Resources Safety & Health
Queensland

Level 1 emergency exercise report

Exercise date: Tuesday 26 October 2021

Exercise location: Oaky North Coal Mine

Report author: Geoff Nugent, Inspector of Coal Mines &
Chair 2021 State Emergency Exercise

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Abbreviations and glossary

Term	Definition
Approved standard	A standard made for safety and health under the repealed *Coal Mining Safety and Health Act 1925* stating ways to achieve an acceptable level of risk to people arising out of coal mining operations
CABA	Compressed air breathing apparatus
CPR	Cardio pulmonary resuscitation
CH_4	Methane
CITECT	Brand name of SCADA system
CO	Carbon monoxide
CO_2	Carbon dioxide
CMW	Coal mine worker
Continuous miner (CM)	Coal cutting machine used to develop new roadways in a mine
crib room	Location where mineworkers eat and a meeting station for the ERZ controllers
CRO	Control room operator
Cut-through (ct)	A passage cut through the coal, connecting two parallel headings
DAC	Direct audio communications Underground intercom system also referred to as the *tannoy*
Deputy	Safety supervisor who makes statutory inspections not referred to as an ERZ controller in Queensland regulation
Drift runner	Brand name for a flameproof diesel powered man-riding vehicle carrying up to 12 personnel. Sometimes interchanged with PJB which is a different brand.
Downcast	Shaft of bore hole where air enters the mine. Sometimes referred to as an intake shaft.
Eimco	Brand name of a flameproof diesel powered mechanical loader. Can be referred to as a load haul dump (LHD) machine
ERZ	Explosion risk zone
ERZC	Mine worker responsible for safety inspections traditionally referred to as a Deputy
Face	The exposed surface of a coal deposit in the working place where mining is proceeding
Fresh air base (FAB)	A continuously monitored station for dispatch or return of rescue teams in close proximity to irrespirable zones
Gas chromatograph (GC)	A laboratory instrument used to analyse the composition of gas samples
Go line	An assembly area on the surface where mobile plant is left after servicing and when available for use
HMP	Hazard management plan

IAP	Incident action plan—developed by the IMT and signed off so that each of the teams, logistics, operations and planning have clear direction
IC	Incident Controller – Most senior person in the IMT
IMT	Incident Management Team (term is interchangeable with ICT)
Inbye	Mining term for going into the underground mine (away from the surface) from the point of reference
Industry Safety and Health Representative (ISHR)	A person who is appointed under section 109(1)5 of the *Coal Mining Safety and Health Act 1999* to represent coal mine workers on safety and health matters and who performs the functions and exercises the powers of an industry safety and health representative mentioned in part 8, division 2
Intake (roadway)	A name or fresh air as defined in the coal mine regulations
Loader	diesel powered mechanical loader. Can be referred to as a load haul dump (LHD) machine
Level 1 mine emergency exercise	State level mine emergency exercise recommended in the Moura inquiry, designed to test the mine's emergency response system; test the ability of external services to administer assistance; and provide a focal point for emergency preparedness in the state
Longwall	A method of mining flat-bedded deposits, in which the working face is retreated over a considerable width at one time
Mines Inspector	Official employed to make examinations of, and to report upon, mines and surface plants for compliance with mining laws, rules and regulations, safety methods
Mines Inspectorate	The organisation which controls the mines inspectors
MEMS	Mine Emergency Management System
MRAS	Mine Re-entry Assessment System
Mole	Name used to refer to the mine site representative on the organising committee for the level 1 mine emergency exercise
Non-verbal communication	Method of communicating using beeps on a telephone or DAC similar to Morse code
O_2	Oxygen
OCN	Oaky Creek North Coal Mine
Outbye	Mining term for out of the underground mine (towards the surface) from the point of reference
Panel	The working of coal seams in separate panels or districts, e.g. single unit panel—a longwall face is sometimes referred to as a panel
Personal emergency device (PED)	Ultra-low frequency through-the-earth communication system used for paging—originally developed to provide a fast and reliable method of informing underground miners of emergency situations
DESM	Deep South East Mains

Portal	The surface entrance to an underground mine
ppm	Parts per million
QMRS	Queensland Mines Rescue Service
Recognised standard	A standard made for safety and health under the *Coal Mining Safety and Health Act 1999* stating ways to achieve an acceptable level of risk to people arising out of coal mining operations
Return (Roadway)	Name for air that has ventilated a working face often contaminated with heat, dust and gases
Rib	The solid coal on the side of a gallery or longwall face; a pillar or barrier of coal left for support
Safegas	Brand name of a mine gas monitoring system (developed by Simtars)
Self-contained self-rescuer (SCSR)	A respiratory device used by miners for the purpose of escape during mine fires and explosions—it provides the wearer a closed-circuit supply of oxygen for periods of time usually less than 1 hour
Simtars	Safety in Mines Testing and Research Station
Stopping	A ventilation control device which stops ventilation flow through a roadway
Turbex™ (Foam Generator)	A water powered firefighting device (dimensions 902W x 927H x 495D Nett wt.55kg) designed to produce large capacities of high expansion foam, up to 200 cubic metres per minute
Tag board	Peg board where underground personnel place a token to indicate their presence in a section of the mine
Undermanager	Mineworker who is in charge of the mine on a shift basis (i.e. shift supervisor)
Upcast	Shaft of borehole where the air leaves the mine. Sometimes referred to as a return shaft
Ventsim™	Ventilation modelling software
VCD	Ventilation control device—an air door, stopping, seal or brattice
VO	Ventilation Officer—person responsible for coordination of all ventilation related activities at the mine including running a computer base ventilation modelling system

Preface

This report has been compiled by the State Emergency Exercise Executive Management Committee, under the guidelines provided in *Recognised Standard 8, Conduct of Mine Emergency Exercises*. Assessors have provided an account of their part of the exercise for this report. Each assessor's full timeline of events is available in the appendices.

The committee would like to thank all assessors for their input and acknowledge the co-operation and assistance of all those involved in the 2021 Level 1 Mine Emergency Exercise. In addition, the committee would also like to thank Oaky North Coal Mine for participating in the exercise and providing self-contained self-rescuers (SCSRs) and compressed air breathing apparatus (CABA) for use during the exercise, adding to the reality of the experience for evacuating coal mine workers.

Executive summary

This report covers the 2021 Level 1 Mine Emergency Exercise at Oaky North Coal Mine for the period from 01:00 to 14:30 on Tuesday 26 October 2021.

Oaky North Coal Mine is an underground longwall mine producing premium hard coking coal that is in Central Queensland's Bowen Basin, 90 kilometres north-west of Emerald and 46 kilometres south-west of Middlemount. (See Figure 1).

In all, 35 assessors took part in the exercise, with representatives from Oaky North Coal Mine, Simtars, Resources Safety and Health Queensland's Mines Inspectorate, Queensland Mines Rescue Service (QMRS), an industry safety and health representative (ISHR) from the Construction, Forestry, Mining and Energy Union, Minerals Industry Safety and Health Centre, Office of the Commissioner for Resources Safety and Health, Anglo Coal head office and mine staff, from Kestrel, Grosvenor, Broadmeadow, Aquila, Carborough Downs coal mines. This report contains several writing styles and each input has been reviewed and edited to provide a consistent theme.

The exercise was run late in the year due to restrictions related to COVID–19, which also prevented the involvement of assessors from New South Wales mines rescue service.

Scenario

The scenario was based on an underground fire in the mine's main intake (East Mains B heading 12ct) necessitating the evacuation of inbye coal mine workers to a place of safety. The incident occurred at 0100hrs.

Two loader drivers were injured during the incident (a collision of both vehicles) and required first aid assistance. A fire initiated on a loader engulfing the diesel pod it was carrying, then spreading to the second loader. This initiated an evacuation of coal mine workers (CMWs) from the areas affected by smoke from the fire and a firefighting response including application of the Turbex™ foam generator by CMWs outbye of the fire.

Escaping CMWs were confronted with decisions for alternate means of self and assisted escape because of the variability of smoke and contaminates in the main intakes, due to downcast shafts creating zones of fresh air. Two crews self-escaping each had an incapacitated crew member and had to determine an appropriate aided escape option for the CMW.

Immediate in-situ response

At East Mains (EM) 52 cut through (ct) D intersection a distinct air split existed with fresh air ventilating D heading from a downcast shaft at EM D 36ct and contaminated air (including smoke) reporting from B heading where the CABA refill stations are located. All escaping crews egressed via D heading in fresh air.

Continued egress at EM 33ct intake airways B, C and D was unsafe with zero visibility due to smoke. Options for escaping CMWs included continue self-escape on foot via A heading return or remain at a fresh air location inbye. All escaping CMWs choose to continue self-escape via A heading.

One crew (Deep South East Mains) with an incapacitated CMW carried the CMW in a stretcher from East Mains 33ct via A heading while wearing CABA. After travelling approximately 200m in A heading it was apparent to assessors' that risk would become unacceptable if the crew continued therefore assessors discontinued the stretcher carrying activity.

The second crew with an incapacitated CMW (Maingate 705 Development) positioned the CMW at a CABA refill station in East Mains 33ct B-C to sustain him until an effective aided escape could be provided by either inseam response or Mines Rescue deployment.

Longwall 704 crew initially considered egress via an alternate route to the primary escapeway. Because there was a known downcast shaft providing fresh air inbye the last open cut through (LOC), the crew initially travelled inbye (into fresh air) where a CABA refill station and phone was located at 31ct. After discussing the self-escape strategy with the Undermanager, on the surface, the ERCZ and crew decided to egress via the primary escapeway.

Underground emergency responders

Outbye CMWs responded rapidly to the incident scene at EM B heading effectively treating the two injured operators and transporting them to the surface.

The firefighting response was efficient, progressing the firefighting tactics from initial application of water to low expansion foam escalating to hi expansion foam applied with the Turbex™ foam generator. Firefighting activities continued until approximately 0600hrs when a fire watch was established. Contaminates from the remnant fire caused unacceptable environmental conditions for CMWs inbye the incident location.

Queensland Mines Rescue Service

The Incident Controller requested QMRS be placed on standby at 0225hrs and initiated a full QMRS team member response at 0355hrs.

QMRS deployed one Operations Manager to the incident after the request to be placed on standby. A second Operations Manager was not deployed to site during the incident response.

The QMRS team member response after 0355hrs was effective, along with the Operations Manager, within 2 hours of activation there were 1 x QMRS trainer, 1 x QMRS technician, 14 x Team members, 1 x QMRS equipment trailer on site.

A Mines Rescue response was required to provide aided escape to the CMW worker positioned at East Mains 33ct B-C. A risk-based approach was attempted by the mine and QMRS to prepare a plan for the deployment of mines rescue teams to provide aided escape.

However, the QMRS Mine Emergency Management System (MEMS) risk management process was not completed. Assessors noted the deployment of one Operations Manager significantly impacted the effectiveness of the QMRS risk management process.

Granting the risk management process had not been completed for QMRS teams to enter past the incident location, for the purpose of the exercise two mines rescue teams were deployed.

The deployment process and mines rescue operational activities underground were executed to a high standard. The mines rescue teams recovered the incapacitated CMW, delivering the CMW to the Fresh Air Base (FAB) at 1055hrs.

Incident Management Team (IMT)

The establishment of the Incident Management Team (IMT) and its functional areas commenced at approximately 0225hrs. Clear objectives were set, and leaders of the Planning, Operations and Logistics groups were appointed, and teams formed.

A high level of technical knowledge and competence was demonstrated within all groups. A factor which disadvantaged effective communication of critical information and data between IMT groups, including the Control Room, was the absence of an electronic emergency information management system with a capability provide information, actions, and data in real time.

The Ventilation Officer (VO) had a significant workload running ventilation models, analysing gas results, providing information to QMRS, developing ventilation options for IMT and numerous other tasks. A lack of sufficient support for the VO affected timeliness of data and information for the IMT to effectively monitor risk for CMWs to remain underground.

The responding Inspector of Mines (IOM) and industry safety and health representative (ISHR) attended the mine and were briefed in a room separate to the incident management team room.

The attending IOM also concluded that the required risk management process for deployment of mines rescue teams was insufficient and concurred with the Incident Controller that authorisation for deployment inbye the incident could not be granted when initially requested.

Recommendations

For the complete list of recommendations refer to page 48. The major recommendations made by

the 35 assessors can be grouped into four categories as follows:

Information and data management

- Review the effectiveness of information and data management in the event of an emergency including:
    - Electronic recording information from underground when reported to the control room and the ability for the information to be accessed in real time by the IMT and other functional areas.
    - Review the resourcing of the control room, both people and technology, during an emergency with a view to establishing the control room as an effective intelligence unit providing reliable and timely information to the IMT.
    - Consider risk and the erosion factors to environmental monitoring system and whether the mine captures TARP actions to be implemented if gas sensors have reached maximum capacity (as in this exercise all flat lined) to ensure accurate data is gathered to inform decision making and assurance it is safe for CMWs to remain underground or fighting a fire underground.
    - Implement a computerised incident management system to facilitate the communication of information and actions across all functional areas of the Incident Management Structure.
- All underground coal mines to review their SHMS to determine if controls and risk management processes provide for an acceptable level of risk to enable CMWs to remain underground to respond to an emergency.
- All underground coal mines to ensure that their SHMS includes information and data requirements that support the QMRS risk management processes for Mines Rescue services.
- All underground mines review the effectiveness of triggers for the initiation of a Mines Rescue response and take into consideration potential response times and contingencies for resources before an incident escalates.

Self-escape

- All underground coal mines should ensure the following elements are integrated into self-escape training for CMWs. Training should include:
    - training in the underground environment in simulated restricted visibility, including donning and changeover of breathing apparatus.
    - varied practical self-escape scenarios underground in self-escape training, including walking via alternate escape routes.
    - varied physical activities when wearing breathing apparatus during self-escape

training to provide experience and knowledge for CMWs to understand their physical and equipment limitations.

