: none"> Monitor Gas trends in main fans and panel returns. Investigate cause and review corrective actions to rectify problem. Record event in shift report. 	<ul style="list-style-type: none"> Ensure personnel have been withdrawn from affected area and inform IMT leader. Investigate cause and review corrective actions to rectify problem.

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			<ul style="list-style-type: none"> Pass on information to oncoming shift. Review production rates for longwall. Participate in IMT (Lead IMT in absence of UMM). Review any request to move the Shearer and give approval if satisfied that it is safe to move the Shearer to the safe location. Ensure IMT Meeting Minutes are communicated to all CMW's. 	<ul style="list-style-type: none"> Monitor Gas trends in main fans and panel returns. Record event in shift report. Pass on information to oncoming shift. Participate in IMT.
Seamgas Technician	For Longwall Return: <ul style="list-style-type: none"> Commission and decommission well surface connections and monitoring as required by operations. Manage surface reticulation system routine maintenance. (e.g. dewatering, flame arrestor). Run weekly bag sample(s) for goaf wells as required by Ventilation Officer. Review and maintain goaf well data base for hole performance. 	For Longwall Return: <ul style="list-style-type: none"> As per Normal; and; Notify CRO of TARP trigger. Investigate cause of TARP trigger and put reasonable measures in place to rectify. Notify Shift Undermanager of actions taken and record actions in shift report. Ensure PGD manual monitoring and bag sampling is conducted as per Level 1 responses. Analyse data and provide status updates to CRO and UM. Review available gas data relating to Goaf drainage individual wells and the plant. Take appropriate measures to rectify problems reported with the goaf drainage system. Verify LW face position and check if next available goaf well can be activated. Conduct a physical check on goaf infrastructure, hole gas flows and gas composition. Mitigate methane purity out of well / riser via amending pressure and flow as required. Investigate methods to further increase Goaf drainage or UIS capacity (e.g additional venturi's to supplement Gas Plant). 	For Longwall Return: <ul style="list-style-type: none"> Develop action plan to optimise goaf drainage system performance and immediately communicate with UM. Ensure resources are provided to expedite any surface goaf drainage system work as directed by UM and VO. Report all rectification measures taken to CRO and UM. Notify UM and VO of status and action taken and any changes made. Take appropriate measures to rectify problems reported with the gas drainage system Conduct physical checks as detailed in level 1 response Investigate potential to increase capacity (e.g. are there any additional venturi's available, can we increase suction on the plant etc.) 	For Longwall Return: <ul style="list-style-type: none"> As per level 2.
Seamgas Superintendent or Delegate	For Longwall Return: <ul style="list-style-type: none"> Provide assistance to Seamgas Technician. 	For Longwall Return: <ul style="list-style-type: none"> As per Normal; and; Investigate cause of TARP trigger and propose recommendations to Seamgas Technician 	For Longwall Return: <ul style="list-style-type: none"> As per Level 1; and; Participate in IMT. 	For Longwall Return: <ul style="list-style-type: none"> As per Level 2; and; Participate in IMT.
Ventilation Officer	<ul style="list-style-type: none"> Regularly review Environmental Monitoring System performance. Provide a report on a weekly basis to the weekly Ventilation and Gas Meeting with the UMM showing 7 day rolling trends of the TG dogleg methane sensor, inbye TG methane sensor, barometric pressure and 	As per Normal; and; <ul style="list-style-type: none"> Review and validate the cause of the Level 1 gas event within a 24 hour period and advise on corrective actions. Advise and implement any further preventative actions. Identify potential failures and hazards. 	As per level 1; and; <ul style="list-style-type: none"> Review and validate the cause of the Level 2 gas event as soon as practicable within the shift. Advise and implement any further preventative actions, including optimisation of gas drainage infrastructure or the ventilation network. 	<ul style="list-style-type: none"> Review and validate the cause of the Level 3 gas event as a priority task. Advise and implement any further preventative actions. Identify potential failures and hazards. Participate in IMT.

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		goaf gas capture flow rates overlaid with LW tonnes produced.	<ul style="list-style-type: none"> Confirm that the correct action has been taken. Verify that the ventilation system is healthy. Review potential to increase Longwall Split Ventilation quantity for dilution. Review barometer trend and forecast. Confirm ventilation and gas drainage are consistent. Communicate findings to Seamgas Superintendent, Undermanager and UMM Record the operational, ventilation and gas drainage scenarios for review/investigation. 	<ul style="list-style-type: none"> Identify potential failures and hazards. Participate in IMT. For a genuine NERZ trip of greater than 0.5% CH₄ then review the risk assessment for establishing NERZ / ERZ 1 zoning with relevant cross section of the workforce 	
	Underground Mine Manager	<ul style="list-style-type: none"> Regularly review Environmental Monitoring System performance and ERZ Statutory Reports. 	<ul style="list-style-type: none"> Review incidents and ensure corrective actions are implemented to rectify problem. 	<ul style="list-style-type: none"> Initiate and lead IMT. Approve any changes to shearer haulage speeds whilst IMT is in progress. Review Level 2 gas events and ensure corrective and preventative actions are implemented to rectify problem. Notify the Site Senior Executive. 	<ul style="list-style-type: none"> Review Level 3 gas events and ensure corrective and preventative actions are implemented to rectify problem. Lead IMT.
	Site Senior Executive				<ul style="list-style-type: none"> Monitor and review as required. Provide external notifications as required. Participate in IMT.
<p>*** Clarifying Information:</p> <ol style="list-style-type: none"> Upcast shaft refers to gas monitoring at the shaft collar which monitors the air running through the main fans. Affected area means the place where the trigger is identified and the immediate return of the affected area where the trigger level would be maintained. All samples are to be verified as soon as is reasonably possible. Methods of sample verification include and are not limited to the following; <ol style="list-style-type: none"> Collecting additional bag samples and re-analysing Bag samples to be analysed with gas chromatograph if required to confirm higher hydrocarbons Utilisation of a second Gas Chromatograph to re-run bag samples, including use of a third party to verify results <p>Triggers are based on raw measurements and not air free analysis</p> <ol style="list-style-type: none"> The LW Tailgate Return Roadway has a General Body Methane sensor at the Dogleg and also one maintained approximately 400 metres outbye of the LW face. The inbye sensor is set to interact with the LW face, slowing and stopping shearer haulage and tripping power to shearer as per the "TG Roadway" requirements outlined in the TARP above. The outbye sensor will be set to trip power to the shearer as per the Level 3 Trigger requirements. 					

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