  - more regular desktop exercise analysis with diverse scenarios during self-escape training, including potential aided escape situations for incapacitated crew members.
  - testing CMWs ability to self -escape without the assistance of the ERZC in self-escaping training.

- All underground coal mines should review the strategy of refuge for CMWs where self-escape or assisted escape from a mine is unachievable during an emergency.

First response

- Ensure basic firefighting training includes the use of firefighting equipment for all classes of fire and the best medium to fight them.
- Ensure the potential ramifications of using high expansion foam without modelling the outcome is understood
- Conduct simple first aid scenarios regularly within groups to help people deal with incidents including more regular familiarisation with provided equipment.

Queensland Mines Rescue Service (QMRS)

- QMRS should review the effectiveness of deployment procedures for Operations Managers when notified of an emergency at a mine that may require the response of their rescue team members.
- QMRS should review the resourcing requirements required during an emergency at a mine to effectively apply the defined risk management process for their rescue teams to deploy and remain underground.
- Further, QMRS should review the resourcing requirements to efficiently deliver rescue team deployment procedures and relevant information during an emergency response at a mine e.g., Captains Task Sheets, Gas monitoring data and TARP status, Authority to enter.
- QMRS should conduct a review or audit for each underground coal mine to determine if the operational procedures developed by QMRS can be effectively applied to carry out rescue services at the mine
- QMRS to review the ALERTS communication system, to identify improvement opportunities. Feedback from several rescue team members indicated some had difficulty with responding to the ALERTS callout, including contacting personnel on the designated contact number.
- QMRS and Mines Rescue Coordinators to identify, and regularly communicate to all team members, the requirements and expectations on where and how to access each mine site

when responding to an emergency or planned exercise. Some delays were experienced by rescue team members accessing the mine site.

Geoff Nugent

Chair 2021 State Emergency Exercise Executive Committee

Figure 1 Location Map for Oaky North

Introduction

This report covers the 2021 Level 1 Mine Emergency Exercise at Oaky North Coal Mine for the period from 01:00 to 14:30 on Tuesday 26 October 2021. Oaky North Coal Mine is an underground longwall mine producing premium metallurgical coal and is in Central Queensland's Bowen Basin, 90 kilometres north-west of Emerald and 46 kilometres south-west of Middlemount (see Figure 1).

The Queensland Mining Warden's inquiry into the explosion at the Moura No. 2 mine in August 1994 recommended, "emergency procedures should be exercised at each mine on a systematic basis, the minimum requirement being on an annual basis for each mine" (Windridge et al 1996).

In December 1996, the *Approved Standard for the Conduct of Emergency Procedures Exercises* was published. This approved standard was updated and issued as *Recognised Standard 8 Conduct of Mine Emergency Exercises* (RS8) in June 2009. It provides guidelines for conducting mine site emergency exercises, including the requirement to test state-wide emergency responses by holding an annual exercise at an underground mine.

It is 27 years since the Moura No 2 disaster, and 11 years since the Pike River disaster in New Zealand. The Pike River Royal Commission outcomes led New Zealand to adopt similar legislation regarding emergency exercises.

Since 1998, 24 Level 1 mine emergency exercises have been held at coal mines in Queensland.

Objectives

The objectives of the exercise were set using the requirements of RS8 and by reviewing previous exercise reports. The objectives were to test:

- the ability of coal mine workers (CMWs) to self-escape
- mine site incident response
- the ability for triage of injured CMW
- donning of self-contained self-rescuers (SCSR) and the changeover to compressed air breathing apparatus (CABA)
- interaction with industry safety and health representative (ISHR) and the Queensland Mines Inspectorate
- mobilisation of Queensland Mines Rescue Service (QMRS), risk assessment process for the mine re-entry, the establishment of a fresh air base (FAB) and locate a missing CMW
- notification of next of kin and interaction with social/mainstream media.

The exercise is the focal point for emergency preparedness in the state.

Scenario

The scenario commenced at 01:00hrs on Tuesday 26 October 2021 and was based on a Loader carrying a diesel fuel pod, traveling inbye, East Mains B heading, colliding with another Loader traveling outbye at 11-12ct. Both operators were injured. One had a fractured arm the other had a leg injury and burns from a fire on the loaders. Figure 2 shows the location of the incident and the inbye working panels. All the intakes and return roadways adjacent to the incident site became polluted with an irrespirable atmosphere meaning any CMWs that wanted to evacuate outbye of the fire would have to travel through an irrespirable atmosphere wearing compressed breathing apparatus (CABA).

The injured CMWs were both outbye of the incident scene and were discovered by the first responders to the fire.

The two CMWs had simulated wounds to provide a realistic effect for responders.

The fire took hold of the diesel pod and vehicles within 15mins of the accident. Thick black smoke and very high contaminates travel inbye. From East Mains 14ct underpass thick toxic smoke fills all intake roadways of East Mains to 33ct.

Smoke and contaminates migrate throughout the mine to varying degrees as per the Ventsim™ and Safesim™ models. For details of the vehicle and the mine plan showing other relevant location refer to Figure 3.

Other factors for the scenario included:

- Contaminates reporting to production panels are above legislated limits.
- The overcast East Mains 14ct C heading was compromised providing for contaminates to travel inbye C heading
- Downcast shafts provided fresh air at locations inbye East Mains 33ct, diluting smoke and contaminates into production panels.
    - These shafts also provided fresh uncontaminated air where CMWs could wait for rescue or until the fire had been extinguished.
- Inbye personnel had to escape in an irrespirable, smoke-contaminated atmosphere.
- The personnel outbye of the incident could respond to injured CMW and the fire, as could evacuating CMWs.
- At 33ct East Mains, egress via all intakes was not possible by vehicle or on foot. Options for CMWs included self-escape via an alternate egress in East Main A heading return 33ct - 3ct where exit was outbye the fire or refuge in fresh air at downcast shafts.
- Two CMWs from separate development crews were incapacitated (1 symptoms of heart attack, 2nd had a sprained ankle) and were not able to walk. When the crews arrived at East Mains 33ct and vehicles could no longer be used due to zero visibility, decisions were required by CMWs how to deal with the incapacitated CMWs
- Firefighting activities required escalation and use of the Turbex™ foam generator.

- Aided escape for CMWs would be required inbye the fire location by QMRS.
- When fire was brought under control contaminate levels inbye were still greater than legislated limits.
- Technical data via SIMTARS Safesim™ software including gas and ventilation data was provided for analysis of the IMT to undertake risk-based decision and processes to assess risk for responders and QMRS activities.
- The efficiency and accuracy of information management from escapees, responders and including collation/reporting of technical data relevant to the emergency evet.

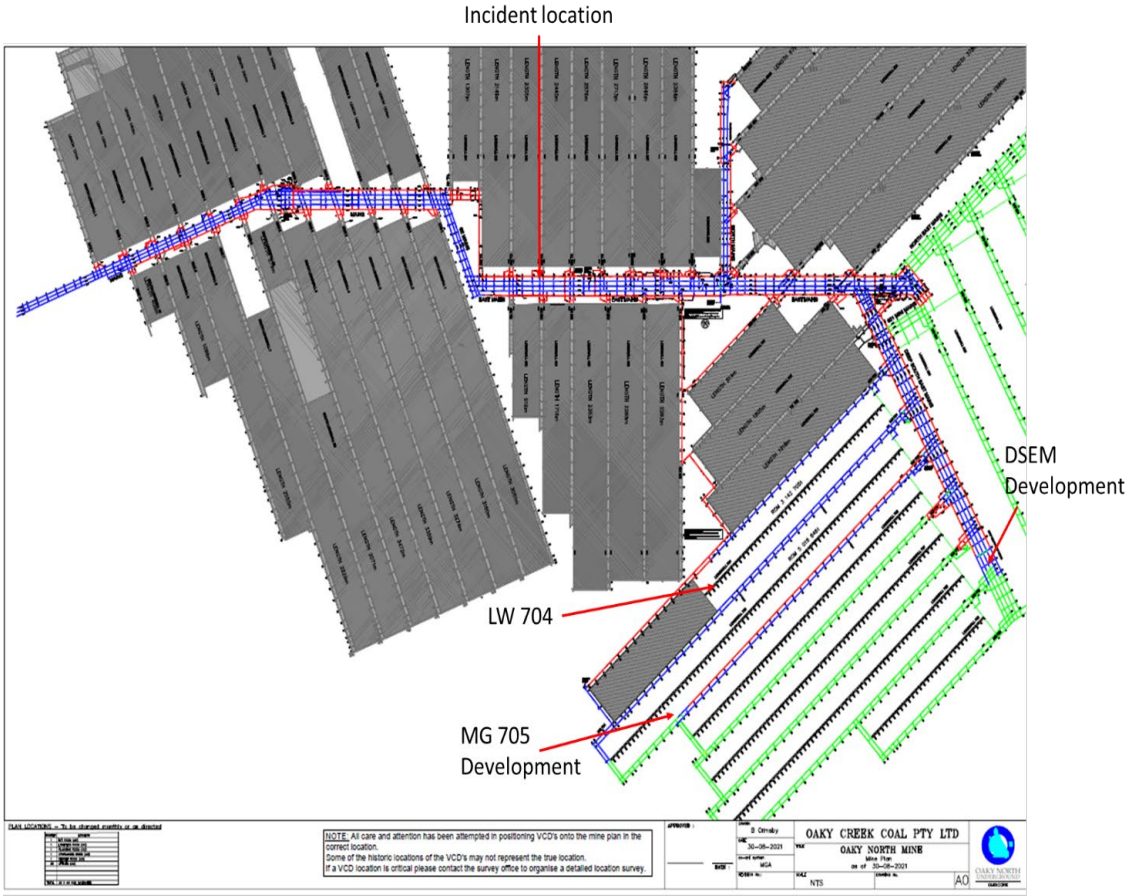

Figure 2 Oaky North Mine Plan Incident site and working sections

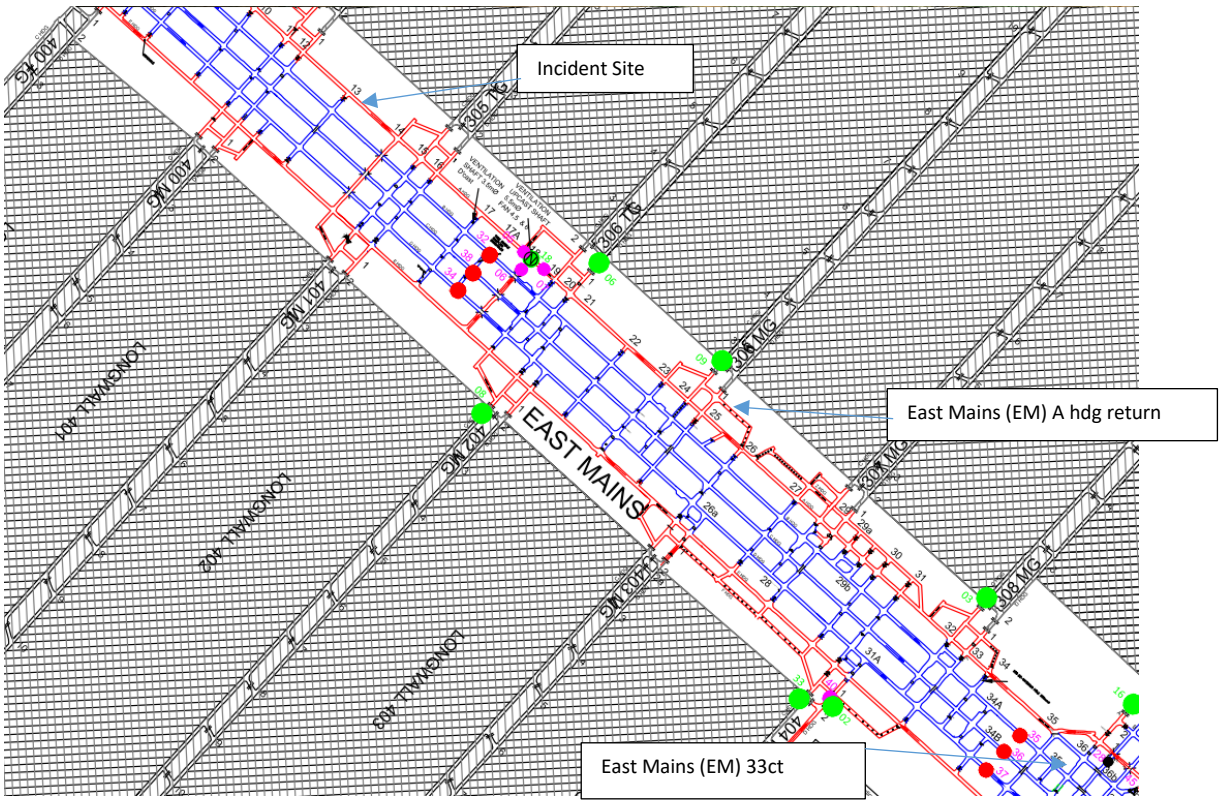

Figure 3 Mine Plan East Mains 10ct – 35ct

Assessment of the scenario

Like the 2020 level 1 exercise at Moranbah North mine, the format for the 2021 level 1 exercise was organised to run over two shifts. The underground evacuation was planned to be complete by 06:30hrs, enabling the night shift CMWs to remain within the mines fatigue management plan.

The practical response to the fire and the CMWs requiring aided escape continued into dayshift along with the surface Incident Management Team (IMT). Surface IMT activities were continued until the protocols for deployment of QMRS were applied and deployed to provide aided escape to the CMW.

The assessor's arrival was staggered with the underground assessors (including Control Room) arriving prior to midnight 25 October 2022 to travel underground and take up positions in panels and at the incident site.

Original to this exercise two assessors commenced at the start of nightshift to shadow the Shift Undermanager and the shift 2IC to observe actions and decisions as the exercise commenced.

Surface assessors arrived on site after the underground assessors deployed underground at approximately 2330hrs 25 October.

In total 35 assessors, including technical support personal from SIMTARS, participated in the exercise.

Underground Assessors		
Name	Location	Organisation
Mark Freeman	Incident Scene	QMRS
Richard Firth	Incident Scene	QMRS
Shane Feeney	Incident Scene	BMA Broadmeadow Mine
Adrian Murphy	Incident Scene	BMA Broadmeadow Mine
Curtis Barton	Undermanager/2IC	Fitzroy Carborough Downs Coal Mine
Darren Place	Undermanager/2IC	Fitzroy Carborough Downs Coal Mine
Tim Lawrence	Longwall	Anglo Grosvenor Mine
Andrew Collins	Longwall	Carborough Downs Coal Mine
Samantha Black	Development MG705	Kestral Coal Mine
Aaron Firth	Development MG705	Kestral Coal Mine
Mark Klienhaus	Camera and video	SIMTARS
Joel Treasure	Development Deep SE Mains	Kestral Coal Mine
Carl Skinner	Development Deep SE Mains	Fitzroy Carborough Downs Coal Mine
Brett Murphy	Outbye SE Mains	Grosvenor
Mannie Coates	Underground coordinator	Glencore Oaky North Mine
Tony Armstrong	Underground coordinator	Glencore Oaky North Mine
Shaun Dando	QMRS/ERT response	Anglo Grosvenor Mine
Jason O'Connor	QMRS/ERT response	Anglo Moranbah North Mine
Dan Livingstone	QMRS/ERT response	Anglo Aquila
Surface Assessors and Technical Support		
Name	Location	Organisation
Ernest Gosk	IMT	Fitzroy Carborough Downs Coal Mine
Cheyanne Stevens	IMT	Fitzroy Carborough Downs Coal Mine
Les Marlborough	IMT Planning	Anglo Grosvenor Mine
Nicki LaBranche	IMT Planning	UQ MISHC
Stephen Smith	IMT Operations	RSHQ
Peter Stigwood	IMT Operations	Fitzroy Carborough Downs Coal Mine
Jason Hill	IMT Logistics	ISHR CFMEU
Gareth Kennedy	IMT Logistics	SIMTARS
Theodore George	Media and Family Liaisons	DNRME
Chris Gatley	Control Room	Anglo Head Office

Michelle Brunker	Control Room/Tag Board	Anglo Grosvenor Mine
Martin Tsai	Safesim™ Tech support	SIMTARS
Linda Kelson	Safesim™ Tech support	SIMTARS
Sharon Jones	Administration Support	SIMTARS
Martin Watkinson	Exercise Coordinator	SIMTARS
Geoff Nugent	Exercise Coordinator	RSHQ

Table 1 List of assessors

Underground assessments

Assessors were placed in four locations underground:

1. East Mains Incident site – this scenario tested the fire fighting and first aid capability of the incident response.
2. DSEM Development panel and outbye – the scenario tested the incident response in relation to underground self and aided escape by vehicle and on foot. The escaping crew were encumbered by a CMW requiring aided evacuation.
3. Maingate 705 Development – the scenario tested the incident response in relation to underground self and/or aided escape by vehicle and on foot. The escaping crew were also encumbered by a CMW requiring aided evacuation.
4. Longwall 704 – this scenario tested the Longwalls crew's response to self-escape by vehicle and on foot.

East Mains Incident Site – B heading 11 – 12ct

Assessors: Shane Feeney, Adrian Murphy, Richard Firth, Mark Freeman

The scenario involves a loader traveling outbye damaging a door of the conveyor belt overcast East Mains 14c/t C HDG. The operator calls control from the 13c/t CABA refill station and reports damage then as the Loader is travelling out it collides with a Loader carrying a loaded fuel pod the collision results in a fractured leg and chest injuries to one operator and the ensuing fire causes burns to the second operator. The operator with burns assists the first operator to safety at 11c/t and raises the alarm via the DAC at 11-10c/t B HDG.

Prior to the loader collision a loader operator informs the CRO of damage to a VCD at 13ct (damage actual 14ct C heading causing ventilation short circuit into the belt road).

The initial notification of the vehicle collision resulting in injuries to two CMWs and an ensuing fire at the incident scene, 12ct B heading, was communicated to the CRO at 0110hrs by one of the injured operators at East Mains C hdg 11-10ct outbye the incident.

The response from CMWs outbye the incident scene was efficient. First response activities were conducted earnestly and realistically by responders who genuinely engaged in the incident

scenario resulting in an effective response.

Observations made by Level 1 assessors are outlined below.

0131hrs Outbye ERZC Andy Morris arrives from outbye and is shown a picture of the scene and told that the radiant heat from the fire is too great to enter 12c/t. Andy and CMWs retreat to a safe location.

0135hrs A loader arrives with a fire substation from the surface

0137hrs Fire line being run from the hydrant at 10c/t to a dividing breaching piece then 1 fog and 1 jet Andy Morris arrives at casualty site and assesses casualty.

> *Assessor Note: Hoses were walked out instead of bowling, there is nothing in the roadway to stop bowling. When water was turned on there was many knots in the hose that caught people's hands from the water pressure when they tried to untangle them. Responders Did not flush the hydrants Use care when running out hoses as there was a number of damaged female BIC fittings that caused issues later in the firefighting activities*
>
> *Mr Morris assessed injured CMW in Belt road. Mr Morris also asked the injured CMW about injuries and also asked for information about the nature incident, location of incident and nature of injuries to the other CMW. Good reassurance made to Injured CMW when Mr Morris went forward to investigate the fire and incident scene*

0140hrs CMWs commenced running out hoses to advance the end of the hose to the 11c/t hydrant

> *Assessor Note: This hydrant was tagged out of service and the responder did not check for water pressure by flushing before running our all the hoses, cost time in initial response.*

0142hrs CMW arrives with First Aid Kit to assist injured CMW with burns. ERZ Controller directs CMW to assist Injured CMW with first aid.

> *Assessor Note: CMW was not first aid trained and was unsure of what to do and what was in the First Aid Kit. No secondary surveys done of CMW with burns. Assessor gave coaching to First Aider of what to do and started to irrigate the burns with Saline Solution. CMW providing First Aid did reassure the injured CMW very well.*

0147hrs Operators apply water curtain with fog nozzle to give access into the injured at 11c/t. ambulance reverses down the road and backs into 11c/t. Casualty with broken leg located and treatment started First Aider CMW from Workshop.

> *Assessor Note: This process was managed quite well, access to patient and treatment was off a good standard.*

0150hrs Fire fighting continues Operators trying to change over branches, but hoses damaged,

and proves difficult

> *Assessor Note: Fire hose fittings should not be dragged on ground or run over by vehicles, this will cause damage and make inoperable.*

First Aider removes casualty's shirt with medical shears 1st set of observations taken on ROB using blood pressure cuff and fracture being treated. Secondary survey done but missed abdomen and chest.

> *Assessor Note: Continuation of Irrigation of Burns. Still no Secondary Survey performed on one casualty. Good consecutive work being done and not relying on one person to do everything using resources efficiently.*

0155hrs Experienced people being swapped out from firefighting to bring up the foam generator to the fire scene

> *Assessor Note: No rescue personnel at scene at this point There seemed to be prior knowledge that low expansion foam would not be effective experienced CMWs being swapped out from firefighting to bring up the foam generator*

0204hrs the order was given to install the high expansion foam generator

> *Assessor Note: Assessor asked if permission had been received from Ventilation Officer/IMT to use the generator. The low expansion branch was available but not used*

0204hrs Burns Casualty packaged in the basket stretcher, into ambulance and transported to the surface

> *Assessor Note: Good communications and clarification of what was happening and what each person was doing good control. First aide responders realised that Entonox couldn't be used as he was unconscious oxygen given using therapy mask and 8lpm*

0228hrs Low expansion foam is being set up to apply to the fire using an extra fire line Water is applied to the low expansion branch

> *Assessor Note: There are 3 hoses now applying water to the fire from one 38mm feed hose, this pressure drop does not allow for foam to reach the loaders Jet nozzle was washing the foam that had need applied away*

0238hrs Permission from IMT is given to use the high expansion foam generator

0240hrs High expansion foam generator is started. Assessor turns off water and tells the operator that you can hear water running down the pipe range, but pressure can't be built up

> *Assessor Note: Fire fighters are using blue hi ex drums of foam which do not seem to be very effective. The fire had burnt through the pipe work inbye but this was not identified for some time*

0255hrs - 0307hrs Water hoses are run to 8c/t but they are told that there is no pressure. Water

on but minimal water pressure the water pipe inbye is isolated at 11c/t and pressure is returned to the pipe range outbye.

0310hrs Water is turned on from 10c/t but hi ex generator is not operating

> *Assessor Note: Fines from the belt road hydrant that was not flushed have blocked the inlet to the generator*

0321hrs Inlet is unblocked and foam is being produced again Assessor informed the ERZ that the hi ex generator has stopped working and the roof is bagging inbye of 11c/t Jet is used again when the hi ex is turned off

> *Assessor Note: ERZC pulls operators back outby of 11c/t lip. The use of a jet nozzle displaces the hi ex foam fire fighters rotate with the outby crew that are told to take a rest*

0355hrs New fire substation arrives with hi ex generator and foam Hi ex generator is running again

0418hrs Due to Hi Ex foam recirculation firefighting team build wall of drums adjacent to generator. Hi ex foam supply is depleted soon after.

> *Assessor Note: Assessors ask them to use white 1% low expansion drum for trial and it makes better foam*

0450hrs – 0505hrs Assessor informs ERZC that the roof is poor all the way to the intersection Timbering equipment arrives 3 prop setters are installed at the lip of in HDG inbye 11c/t

0506 -0536hrs Assessors instructed responders to cease Turbex™ foam operations, with fire coming under control. Fire watch was sustained.

Note – The remnant fire site continued to produce products of combustion which maintained unacceptable levels of contaminates inbye the incident site to East Mains 33ct providing for the necessity to deploy QMRS for aided escape of CMW positioned at East Mains 33ct B-C.

What worked well

- Good control from the ERZ managed scene throughout
- Use of the firefighting fog to protect the crew from the radiant heat for entire exercise
- Good initial information gathering
- On the patient with the fracture there was a good level of knowledge of first aid
- Fairly good understanding of location for equipment in the ambulance
- Calm approach when confronted with injuries and screaming
- Used systematic approach
- Communications from responding CMW to people assisting around him and taking charge

- Hazard identification and preparing areas for intended action.

Recommendations

Fire fighting

- Ensure basic firefighting training includes the use of firefighting equipment for all classes of fire and the best medium to fight them
- Ensure the potential ramifications of using high expansion foam without modelling the outcome is understood
- Ensure limitations of firefighting equipment is understood e.g. Running 350m of hose lines can cause excessive pressure drop and consider using 64mm hoses to allow for maximum flow of water over a longer distance
- Conduct basic fire training as part of ongoing skills maintenance
- Conduct smaller scenarios on regular basis on each crew.

First aid

The mine and industry should review first aid training scheme so it includes:

- Basic First Aid training for all CMWs
- Effective secondary surveys of patients to identify nonobvious injuries
- Maintenance of knowledge for contents of first aid/trauma kits and first aid room
- Practice in the use of some less common equipment such as vac splints and blood pressure cuffs
- Conducting simple first aid scenarios regularly within groups to help people deal with incidents including more regular familiarisation with provided equipment.

The complete timeline is available in appendix 1.

Figure 5 Photo shown to firefighting responders at incident site using Turbex foam generator

Figure 4 The photo of the fire shown to responders

Deep South East Mines Development (DSEM)

Assessors: Joel Treasure and Carl Skinner

The DSEM crew consisted of 7x CMWs and 1x ERZC.

The scenario for the DSEM crew included a crew member becoming incapacitated due to an ankle injury leaving them unable to walk to self-escape.

When assessors arrived at the DSEM crib room all CMWs and the ERZC were present noting the continuous miner was stood and face secured.

At approximately 0133hrs the ERZC received a phone call from the CRO notifying him of a fire outbye in the East Mains and commence self-escape with his crew.

Prior to boarding the drift runners to commence self-escape the crew members donned CABA and were checked by the ERZC and Mines Recue trained crew member.

Additionally, while boarding the drift runner the ERZC was informed a crew member had seriously strained their ankle and was unable walk.

At **0145hrs** the crew departed the crib room in the drift runner.

At **0150hrs** the crew arrived at 52ct East Mains (EM) D heading intersection being the location of an air split and a key decision point - fresh air travelling inbye D heading from a downcast shaft located at EM D heading 36ct, and smoke/contaminated air reporting from B heading and through an underpass.

After contacting the CRO the ERZC decided to travel outbye via D heading in fresh air. The ERZC instructed the crews members to remove CABA face masks and turn off CABA while travelling in D heading.

Arriving at EM 33ct D heading (approx. **0021hrs**) the ERZC was provided information that the smoke was too thick and unsafe to continue travelling out any intake D, C and B headings.

After much consideration, the ERZC determined to continue self-escape via A heading return on foot. A heading was contaminated with smoke but to a much lesser degree compared to the intakes with visibility at least 20 meters.

The ERZC and crew refilled their CABA (including the patients) at the CABA refill station positioned in 33ct.

Additionally, the decision was made to place the incapacitated patient into a stretcher and carry him in A heading return (entering at 33CT) to fresh air, which was outbye 11ct. Furthermore, unknown to the ERZC and crew entry to B heading intake was not possible until 3ct due to inbye mandoors being inoperable.

At 27ct A heading it was apparent to the assessors that the physical condition of the crew members carrying the patient was deteriorating considerably and CABA air consumption rates were high. The assessors ceased the patient carrying activity to ensure an unacceptable level of

risk to CMWs did not emerge.

To provide an immediate learning opportunity the assessors engaged with the ERZC and crew to discuss the circumstances they were in and consider what other decisions and actions may have been appropriate for a more effective self and aided escape. The assessors then allowed the ERZC, crew and patient to continue to egress A heading and participate in the exercise.

A learning for the exercise organisers is to provide scope for assessors to adapt their area of the exercise so that when certain actions are taken by CMWs the potential outcomes are realised e.g., unable to continue self-escape.

What worked well

- All CMW's donned SCSR in a controlled manner
- The ERZC instructed the crew to take the stretcher from the emergency pod and strap it onto the side of the drifty as a contingency to assist the injured CMW.
- Prompt and efficient process accounting for CMWs and self-escape from the panel.

Recommendations

- Self-escape training should provide varied physical activities when wearing breathing apparatus to provide experience and knowledge for CMWs to understand their physical and equipment limitations.
- Self-escape training should include more regular desktop exercise analysis with diverse scenarios including potential aided escape situations for incapacitated crew members.

The complete timeline is available in appendices 2 and 3.

Figure 6 MG 705 crew connecting incapacitated CMW to CABA refill station

Maingate 705 Super Panel

Assessors: Samantha Black and Aaron Firth

The MG 705 crew consisted of 1x ERZC and 18x CMWs.

Assessors arrived at the MG705 crib room at midnight, there was one CMW in the vicinity at the time who informed assessors that one of the face crews was about to come for crib, the other was to continue producing.

The first crew arrived for crib shortly after.

The second crew experienced a breakdown and arrived for crib (they don't usually all break at the same time).

For the next hour the crews had crib as assessors awaited notification of an incident.

When this had not come by 0100, the ERZC made the decision to send his crews back to the face. This was with intent as he was expecting an exercise to commence and wanted to ensure it was realistic.

At **0128hrs** the ERZC received a phone call from the CRO in the crib room notifying him of the incident and fire in the East Mains. The face crews were alerted and retreated to the crib room to commence donning CABA.

The following environmental readings were provided to the ERZC and stated that there was now smoke entering his panel: CO – 290ppm, CO2 - 0.21%, O2 -20.7%, CH4 - 0.02%. The ERZC ensured the two mines rescue trained crew members were specifically in the provided training CABA.

At **0142hrs** all CMWs departed the crib room in two drift runners.

When the crew arrived at East Mains 52ct the ERZC directed the CMWs to travel via D heading in fresh air.

At **024hrs** both drift runners had arrived at EM 33ct and commenced the CABA refill process at the refill station.

What worked well

The assessors noted that along with the ERZC the rescue team members demonstrated excellent leadership assisting crew members refill CABA, providing good communication and maintain a calm and controlled process during the entire self-escape.

As part of the exercise, during the self-escape a CMW became ill, and condition deteriorated to such a point the CMW could not continue self-escape on foot.

The crew assisted the incapacitated CMW to refill his CABA at EM 33ct then kept him hooked up to CABA refill station. A discussion between the ERZC and two rescue team members ensued to determine the course of action for the continued self-escape of the crew and aided escape of the incapacitated CMW.

At the insistence of the rescue team members, it was determined to leave the incapacitated CMW worker hooked up to the refill station in order not to place the self-escaping CMWs at an unacceptable level of risk carrying the CMW.

The rescue team members understood the limitations of people and CABA when carrying a person in a stretcher. Additionally, with the incapacitated CMW having access to potentially days of air supply and a response underway to eliminate the fire hazard, the ERZC and rescue team members determined that a safer and more effective aided escape could be provided to the CMW via an inseam or rescue team response.

The ERZC sat down to discuss this with the ill CMW to explain what was happening and that while he didn't want to leave him it was in everyone's best interest and that someone would be back to get him.

The crew then continued self-escape on foot via A heading and entered fresh air at 3ct B heading.

Recommendations

Increased training if SCSR/CABA/Fire and first response – the donning of equipment was good in this group however willingness to assist in rescue/ firefighting was minimal (which is assumed due to lack of confidence/competence)

The complete timeline is available in appendix 4

Figure 7 LW705 crew donning CABA and SCRSs at crib room

Longwall 704

Assessors: Andrew Collins and Tim Lawrence

The Longwall consisted of 1x ERZC and 9x CMWs, there was an additional CMW outbye at 13ct monitoring a pump.

Longwall production was occurring prior to the initiation of the incident and subsequent emergency withdrawal.

At **0116hrs** the ERZ Controller contacted the CRO to provide his normal update when he was informed of smoke progressing down B heading in the East mains.

The ERZC, once off the phone, attempted to call the MG which was unsuccessful. He then assembled all persons that were in the crib room and informed them of the situation, instructing them to get the drift runners ready for escape

The ERZC then went to the BSL area and stopped the AFC chain, contacting face personnel of the situation via DAC instructing coal mine workers to report to the crib room immediately.

Note: In the crib room equipment for use in the exercise were 5 x CABA and 7 x SCSRs

By **0125hrs** all CMWs had reported to the crib room. The ERZC removed the escapeway plan from the rib and laid out on the crib room table for all CMWs to see.

The ERZC explained to the crew of the intention to travel inbye the LW face as there is a downcast shaft that would provide fresh air, the ERZC also stated to the crew that there was a CABA refill station at 31ct MG704, and the crew would drive there and call control.

Additionally, prior to travelling inbye the LW the ERZC discussed a plan of driving around the back of LW blocks via bleeder roads as they believed the environment would not be contaminated by the smoke outbye. This route was not the designated primary escapeway.

The crew arrived at 31ct LW704 at **0144hrs**. On arrival the ERZC contacted the CRO and informed of his intent to continue travelling inbye via the bleeder road in fresh air and exit into the East Mains.

What worked well

During the communication with the CRO the shift Undermanager also spoke with the ERZC regarding the intention to travel inbye. The Undermanager advised the ERZC to egress via the primary escapeway due to the risk of potentially getting bogged egressing via the bleeder road. The ERZC accepted the advice and commenced self-escape with the crew via the primary escapeway DSEM and East Mains.

While egressing via the primary escape way the ERZC and crew accessed each CABA refill station, checking CABA pressures and maintain communication with the CRO. The self -escape process was conducted to a high standard.

The crew arrived at EM 33ct at **0304hrs**. Based on the information that all intake roadways were

impassable due to smoke, The ERZC decided to egress via A heading on foot.

While at EM 33ct refill station the ERZC and crew encountered the incapacitated CMW secured to the refill station by MG705 crew. The ERZC decided that carrying the CMW in a contaminated atmosphere would present an unacceptable level of risk to his crew during self-escape on foot. The incapacitated CMW was assessed prior to the crew departing via A heading.

The ERZC and crew continued outbye simulating CABA refill at 22ct refill station. The ERZC also contacted the CRO to provide crew condition update, then continued outbye until able to exit into B heading fresh air via 3ct at **0405hrs**.

The complete timeline is available in Appendix 5.

Recommendations

- All underground coal mines should ensure the following elements are integrated into self-escape training for CMWs. Training should include:
    - training in the underground environment in simulated restricted visibility, including donning and changeover of breathing apparatus.
    - varied practical self-escape scenarios underground in self-escape training, including walking via alternate escape routes.
    - varied physical activities when wearing breathing apparatus during self-escape training to provide experience and knowledge for CMWs to understand their physical and equipment limitations.
    - more regular desktop exercise analysis with diverse scenarios during self-escape training, including potential aided escape situations for incapacitated crew members.
    - testing CMWs ability to self -escape without the assistance of the ERZC in self-escaping training.
- All underground coal mines should review the strategy of refuge for CMWs where self-escape or assisted escape from a mine is unachievable during an emergency.

Queensland Mines Rescue Service team deployment underground

After the Incident Controller initiated a QMRS rescue team member response at 0355hrs the following actions took place.

- **0413hrs** – QMRS ALERTS call to personal mobile phones received by designated QMRS team members advising of emergency exercise activation to Oaky North Mine
- **0426hrs** - OCN Staging area coordinator arrived at site rescue substation to check building was open and ready to receive team members.
- **0429hrs** - Mines Rescue Coordinator task card holder arrived at the site rescue substation

to activate resource management board and T card system

- Over the next 2 hours rescue team members from OCN and other mutual assistant mines arrived at site and reported to the Mines Rescue Room.
- **0515hrs** via the ALERTS communication system it was noted that 34 rescue team members were available to respond.
- **0710hrs** two rescue teams were formed that collected minimum equipment and BG4 breathing apparatus.
- **0810hrs** pre-operational check on rescue team equipment completed and are then transported to the muster area to collect cap lamps and SCSRS
- **0910hrs** Rescue team captains and team members were presented with the Captains Task Sheets and Authority to Enter by the Incident Controller and QMRS Operations Manager
- **0926hrs** Rescue Teams deploy underground.

Once deployed, underground rescue teams established FAB and applied mines rescue protocols to a good standard.

The CMW at 33ct East Mains requiring aided escape was extracted to FAB by **1055hrs**.

A full timeline of QMRS rescue team activities is outlined in appendix 14.

What worked well

- OCN had designated task cards and personnel for the Staging Area Coordinator and Mines Rescue Coordinator.
- Handover between nightshift and dayshift Mines Rescue Coordinator task card holders (Substation Coordinator roles) was done efficiently.
- OCN Rescue Team members managed Substation, with QMRS Acting Operations Manager, Trainer, and Technicians providing additional assistance and guidance once onsite.
- Within two hours of activation of QMRS there were 1 x QMRS Acting Operations Manager, 1 x QMRS trainer, 1 x QMRS Technician, 14 x Team members, 1 x QMRS Equipment trailer on site
- Within 3 hours an additional QMRS Technician, Equipment trailer and 4 additional team members
- Rescue team members from different sites worked well together. Good prompts, questions, clarification and cross checking of information being provided.
- OCN Mines Rescue Substation was of sufficient size to accommodate the rescue team members and equipment in this exercise.
- FAB Controller and assistant identified all equipment required and managed FAB well

- Good communications and care of Injured CMW when located

Recommendations

- QMRS to review Level 1 exercise involvement including ALERTS communication system, to identify improvement opportunities. Feedback from several rescue team members indicated some had difficulty with responding to the ALERTS callout, including contacting personnel on the designated contact number.
- QMRS and Mines Rescue Coordinators to identify, and regularly communicate to all rescue team members the requirements and expectations of where and how to access each mine site when responding to an emergency or planned exercise. Some delays were experienced by rescue team members accessing the mine site.
- All Mines Rescue Coordinators to consider a site-specific task card or checklist that details the process of preparing and setting the Mines rescue substation up to receive multiple team members and equipment in the case of an emergency response requiring Mines Rescue. Consider how the Substation will flow and:
    - clearing of excess equipment
    - where equipment will be tested and prepared
    - process to provide accurate and up to date incident information (e.g. whiteboard or screen) to Substation Coordinator and team members
    - location for arrival of team members and kit bags
    - location for arriving equipment
    - briefing rooms
    - designated staging area prior to deploying.
- All Mines Rescue Coordinators to familiarise Mines Rescue trainees on their individual sites with locations of QMRS Duty Card 5 Substation Coordinator, the allocated vest, and any site-specific requirements to manage a mines rescue activation to site.
- QMRS to review frequency and content of training on the use of QMRS Duty Card 5 and Resource Management Board system. Include improvement opportunities identified in emergency exercise such as any information that is required to be updated after the initial filling out of T Card's.
- QMRS to review and identify if there are any alternative more efficient options when managing team member and resource movements. This may include arrival to substation, confirming team member status (current medical and training records, technical support etc). Consider any technology that may assist such as electronic swipe ins, alternative T Card systems, tablets or similar.
- All Mines Rescue Coordinators to consider sites Mines Rescue Substations to have pre-

prepared rescue team visitors personal tags that can be allocated and used in a deployment or in training, and only require updating of name, lamp and SCSR number.

- Sites to include actions or prompts in emergency duty or task card system to ensure sufficient personnel are allocated to pre-prepare and allocate cap lamps, SCSR, (and potentially wi-fi phones, additional gas detectors) for rescue teams to improve efficiency and timeliness of deployment.
- QMRS to identify, communicate and reinforce areas for improvement identified in emergency exercises and active deployments during scheduled training rounds.

Not all rescue team members were fully proficient and confident with some areas such as pre-operational checks, newer style BG4 masks, Captains checks, two-minute stop, communication (process and expectations if off radio, travelling in a vehicle etc), application of guidelines, connection of Carevent to mask.

- QMRS to consider further training to specifically highlight when teams are travelling in a vehicle inbye of FAB, including distances that can be travelled, designated return triggers, process for two-minute stop, communication challenges, etc
- All rescue team members to confirm they have adequate personal equipment such as helmets, cap lamp belts etc available to respond to an emergency either from home, camp, or site. Ensure QMRS rescue team member identification is also available.
- QMRS to review and communicate process when a fixed communication device is not operational or found to be in place at the designated FAB. Include alternatives that can be used if available. If deciding to utilise any site-specific mobile communications determine how this can be communicated so that it is prepared and ready to go with teams on deployment without causing unnecessary delays. Consider the reliability of Wi-Fi coverage.

Figure 8 QMRS Surface Captain Checks of Team Member

Surface assessments

Oaky North Coal Mine emergency response framework

Oaky North Mines incident control framework '*PHMP0003 Emergency Response*' states:

> *Incidents will be controlled in accordance with the GCAA Incident Management system baseline structure. During the first response to an incident, a Scene Controller will perform the basic function of control. If the incident intensifies and incident management becomes more demanding, an Incident Controller will take control.*

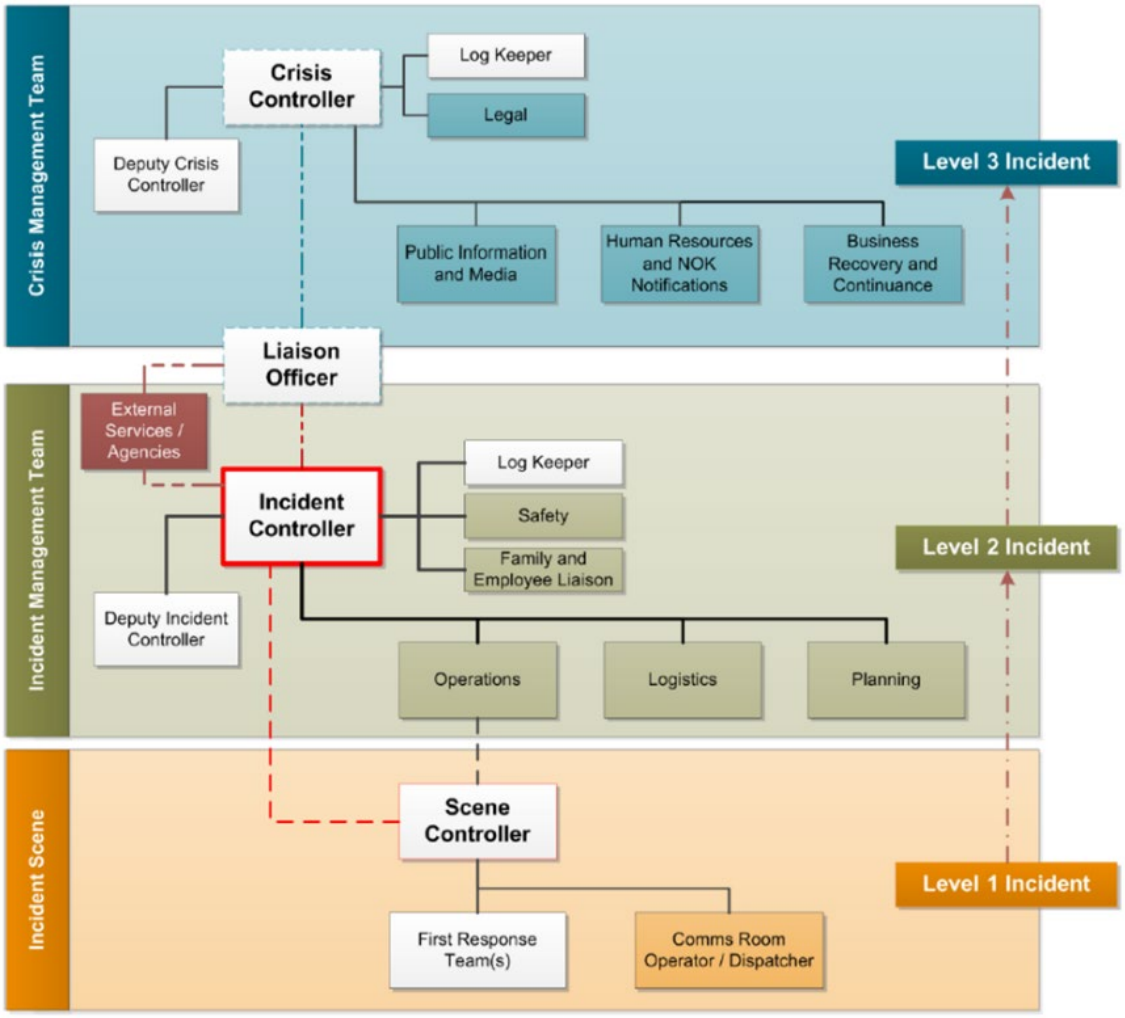

Figure 9 Incident Management Team baseline structure

Surface assessment locations

Assessors were placed in various locations on the surface to monitor the response to the incident. These locations varied as the response to the incident developed. Assessors observed the response from the following locations/functions:

- Control room
- Undermanager

- Incident Management Team (IMT)
- Operations team
- Planning team
- Logistics team
- Queensland Mines Rescue Service (QMRS)
- Social and mainstream media.

The following outlines the surface response during the exercise.

Control room and tag board

Assessor: Chris Gately and Michelle Brunker

Prior to the incident commencing two CROs were conducting control room activities including receiving production panel updates, systems monitoring, and responding to alarms.

The notification of the emergency was received by a CRO at 0109hrs which triggered the CRO to initiate an emergency via activation of the surface siren.

Throughout the incident CROs facilitated continued communication between the incident scene and escaping CMWs, a timeline of CRO activities and actions are outlined in appendix 6.

What worked well

- CROs, Undermanager's and surface CMWs supporting the control room worked collaboratively throughout the exercise and demonstrated a sense of urgency and care for CMWs underground.
- Undermanager took charge as Initial Incident Controller and demonstrated leadership and provided clear direction of what actions he wanted taken.
- Underground crews' response to initiated self-escape/withdrawal strategy and provide local response to fighting the fire.
- Surface CMWs responded to surface siren and provided support to implement Undermanager's and CRO requests for sentries, supplies, transport and mobile equipment readiness and deployment.
- The tag board sentry had good control of who was underground and their original locations. When CMWs arrived on the surface they were efficiently processed at the tag board and directed to debrief. Injured CMWs were also effectively accounted for by the tag board sentry.

Areas for improvement

- Capability to identify and track location of both underground and surface CMWs
- Setting clear objectives and scheduled routine (example 1 hourly) for Emergency Status Update Meetings that include key stakeholders (IMT, CRO and arrange update to Duty Card Holders)

- Use of technology to link IMT teams and Control Room to capture a master version of event status, objectives, and actions – to limit loss or misinterpretation information through use of multiple runners, note taking and verbal communications (MEMS/EMQnet/Microsoft Teams, etc)
- Validation of data – validated intelligence is vital to ensuring facts are established to apply risk based and informed decision making. (Example when gas sensors have reached capacity and flat lined due to a large fire underground that resulted in localised strata failure – how do you have credible information to ensure atmosphere is safe for CMWs to remain underground and fighting a fire?)
- Mine communication systems - reported that the mine had limited cap lamps capable of communication and nodes underground. Mobile Phones were relied on, which on numerous occasions failed part way through communications between CRO, underground CMWs and Deputies leading to frustrations and delays in information transfer. Assessor was informed that the PED system doesn't work, and multiple Delay messages observed prior to exercise activation and not used as no confidence in the system. Did not witness DAC system being used to communicate emergency to outbye workers and Drillers and an Outbye Electrician were not identified as missing – DAC may have assisted.

Recommendations

Mine

- Consider implement real time technology solution that provides effective capability to identify the location of CMWS both underground and on the surface.
- Review and implement technology solution for capture and communication of emergency event management including objectives, status updates and action tracking
- Review Environmental Gas monitoring requirements and TARP actions CROs and those responsible for managing an emergency must take to validate environment conditions when sensors have reached limits and flat lined to ensure true environmental conditions are established and validated to ensure risk based informed decision making can be made before continuing to allow CMWs to remain underground or conducted in seam firefighting by crews.
- Use of electronic gas reporting that captures real-time acknowledgement and by whom, actions taken and generates active alarms at start of each shift. Remove paper based manual transfer of data to limit human error.
- Briefing and Handover of emergency to oncoming CROs needs to be documented and approved to ensure accuracy of data and current objectives and actions are communicated. (It is noted however it was done verbally between CROs).

Industry

- Utilise emergency management technology solutions that provide capable of maintaining status of the emergency, objectives, and action tracking in real time between all Duty Card

Holders, key stakeholders, and those off site to facilitate active and informed emergency management.

- Need to utilise real time coal mine worker tracking solution that provides capability to identify location of people underground and on surface.
- Consider risk and the erosion factors to environmental monitoring system and does the mine capture TARP actions to be implemented if gas sensors have reached maximum capacity (as in this exercise all flat lined) to ensure accurate data is gathered to inform decision making and assurance it is safe for CMWs to remain underground or fighting a fire underground.
- What are the limitations or erosion factors of your mines communication system, can you communicate an emergency event to all CMWs in all areas of work on your mine site?

Figure 10 Surface Tag Board control

Undermanager

Assessor: Curtis Barton

The IMT process commenced soon after the initial notification of the incident at **0109hrs** by way of the Shift Undermanager (UM) who was conducting tasks in and around the statutory officials' offices on the surface of the mine.

When the emergency alarm sounded (**0110hrs**) The UM, along with the shift mechanical and electrical supervisors, reported to the Control Room where the CRO was communicating with a CMW underground providing information regarding the emergency underground involving the vehicle fire and injured CMWs.

Positioned in the Control Room, The UM assumed control of the developing emergency initiating the following actions

- Requested CRO notify production crews and outbye personnel to egress to outbye side of incident site.
- Requested that CRO's ensure they have relevant support or scribes to assist in documenting incident and recovery.
- Initiated first response teams on the surface using shift supervisors to gather personnel.
- Briefed CMWs responding to the incident

Subsequently the Undermanager reviewed real time gas monitoring data throughout the mine and considered possible ventilation change tactics to support the firefighting response in the East Mains.

At **0138hrs** The UM requested the mechanical shift supervisor initiate senior management to form a formal IMT. SSE/UMM David Stone, the ventilation officer (VO) and other senior managers were notified to immediately respond.

Prior to formation of the formal IMT The UM and the on-scene incident controller (ERZC) determined the use of the Turbex™ foam generator was necessary to bring the fire under control. The UM requested permission from the VO to apply the Turbex™ underground.

At **0210hrs** Mr Stone arrived on site and reported to the Control Room. A current situation report was provided by The UM including firefighting activities, self-escape status, gas monitoring information, etc. a timeline of the UMs activities and actions are outlined in appendix 7.

What worked well

- UM was provided clear direction to responding CMWs and confirmed the directions he gave to personnel.
- UM had a good understanding of the mine layout and conditions which escapees may encounter.

Areas for improvement

- Consider allocation of a single resource to specifically focus on escaping CMWs to a place of safety, and gain confirmation of status of all personnel. This single resource can also ensure that a clear communication status is obtained from personnel during egress.
- Once resources for response to the fire emergency are determined, consider removing all other CMWs to the surface of the mine, as soon as reasonably achievable, to be accounted for by the tag board attendant.
- Communication of gained intelligence by the UM and CROs to the IMT could be significantly improved via a real time electronic information management system.
- Equally, actions required by the IMT, or approvals required to carry out a particular action or tactic would also be significantly improved via a real time electronic information management system.

Incident Management Team

Assessors: Ernest Gosk and Cheyanne Stevens

At 0221hrs Mr Stone took control as Incident Controller, issued vests and leadership positions of functional areas

- Deputy Incident Controller
- Planning Coordinator
- Operations Coordinator

Logistics Coordinator Mr Stone established the 'Mission' or 'objective' for the IMT and all other functional areas. a timeline of IMT activities and actions are outlined in appendix 9.

What worked well

- 'Battle boards' in the IMT Room, clear, preset, and practical.
- Updated to external agencies by the Incident Controller, consistent and factual.
- Incident Controller managed the situation well, clear and concise in providing instruction.
- Layout of the IMT room and the duty card boxes were done well and convenient for use

A complete timeline is outlined in appendix 8.

Areas for improvement

- Consider Implementation of a computerised workflow system, there was evidence of miscommunication, double ups, incorrect actions were evident at almost every meeting.
- Fatigue for IMT members began to set in at 7am, there was no consideration for alternate people to change out positions in the emergency management structure to sustain the continuity of the IMT and other functional areas beyond 12hrs.

- IMT meetings were not sufficiently disciplined and structured which affected the effectiveness of communication between the IMT and functional area.
- Although duty cards were issued it was not evident, they were effectively applied or review by the duty card holders. This can contribute to breakdown of IMT and other functional areas processes and key actions

Recommendations

Mine

- Consider Implement a computerised incident management system to facilitate the communication of information in and out of the IMT.
- Review effectiveness of the structure and process for conducting IMT meetings to ensure accurate information management within and external to the IMT.
- Review the mines IMT and functional area alignment with the MEMS process including sustaining IMT over a protracted emergency and currency of competencies for personnel required to perform functions within the IMT and associated functions.
- Consider the early initiation of a QMRS response and risk management process to provide a parallel and prepared contingent resource if the mines resources become overextended.

Industry

- Implement a computerised incident management system to facilitate the communication of information in and out of the IMT.
- QMRS to review their process to ensure suitability qualified personnel are deployed to respond to emergencies, alternate positions must be adequately supported.

Figure 11 IMT room and meeting

Planning group

Assessors: Les Marlborough and Nikky Labranche

The Planning Room was in the main administration building located adjacent to the VO's office. The room had a long table with mine plans on the table with Perspex covers over the plans so that whiteboard marker could be used to mark on plans

As the exercise developed the planning team increased to up to 10 people. Included Tech Services Manager (arriving 0225hrs) followed by the Tech Services Superintendent, Project Superintendent, Ventilation Officer, Mining Engineer (by 0300hrs). The ISHR arrived at 4:00am and predominately remained in the planning area. A scribe was assigned mid-way during exercise.

Further, a very beneficial role in the planning team was the participation of an experienced technical mining person (Undermanager in charge) who has extensive operational experience and holds mining statutory qualifications. UM in charge operational experience and knowledge was very useful for the planning team to challenge and "sanity check" proposed strategies and tactics that would be recommended to the IMT for approval.

A complete timeline is outlined in appendices 9 and 10

What worked well

- Recognised the off-scale CO immediately at 50ppm real-time and 1000 ppm tube bundle
- Discussed and set objectives in IMT
- Kept IMT meetings brief and to information sharing, didn't get lost in the detail
- Planning had their own meetings to relay information effectively to the team and set tasks
- VO understood the mine ventilation system and was competent to run ventilation models very quickly.
- Planning team worked towards achieving what they were requested to do and were very focussed.
- IMT established Objectives very early in the exercise and returned to these at each subsequent IMT meeting.

Areas for improvement

- White boards in planning room were not utilised at all throughout the process.
- Planning Team did not establish their objectives on the planning room whiteboards.
- Planning room not well signed so people understood where it was.
- Limited support for the Ventilation Officer. Trying to run ventilation models, analyse gas results, providing information to QMRS, develop ventilation options for IMT and numerous other tasks.

- Consistent inaccurate information provided to Planning Team during the exercise including CMW locations.
- Management of vehicles getting onsite. There were long delays at the gate which affected the ability to get gas bags
- ISHR briefing- took 2 hours to get a briefing and it was still missing much of the primary information
- Underground personnel tried to open doors inbye the fire without consulting upstairs or risk assessing what that would do to the ventilation plan
- Mine relied a lot on asking assessors for information instead of collecting information from relevant areas.
- Succession planning for subsequent shifts was briefly mentioned, but no actions were undertaken for planning.

Recommendations

Mine

- Review MRAS data required by QMRS for deploying rescue teams to ensure that this data is routinely covered in the mine's gas monitoring system.
- Review the use of an electronic system for emergency management and to provide training to relevant people on its use in an emergency.
- Review people on all shifts who are trained in taking bag samples from tube bundle system to ensure there are sufficient people on each shift capable of doing so.
- Review access requirements to tube bundle areas on back shifts when access gates to these areas are locked and surface people must be organised to attend and open the gates to allow access.
- Consider whether there are sufficient people on all shifts who can operate the gas chromatograph.
- No evidence of information from debriefs being circulated to Planning Group. The Mine should develop a system to communicate information obtained from debriefs to the IMT and various emergency management teams. This process could also be improved via an electronic emergency management system.
- Recognise Mines Rescue as a resource and start preparing the MRAS information earlier

Industry

- QMRS need to review MRAS system to streamline the process for re-entry or deployment of mines rescue personnel. For example, there were already people underground fighting a fire and yet the QMRS MRAS system delays deploying teams to assist and take over the

fighting of the fire.

- External agencies, such as inspectorate, ISHRs, and QMRS, were observed not to attend the mine in a timely manner and did not remain on site until the exercise was stood down, as they would under a live emergency situation. This needs to be considered and communicated as part of the learnings from this exercise and recommend that the Chief Inspector of Coal Mines informs these agencies of the expectation.

Operations coordinator

Assessors: Peter Stigwood and Stephen Smith

At the initial IMT meeting,0221hrs, the Operations Coordinator was appointed.

The initial actions assigned to the operations group were to appoint an evacuation coordinator and account for all CMWs.

The Operations Coordinator then met with all members of the operations group issued relevant duty cards and set up the operations room.

The Operations meeting room was in the main meeting room of the Outbye offices.

A complete timeline is outlined in appendix 1.

What worked well

Operations worked well together as a team and Operations Coordinator effectively assigned sub-roles. Persons in those roles were well rehearsed in what their responsibilities were and the actions that were assigned to them, they often had to make their own decisions however would manage the decision up if the decision was above their level.
Resources were assigned with relative ease, and handover from IMT to operations group was excellent albeit manual handwritten notes taken during the IMT meetings. Meetings were always held after and before IMT meetings which was excellent to see as critical information was able to be relayed back to IMT. Operations controller was well trained and focused on the tasks given to him by the Incident Controller, he did not lose focus or create own goals outside of the missions.

Communication between the Operations Coordinator and Undermanager in the control room was inefficient due to inconsistent and unreliable communication methods such as information passed from person to person, and at times inaccurate or misinterpreted when communicated verbally or handwritten notes.

Recommendations

Mine

- Emergency management software is strongly recommended to ensure accuracy and efficiency of critical incident response and self-escape information can be accurately recorded and effectively communicated.
- Consider a standalone Emergency response tag board for personnel requiring entry into

the mine to respond to the emergency, once the tagboard has been quarantined.

- Persons should have the time to read their duty cards once assigned their roles, no matter how familiar some IMT members may be
- Consider maintaining pre-made tags for QMRS members (even ones that can be handwritten on) to avoid response delays.

Logistics

Assessors: Gareth Kennedy and Jason Hill

Two assessors were deployed with the Logistics IMT Team during the Oaky North Coal (OCN) Mine Level 1 exercise. The normal night shift staff were on site prior to the exercise. The exercise commenced at the surface once the Control Room was notified of an incident and sounded the emergency alarm at 0112hrs. The SSE arrived on site at 0210hrs. The IMT was formed at 0221hrs.

The Logistics Controller (LC) arrived on site at 0233hrs, and the Logistics IMT team was formed at 0234hrs. Initially 4 persons were part of the Logistics IMT team. The security box, radios (x3) and keys were collected at 0240hrs. Additional Logistics team members were called at 0245 and the full team was established by 0320hrs, including sentries and security staff. Details of the incident and events during the exercise are provided in the table below.

A complete timeline is outlined in appendix 13

What worked well

- All members of the Logistics IMT Team were highly professional and worked together well throughout the exercise.
- Each team member understood their respective roles clearly.
- The Logistics Team meeting room was set-up particularly well prior to the exercise.
- All information was up to date (mine plans, risk assessment documents etc)
- The equipment, whiteboard / information-wall in the room set up was more than adequate.
- The use of comms and IT equipment for quickly sharing information was well utilised.
- It was clear the Logistics Team were prepared for incident response and understood their processes well.

Areas for improvement

- While noting good use of IT resources were utilised to share documents quickly between meetings, the process was still quite manual in data entry etc. Multiple persons were editing single word documents and re-typing information from printed documents. Version control may become an issue. It would be beneficial to consider using modern cloud-based, team collaborative solutions in the future (e.g. Microsoft 365 tools).

- There was some confusion over site access at the main gates and traffic control in certain instances, a small number of personnel were able to gain unintended access without restriction, and others (e.g. mines rescue staff) drove to the incorrect location. Suggest deploying more personnel early to direct traffic and provide security / sentry access at gate(s).
- Deploy security near the portal in the exclusion zone. The exact location was unclear at the start of the exercise.
- The QMRS list of personnel needs updating.
- It would be useful to have a staff resource available for the warehouse, and to remain contactable through an incident response.
- Updates of key resources (staff, vehicles etc) in terms of location and availability to be accurately updated. This information was kept on a whiteboard but not always updated. Consider the benefit in using digital whiteboard or live sharing of information.
- The incident management response overall would benefit from an electronic information management system (e.g. MEMS or similar) to improve efficiencies and reduce human errors.

Recommendations

Mine

- Consider a more efficient electronic emergency management system (e.g. MEMS or similar), and other collaborative tools (e.g. Microsoft Sharepoint site or similar) to reduce human error.
- For personnel arriving at site in response to the incident, consider improved signage for directing staff and/or having more mine personnel available to direct traffic. More security/sentries needed earlier in the response process.

Industry

- Further knowledge sharing between sites would be advantageous. Consider providing inventories to neighbouring of relevant emergency response related equipment and stock (e.g. foams, gas cylinders, gas analytical equipment).

Queensland Mines Rescue Service (QMRS) operational response at surface

Assessors: Jason O'Connor and Shaun Dando

At the first IMT meeting the mine initially placed QMRS on standby and did not request a full rescue team mobilisation until approximately 3 hours after the commencement of the incident, approximately 0355hrs.

However, QMRS did deploy an individual Operations Manager to site who arrived at 0300hrs. There was no other Operations Manager deployed to the mine throughout the exercise.

The Operations Manager individually liaised with, and moved between, the mines IMT Planning and Operations teams obtaining information and responding to requests from site personnel. Further, the Operations Manager was receiving and responding to phone calls from the Dysart rescue station, which required the exchange of information and decisions that had been made on site.

QMRS emergency response protocols require at least two Operations Managers are deployed to a mine site to manage a mines rescue response. The absence of an additional Operations Manager/s on site resulted in an excessive workload for the attending Operations Manager which contributed to ineffective application of QMRS risk management practices and therefore ability to deploy teams underground.

However, an authority to enter and captain's task sheet was developed by a QMRS training officer stationed at the sites rescue substation. These documents were collected by the Operations Manager and presented to the site SSE/UMM for review and signing. On review of documentation, it was found that whilst the authority to enter was signed by QMRS and Incident controller the captains task sheet was signed by the QMRS official only and not signed by the Incident controller.

A complete timeline is outlined in appendix 13.

What worked well

The briefing provided by the mine VO was very concise and provided essential information that would have been required by a team who were being deployed in a real event.

Rescue teams utilised a white board in the rescue station to start to record the information provided during the team briefings and updated as new information was provided.

Utilisation of the rescue T card system enabled substation coordinator to identify who was on site and to group team members into teams.

Recommendations

- QMRS should review the effectiveness of deployment procedures for Operations Managers when notified of an emergency at a mine which may require the response of mines rescue team members.
- QMRS should review the resourcing requirements required during an emergency at a mine

to effectively apply the defined risk management process for mines rescue teams to deploy and remain underground.

- Further, QMRS should review the resourcing requirements to efficiently deliver team deployment procedures and relevant information during an emergency response at a mine e.g., Captains Task Sheets, Gas monitoring data and TARP status, Authority to enter.
- QMRS should conduct a review or audit for each underground coal mine to determine if the operational procedures developed by QMRS can be effectively applied to carry out mines rescue services at the mine.

Figure 12 QMRS Staff preparing team deployment documents in OCN sub station

Social and main stream media

Assessor: Theodore Georga

An important element of any emergency response is to ensure that next-of-kin of any injured or affected workers are informed in a timely manner. Social and mainstream media can adversely impact that process and can cause increased distress for family members and friends of workers affected by emergency situations. Mainstream and social media discussion can also serve as a distraction during an emergency and must be managed appropriately to ensure that the focus remains on the health and safety of affected workers.

The assessor attempted to recreate a simulation of the potential reaction to the emergency situation and response on mainstream and social media. The scenario was designed to test the mine's ability to:

- notify next-of-kin in a timely manner
- communicate accurate information to the media and public
- correct misinformation.

The scenario also tested the response of Resources Safety and Health Queensland.

The elements of the scenario were communicated to the mine's corporate communication team and to the Resources Safety and Health Queensland media team using publicly available contact information. Simulated mainstream and social media scenarios were used by the assessor to communicate the elements of the scenario. No external media or social media channels were used, and scenario elements were sent to nominated contacts via email.

Responses were provided to the assessor via email.

What worked well

The assessor felt the following worked well:

- Notification of next of kin was treated as a priority. Good engagement with contracting company.
- In-person support was provided to injured worker while in hospital.
- Transport to hospitals and support was arranged for next of kin.
- Responses to media did not divulge sensitive or personal information about injured or missing workers. Information was updated throughout the exercise in a prompt manner.
- Having a procedure/script in place for dealing with media/family members arriving on site or calling by phone.
- Good communication between IMT and corporate communication ensured responses to enquiries was up-to-date and accurate.
- Plan to engage EAP to establish "drop-in" support in Tieri.

Areas for improvement

The assessors identified the following areas for improvement:

- Information provided by RSHQ to a media response reported that, “All other underground workers have been accounted for and the fire has been extinguished”. At the time a worker remained underground and was in the process of being recovered.
- Communication between the mine’s corporate communications team and Resources Safety and Health Queensland is strongly advised to ensure accuracy of information and communication provided to the media and public.
- The mine’s approach to social and mainstream media was to provide brief, pre-prepared statements and not to engage more broadly with social media posts or mainstream media enquiries. While there are positives and negatives to this approach from a corporate communications perspective, it may allow misinformation to be propagated. While it could be assumed that the media statements would be shared by the community, this may not happen in all instances and may allow misinformation to spread.

Resources Safety and Health Queensland (RSHQ) Mines Inspectors

When an emergency occurs at a mine involving a High potential Incident (HPI) or serious accident prescribed by the Queensland Coal Mining safety and Health Regulations 2017, RSHQ Inspectors will attend the mine to perform their functions i.e., to provide the advice and help that may be required from time to time during emergencies at coal mines that may affect the safety or health of persons.

RSHQ and Inspectors participate in Level 1 emergency exercises to test RSHQ's emergency response system for effectiveness and identify areas for improvement. The following is a summary of RSHQ's participation.

- The SSE contacted the IOM at approximately 0200hrs informing of the emergency Exercise. The IOM was in Emerald for other work commitments.
- At approximately 0300hrs the IOM had obtained further information regarding the emergency then escalated the information to the Rockhampton Regional Inspector of Mines (RIOM) who initiated the RSHQ emergency management system.
- Due to personal safety considerations the IOM departed Emerald in daylight and arrived at OCN at approximately 0800hrs. No other IOMs deployed to site from other locations.
- The IOM requested and obtained information and data from Members of the IMT soon after arrival.
- A dedicated room for RSHQ meetings and activities was allocated by the IMT. The IOM communicated with the RSHQ IMT, located in Brisbane, by mobile phone providing information and data verbally. Advice and requested actions by RSHQ IMT were also provided verbally by phone.
- From review of provided information the IOM determined that the risk management process and supporting evidence, at that time, was deficient and did not demonstrate an acceptable level of risk for the deployment of mines rescue teams inbye the incident site. This judgement concurred the Incident Controllers position at that time.
- The Incident Controller continued to provide the IOM with regular situation updates in between IMT meetings. The IOM maintained verbal communication with the RSHQ IMT until the end of the exercise.

All recommendations

These recommendations have been made with the aim of encouraging continual improvement in Queensland's coal mines and emergency response capability. Appendix C identifies matters for consideration when conducting future emergency exercises.

The recommendations have not been ranked in any order of priority. All mine sites and other agencies should review the recommendations and should use them in the gap analysis of their emergency response systems, as well as audit tool prompts. Most of the recommendations are not specific to OCN but are applicable to all coal mines and were identified as issues during the 2021 level 1 exercise.

Many of these recommendations have been made in previous level 1 reports. Industry has not acted upon these to improve training for CMWs and establish effective emergency response systems with appropriate equipment and software. Having equipment and software available is of no use if the CMWs do not have a level of skill and knowledge to enable them to use the tools effectively. (CMWs in this sense refers to everyone at the coal mine).

The numbering system being used is derived from a spreadsheet first established by Mike Caffery as gap analysis between level 1 exercise recommendations and coal mine emergency response schemes.

As this is the 24th level 1 exercise, the primary number is 24.

For the mine and Industry

24.01 First response firefighting

a. Ensure basic firefighting training includes the use of firefighting equipment for all classes of fire and the best medium to fight them.

b. Ensure the potential ramifications of using high expansion foam without modelling the outcome is understood.

c. Ensure limitations of firefighting equipment is understood e.g. Running 350m of hose lines can cause excessive pressure drop and consider using 64mm hoses to allow for maximum flow of water over a longer distance.

d. Conduct basic fire training for all CMWs as part of ongoing skills maintenance.

e. Conduct smaller firefighting scenarios on regular basis on each crew.

24.02 First response first aid

The mine and industry should review if their first aid training scheme involves,

a. Basic First Aid training for all CMWs.

b. Effective secondary surveys of patients to identify non-obvious injuries.

c. Maintenance of knowledge for contents of first aid/trauma kits and first aid room.

d. Practice in the use of some less common equipment such as vac splints and blood pressure cuffs.

e. Conducting simple first aid scenarios regularly within groups to help people deal with incidents including more regular familiarisation with provided equipment.

24.03 Self-escape

All underground coal mines should ensure the following elements are integrated into self-escape training scheme for CMWs

a. Conduct a proportion of training in the underground environment including donning and changeover of breathing apparatus in simulated restricted visibility.

b. Self-escape training should involve varied practical self-escape scenarios underground including walking via alternate escape routes.

c. Self-escape training should provide varied physical activities when wearing breathing apparatus to provide experience and knowledge for CMWs to understand their physical and equipment limitations.

d. Self-escape training should include more regular desktop exercise analysis with diverse scenarios including potential aided escape situations for incapacitated crew members.

e. Self-escaping training should include testing CMWs ability to self -escape without the assistance of the ERZC.

f. All Underground coal mines should review the strategy of refuge for CMWs where self-escape or assisted escape from a mine is unachievable during an emergency.

24.04 Verification of CMW location

a. All mines need to utilise a real time coal mine worker tracking solution that reliably provides capability to identify location of people underground and on surface.

24.05 Emergency response risk management

a. All underground coal mines review their SHMS to determine if effective controls and risk management processes are implemented to determine if risk to CMWs remaining underground to respond to an emergency is at an acceptable level.

b. All underground coal mines ensure that the requirements to support the operational procedures for QMRS to carry out Mines Rescue services during an emergency at their mine are implemented into the mines SHMS, notably the information and data requirements to support the QMRS risk management processes.

c. All Underground mines review the effectiveness of triggers for the initiation of a Mines Rescue response and take into consideration potential response times and contingencies for resources before an incident escalates.

24.06 Implement a computerised incident management system.

a. Utilise emergency management technology solutions that provide capable of maintaining status of the emergency, objectives, and action tracking in real time between all Duty Card Holders, key stakeholders, and those off site to facilitate active and informed emergency management.

b. Briefing and Handover of emergency to oncoming CROs needs to be documented and approved to ensure accuracy of data and current objectives and actions are communicated. (It is noted however it was done verbally between CROs in the 2021 Level 1 exercise)

c. Review effectiveness of the structure and process for conducting IMT meetings to ensure accurate information management within and external to the IMT.

d. Review the mines IMT and functional area alignment with the MEMS process including sustaining IMT over a protracted emergency and currency of competencies for personnel required to perform functions within the IMT and associated functions.

e. Mines should develop a system to communicate information obtained from debriefs to the IMT and various emergency management teams. This process could also be improved via an electronic emergency management system.

f. Review the resourcing of the control room, both people and technology, during an emergency with a view of establishing the control room as an effective intelligence unit providing reliable and timely information to the IMT.

24.07 Mines gas monitoring systems

a. Review MRAS data required by QMRS for deploying rescue teams to ensure that this data is routinely covered in the mine's gas monitoring system.

b. Review Environmental Gas monitoring requirements and TARP actions for CROs and those responsible for managing an emergency must take to validate environment conditions underground. This should cover the situation when sensors have reached limits and flat lined. This will ensure true environmental conditions are established and validated to ensure risk based informed decision making can be made before continuing to allow CMWs to remain underground or conducted in seam firefighting by crews.

c. Use electronic gas reporting that captures real-time acknowledgement and by whom, actions taken and generates active alarms at start of each shift. Remove paper based manual transfer of data to limit human error.

d. Review people on all shifts who are trained in taking bag samples from tube bundle system to ensure there are sufficient people on each shift capable of doing so.

e. Review access requirements to tube bundle areas on back shifts when access gates to these areas are locked and surface people must be organised to attend and open the gates

to allow access.

f. Ensure that enough competent trained CMWs are available on all shifts to operate the gas chromatograph.

24.08 Level 1 exercise response

a. Industry needs to treat a level 1 Exercise in the same manner as they would a real emergency. This is not a pass or fail test. Too many groups treat the exercise almost like a Mines rescue Competition and there is not the urgency shown as would be expected from a real emergency.

24.09 Mine site rescue coordinators

a. Initiate of an early QMRS response to provide a parallel and prepared contingent resource if the mines resources become overextended and take into consideration potential response times and contingencies for resources before an incident escalates.

b. Recognise Mines Rescue as a resource and start preparing the MRAS information earlier.

c. Establish a standalone Emergency response tag board for personnel requiring entry into the mine to respond to the emergency, once the tagboard has been quarantined.

d. For personnel arriving at site in response to the incident, consider improved signage for directing staff and/or having more mine personnel available to direct traffic. More security/sentries needed earlier in the response process.

e. All Mines Rescue Coordinators to consider a site-specific task card or checklist that details the process of preparing and setting the Mines rescue substation up to receive multiple team members and equipment in the case of an emergency response requiring Mines Rescue. Consider how the Substation will flow and:

    i. clearing of excess equipment,

    ii. where equipment will be tested and prepared,

    iii. process to provide accurate and up to date incident information (e.g., whiteboard or screen) to Substation Coordinator and team members,

    iv. location for arrival of team members and kit bags,

    v. location for arriving equipment

    vi. briefing rooms

    vii. designated staging area prior to deploying.

f. All Mines Rescue Coordinators to familiarise Mines Rescue trainees on their individual sites with locations of QMRS Duty Card 5 Substation Coordinator, the allocated vest, and any site-specific requirements to manage a mines rescue activation to site.

g. All Mines Rescue Coordinators to have pre-prepared Mines Rescue visitors personal tags

that can be allocated and used in a deployment or in training, and only require updating of name, lamp and SCSR number.

h. Sites to include actions or prompts in emergency duty or task card system to ensure sufficient personnel are allocated to pre-prepare and allocate cap lamps, SCSRs, (and potentially wi-fi phones, additional gas detectors) for Mines Rescue teams to improve efficiency and timeliness of deployment.

i. Further knowledge sharing between sites would be advantageous. Consider providing inventories to neighbouring of relevant emergency response related equipment and stock (e.g. foams, gas cylinders, gas analytical equipment).

24.10 Queensland Mines Rescue Service

a. QMRS should review the effectiveness of deployment procedures for Operations Managers when notified of an emergency at a mine which may require the response of mines rescue team members.

b. QMRS should review the resourcing requirements required during an emergency at a mine to effectively apply the defined risk management process for mines rescue teams to deploy and remain underground.

c. Further, QMRS should review the resourcing requirements to efficiently deliver team deployment procedures and relevant information during an emergency response at a mine e.g., Captains Task Sheets, Gas monitoring data and TARP status, Authority to enter.

d. QMRS should conduct a review or audit for each underground coal mine to determine if the operational procedures developed by QMRS can be effectively applied to carry out mines rescue services at the mine.

e. QMRS to review Level 1 exercise involvement including ALERTS communication system, to identify improvement opportunities. Feedback from several Mines Rescue team members indicated some had difficulty with responding to the ALERTS callout, including contacting personnel on the designated contact number.

f. QMRS and Mines Rescue Coordinators to identify, and regularly communicate to all team members, the requirements and expectations on where and how to access each mine site when responding to an emergency or planned exercise. Some delays were experienced by team members accessing the mine site.

g. QMRS to review frequency and content of training on the use of QMRS Duty Card 5 and Resource Management Board system. Include improvement opportunities identified in emergency exercise such as any information that is required to be updated after the initial filling out of T Card's.

h. QMRS to review and identify if there are any alternative more efficient options when managing team member and resource movements. This may include arrival to substation,

confirming team member status (current medical and training records, technical support etc). Consider any technology that may assist such as electronic swipe ins, alternative T Card systems, tablets or similar.

i. QMRS to identify, communicate and reinforce areas for improvement identified in emergency exercises and active deployments during scheduled training rounds.

j. QMRS to consider further training to specifically highlight when teams are travelling in a vehicle inbye of FAB, including distances that can be travelled, designated return triggers, process for two-minute stop, communication challenges.

k. All team members to confirm they have adequate personal equipment such as helmets, cap lamp belts etc available to respond to an emergency either from home, camp, or site. Ensure QMRS team member identification is also available.

l. QMRS to review and communicate process when a fixed communication device is not operational or found to be in place at the designated FAB. Include alternatives that can be used if available. If deciding to utilise any site-specific mobile communications determine how this can be communicated so that it is prepared and ready to go with teams on deployment without causing unnecessary delays. Consider the reliability of Wi-Fi coverage.

m. QMRS need to review MRAS system to streamline the process for re-entry or deployment of mines rescue personnel. For example, there were already people underground fighting a fire and yet the QMRS MRAS system delays deploying teams to assist and take over the fighting of the fire.

24.11 Industry safety and health representatives

a. ISHRs responding to the event should remain on site as they would in a real emergency rather than leaving before the exercise was completed to do other work not related to the exercise.

Appendices

- Appendix 1 Incident Site Timeline
- Appendix 2 DSEM Timeline 1
- Appendix 3 DSEM Timeline 2
- Appendix 4 MG705 Dev Timeline
- Appendix 5 LW704 Timeline
- Appendix 6 CRO timeline
- Appendix 7 Undermanager Timeline
- Appendix 8 IMT Timeline
- Appendix 9 Planning Timeline 1
- Appendix 10 Planning Timeline 2
- Appendix 11 Operations Timeline
- Appendix 12 Logistics Timeline
- Appendix 13 QMRS Operations Manager Timeline
- Appendix 14 QMRS Rescue Team response timeline
- Appendix 15 Underground assessor briefing notes example DSEM Observers
- Appendix 16 Surface assessor briefing note example

References

- Queensland Government *Coal Mining Safety and Health Act 1999*
- Queensland Government *Coal Mining Safety and Health Regulation 2017*
- Queensland Government *Recognised Standard 08 Conduct of Mine Emergency Exercises*
- *Report on an Accident at Moura No. 2 Underground Mine on Sunday, 7 August 1994*, Windridge, F. W., Parkin, R.J., Neilson, P.J., Roxborough, F.F. & Ellicott, C.W. 1996: Wardens Inquiry, Queensland Government

Appendix 1 Incident Location Timeline

Time	Location / Incident Site	**Action / activity**	**Key decisions / comments**
0059	13c/t ERL	• Rob Fowler notified CRO of damage to the underpass at 13c/t	•
0110	C HDG 11-10c/t	• Shane Myers calls on the DAC to say that there has been in collision with 2 injuries and an ensuring fire then does not speak again	• CRO continues to try and communicate to stie
0121	12c/t B HDG	• An Operator S Drake walks past the no road from outby from the underpass at 13c/t. he is met by the assessors and told that there is thick smoke and to go back and call control with that information.	•
0127	10-11 C/T C HDG	• Belts off	•
0130	10-11 C/T C HDG	• Heard report on DAC of smoke at 34 C/T B and D Hdg	•
0131	10-11c/t B HDG	• A Morris arrives from outby and is shown a picture of the scene and told that the radiant heat from the fire is too great to enter 12c/t. they retreat to a safe location	•
0135	10c/t B HDG	• A loader arrives with a fire substation from the surface	•
0137	10c/t 10-11 C/T C Hdg	• Fire line being run from the hydrant at 10c/t to a dividing breaching piece then 1 fog and 1 jet • Andy Morris ERZ Contoller arrives at casualty site and assesses casualty.	• Hoses were walked out instead of bowling, there is nothing in the roadway to stop bowling. When water was turned on there was many knots in the hose that caught peoples hands from the water pressure when they tried to untangle them • Did not flush the hydrants • Use care when running out hoses as there

Appendix 1 Incident Location Timeline

Time	Location / Incident Site	**Action / activity**	**Key decisions / comments**
			was a number of damaged female BIC fittings that caused issues later in the fire fighting activities • Andy Morris assessed injured CMW in Belt road. He checked their pulse but did not time it. He checked if it was irregular ,strong or weak. He also asked the injured CMW about his injuries and also asked for information about the nature incident, location of incident and nature of injuries to the other CMW. Good reassurance made to Injured CMW when Andy went forward to investigate the fire and incident scene
0140	11c/t	• Started running out hoses to advance the end of the hose to the 11c/t hydrant	• This hydrant was tagged and the operator did not check for water pressure by flushing before running our all the hoses (waste of time and energy)
0142	10-11 C/T C Hdg	• C.MW arrives with First Aid Kit to assist injured CMW with burns. ERZ Controller directs CMW to assist Injured CMW with first aid.	• CMW was not first aid trained and was unsure of what to do and what was in the First Aid Kit. No secondary surveys done of CMW with burns. Assessor gave coaching to First Aider of what to do and started to irrigate the burns with Saline Solution. CMW providing First Aid did reassure the CMW very well.
0147	11c/t	• Operators putting up a water curtain to give access into the injured at 11c/t. ambulance	• Managed fairly well by the spotters

Appendix 1 Incident Location Timeline

Time	Location / Incident Site	**Action / activity**	**Key decisions / comments**
		reverses down the road and backs into 11c/t	
		• Casualty with broken leg located and treatment started First Aider Clinton from Workshop	• Relaxed when realised he was breathing even though it was painful and leg was badly broken
0150	11c/t 10-11 C/T B HDG	• Operators trying to change over branches, but hoses damaged and this is difficult • First Aider removes casualties shirt with medical shears	• Do not drag or run over hoses of fittings • Continuation of Irrigation of Burns. Still no Secondary Survey performed on casualty.
		• 1st set of obs taken on ROB using blood pressure cuff and fracture being treated • Secondary survey done but missed abdomen and chest	• Consecutive work being done and not relying on one person to do everything
0153	10-11 C/T B Hdg	• ERZ Controller arrives back to check on injured CMW.	• ERZ Controller and First Aider assists injured CMW to egress to 10-11 C/T B Hdg
0155	11c/t	• Experienced people being swapped out from firefighting to bring up the foam generator	• No rescue personnel at scene at this point • There seemed to be prior knowledge that low expansion foam would not be effective
		• 2nd set of obs done on ROB	• Called for AMBULANCE to be relocated closer for loading casualty into it and accessing equipment
0157		• Fitted vac splint • Treatment continuing for CMW with Burns.	• Fitted incorrectly but it was still effective, stepped around casualty and not over him
0204	11	• The order was given to hook at the hi ex foam generator	• Assessor asked if permission had been given to use the generator.

Appendix 1 Incident Location Timeline

Time	Location / Incident Site	**Action / activity**	**Key decisions / comments**
			• The low expansion branch was available but not used
0205	11	• 2 x operators walk out of 11c/t from the belt road with CABA and head outby	• Blanket sourced for casualty with burns.
0207	B 10	• First Aider arrives to take over treatment of CMW with burn injury	• ERZC delegated trained first aider to take over treatment. Good patient hand over performed.
0208		• Casualty ROB packaged in the basket stretcher and then into ambulance	• Good communications and clarification of what was happening and what each person was doing good control
0215	11c/t	• 3rd set of obs taken for ROB on the way out	• Realised that Entonox couldn't be used as he was unconscious oxygen given using therapy mask and 8lpm
0217	11	• A gas detector is brought to the fire site and used to measure for any gas at the scene	• This remained at the site
0220	B 10	• Drifty arrives to transport CMW with burns to surface.	• ERZC directed SMV to be used to transport the injured CMW out of the mine. No trained first aider sent out with injured CMW but was escorted by another CMW to monitor casualty.
0225	11	• ERZ checking the velocity in B HDG	•
	Travel road headed outbye	• 4th set of obs taken and found SPO2 and fitted to ROB gave Entonox as ROB was conscious pain was 11	• Didn't assess chest and difficulty breathing as possible reason not to give entonox
0228	11	• Low expansion foam is being set up to apply to the fire using an extra fire line	• This is connected to the wrong hose and water is turned onto the wrong hose and not the branch

Appendix 1 Incident Location Timeline

Time	Location / Incident Site	**Action / activity**	**Key decisions / comments**
0234	11	• Water is applied to the low expansion branch	• There are 3 hoses now applying water to the fire from one 38mm feed hose, this pressure drop does not allow for foam to reach the loaders
0234	11	• Turned off foam to run an extra hose out	• Jet nozzle was washing the foam that had need applied away
	First Aid Room	• Casualty Rob located to First Aid Room and handed over to Tim in the room	• Good handover form Clinton to Tim with exchanging obs sheets and actions. Not really familiar with First aid room layout and equipment
0238	11	• Permission is given to use the hi ex generator	•
	First Aid Room	• Doctor Arives and assists, called for canulation and IV for blood loss and pain relief	• Doctor wasn't familiar with skills of site personnel and the room. Doctor requested BSL to be taken and conducted secondary survey
0240	11	• Hi ex generator is started	• They are using blue hi ex drums of foam which do not seem to be very effective
0240	10	• Assessor turns off water and tells the operator that you can hear water running down the pipe range but pressure cant be built up	• The fire had burnt through the pipe work inby but this was not identified for some time
	First Aid room	• Tim located Chest bruising after looking under the shirt after prompt and discussion about why his breathing was painful	•
0247	First Aid Room	• Casualty Handover to Doctor	•

Appendix 1 Incident Location Timeline

Time	Location / Incident Site	**Action / activity**	**Key decisions / comments**
0250	9	• Water hoses are run to 9c/t but they are told that there is not pressure there	• Hydrant is not tested
	First Aid Room	• 5th set of obs taken • Doctor conducts secondary survey of burns Casualty	• SAMPLE questions asked and recorded • Doctor advised he would issue pain relief to burns casualty. Doctor gained information from injured CMW. Observations taken and wet dressing applied.
0255	8	• Water hoses are run to 8c/t but they are told that there is not pressure there	• Hydrant is not tested
0256	8	• Operator decides to run water from the belt road pipe range at 8c/t	• Hydrant is not tested
0258	8	• Water is turned on	•
0300	First Aid Room	• Both Casualties handed over to QAS	•
0302	11	• Water on but minimal water pressure	• Over 300m of hose causing pressure drop that made firefighting ineffective
0306	11	• The water pipe inby is isolated at 11c/t and pressure is returned to the pipe range outby	•
0307	10	• Breaking fire hose to reconnect to 10c/t hydrant	•
0310	11 First Aid Room	• Water is on from 10c/t but hi ex generator is not operating • Patient handover to Ambulance (called by Martin)	• Fines from the belt road hydrant that was not flushed have blocked the inlet to the generator • Doctor advised his Practice Manager had given him prior warning that he would get

Appendix 1 Incident Location Timeline

Time	Location / Incident Site	**Action / activity**	**Key decisions / comments**
			a call out at 2am.
0321	11	• Inlet is unblocked and foam is being produced again	•
0323	11	• Assessor informed the ERZ that the hi ex generator has stopped working and the roof is bagging inby of 11c/t	• ERZ pulls operators back outby of 11c/t lip.
0325	11	• Jet is used again when the hi ex is turned off	• The use of a jet nozzle displaces the hi ex foam
0337	11	• DSEM crew arrives	• They rotate with the outby crew that are told to take a rest
0350	11	• New fire sub station arrives with hi ex generator and foam	•
0355	11	• Hi ex generator is running again	•
0418	11	• Crew build wall of drums of foam to hold the foam forward	• Brattice that was on site may have been a better option
		• All blue drums are used	•
		• Assessors ask them to use white 1% low expansion drum for trial and it makes better foam	•
0450	11	• Assessor tells ERZ that the roof is poor all the way to the intersection	• Crew pull back to the intersection in a safe location
		• Timbering equipment arrives	•
0505		• 3 prop setters are installed at the lip of in	•

Appendix 1 Incident Location Timeline

Time	Location / Incident Site	**Action / activity**	**Key decisions / comments**
		HDG inby 11c/t	
0506		• Hi ex foam has been turned off	•
0536		• Fire getting under control, team packed up	•

Appendix 2 DSEM Timeline 1

Time	Location – DSEM 1	**Action/activity**	**Key Decisions/comments**
01:37	DSEM	• ERZC shown environmental prompt card • RE: Smoke and 500ppm CO • Instructed be the ERZC to don CABA.	• All CMWs donned in a controlled manner • 3-4 CMWs not parking face mask • ERZC checking each crew member individually
01:40	DSEM	• All CMWs had donned CABA • 1 x CMW selected to go down with an ankle injurie while walking to the drift runer	• CMW played along quite well putting in a show that added value to the exercise. • Injured CMW was braced 2 x CMWs and assisted into the back of the drift runner • The ERZC instructed the crew to take the stretcher from the emergency pod and strap it onto the side of the drifty.
01:45	DSEM	• Leaving DSEM	•
01:50	52 C.T U/Pass EM	• Shown smoke picture and read the environmental prompt note.	• ERZC called the emergency number and talked to the undermanager. • ERZC wanting to investigate – was instructed to keep travelling O/B D Hdg • ERZC updated the undermanger on crew condition and injured CMW
02:00	52 C.T U/Pass EM	• ERZC instructed CMWs to remove CABA • On route to 33c/t	•
02:10	33 C.T	• Arrive at 33c/t	• All CMWs out of the drifty and instructed to don CABA • ERZC read the prompt card 5 times as he was wanting to go through the thick dense black smoke with zero visibility in B,C,D Hdg • He finally realised that A Hdg was his only

Appendix 2 DSEM Timeline 1

Time	Location – DSEM 1	**Action/activity**	**Key Decisions/comments**
			option and instructed the CMWs to carry the injured CMW on the stretcher to the 33C/T CABA Refill station to fill up. • Good communication on the lift and lower with correct rotation as per QMRS training
02:15	33 C.T CABA refill station	• Arrived at the CABA refill station • ERZC entered through the airlock to inspect the return • All CMWs refilled including CMW in stretcher	• CMW reminded other CMWs to turn off the CABA station • ERZC decision to carry injured CMW with the rest of the crew into A Hdg return on the stretcher •
02:20 to 02:50	Entered 33 C.T A Hdg return.	• ERZC directed CMWs to head O/B • Good communication while picking up and lowering the stretcher, rotating correctly as per QMRS training.	• Coal mine workers finding it very difficult to walk with CMW in stretcher • Very fatigued • Breathing heavily in CABA • Walking through ankle deep bulldust into the ventilation • Lowering stretcher and rotating more frequently. • Lifts and lowering of stretcher getting sloppy, not lifting together • Frustration with people not rotating correctly • Tripping whilst carrying CMW close to hitting the floor on two occasions • CMWS made it from 33c/t to 27c/t before I made the decision to call off the attempt to carry the injured CMW out of the pit.

Appendix 2 DSEM Timeline 1

Time	Location – DSEM 1	**Action/activity**	**Key Decisions/comments**
			This was due to the extreme fatigue the CMWs were under and the fact the person in the stretcher was nearly dropped twice. • I had a conversation with the CMWs and ERZC on if they thought they could continue all of them agreed they couldn't they were to physically exhausted. They had made it 6c/t's • For the point of the exercise without any prompting I asked what another option was. The ERZC and another CMW both answered with, we should have left him at 33C/T CABA refill station coupled up and notified the control room. • I then instructed them to let the injured CMW out of the stretcher and continue on for the sake of the exercise. • 02:50 – ERZC Warning whistle went off. • They would not of made it back to 33c/t or onto the next CABA refill station carrying the stretcher they all would of ran out of air. • This was a huge learning outcome for

Appendix 2 DSEM Timeline 1

Time	Location – DSEM 1	**Action/activity**	**Key Decisions/comments**
			myself and the crew involved and should be communicated to the rest of the coal mining community. • A common question asked is if you are self-escaping and there is an injured person what would you do? 90% of CMWs would say they would attempt to get him or her out. • I now know that you would not come close to carrying a person in a stretcher from one refill station to the next. This example should show the importance to make an extremely tough decision to leave a fellow CMW behind in a safe location if possible and self-escape for the sake of yourself and fellow crew members.
02:55	13c/t E/Mains	• Entered the 13c/t CABA refill station (live) pretended to refill	•
02:55 to 03:10	Travelled from 13c/t to 3c/t	• Attempted to open the airlock – too much pressure on the door ERZC instructed to keep moving O/B	• Only 1 x CMW attempted the door before deeming it too hard to get through
03:10 to 03:12	2c/t double door/ regulator	• ERZC attempted to open the doors with the air actuator pull cord	• I waved my light at him and had a conversation with him if this is what he wanted to do, and what would happen if he opened them. • He decided to not open it and head back to 3 C/T

Appendix 2 DSEM Timeline 1

Time	Location – DSEM 1	**Action/activity**	**Key Decisions/comments**
03:12 to 03:15	3c/t airlock	• Had a better attempt to open the door and it opened with great force.	• Found the slider on the O/B door was left open
0315 to 03:20	3C/T B Hdg	• Called the CRO who told him he was in fresh air and to assist the firefighting at 9c/t	•
03:25	10c/t B Hdg	• Instructed by ERZC managing the fire to have a rest	•
03:30	10 – 11 c/t	• Crew made there way to fight the fire and ERZC made comms with CRO	•
03:32	10 – 11 c/t	• Turbex™ turned off and relocated O/B due to change in strata conditions. When they went to turn it back on they were instructed that the turbex was US	• Allot of confusion crew sent back too many people.
03:35 to 0520	10 – 11 c/t	• ERZC instructed the crew to change out • Another fire depot was dropped off that had a new turbex • Turbex™ set up and operational • Timber was taken to the front line 3 props were cut to size and set to the roof	• At least 40 drums of foam were put through the turbex – combination of low and high expansion. • Very unsure of how to measure, cut and set prop – Something that isn't taught these days in any form of training package. Something that could be raised as a recommendation.
0600	End of exercise back to the surface.	•	•

Appendix 3 DSEM Timeline 2

Time	Location – DSEM 2	**Action/activity**	**Key Decisions/comments**
13:20	DSEM crib room	• Crew briefed on level 1 exercise	• Crew all in crib room. All knew level 1 was occurring that shift. Miner not producing. All crew counted for
13:30	DESM crib room	• ERZ notified by CRO that there is a fire in East Mains and there is 2 injured CMWs	• ERZ was instructed by the control room operator to head to the belt road and egress via the belt road. ERZ relayed message to his crew.
13:33	DSEM crib room	• Control room contacted ERZ by phone	• Control room instructed ERZ to drive out as far as possible. ERZ passed message on to crew.
13:35	DSEM crib room	• Gas card shown to ERZ with contamination coming into panel	• ERZ instructed crew to don CABA. NO SCSR used as all at crib room
13:36	DSEM crib room	• Crew don caba under ERZ instruction.	• 1 rescue trained CMW and ERZ check everyone's caba when finished donning. ERZ asked for cylinder pressures
13:39	DESM crib room	• Crew instructed by ERZ to make way to transporter.	• 1 CMW sustains sprained ankle and can not walk. Crew instructed to sit CMW up while another brings the vehicle to them. Injured CMW placed in transporter whilst 2 others remove stretcher from ER pod and tie to transporter. ERZ removed tags from district board before leaving panel.
13:52	52ct East Mains	• Crew arrive at 52ct East Mains and ERZ contacts control room	• Initiated emergency call, erz stated that he would investigate thick smoke instructed to keep traveling out bye crew reminded ERZ to relay information of injury 3 possibly 4 times before cro was advised of injury. ERZ was instructed of vehicle interaction on phone. Was told that he was in fresh air. Crew then instructed to

Appendix 3 DSEM Timeline 2

Time	Location – DSEM 2	**Action/activity**	**Key Decisions/comments**
			remove CABA and travel out bye in vehicle by ERZ
14:04	33ct East Mains	• Crew arrive at 33ct East Mains	• ERZ instructed on what gas readings he would have and what would see as per the photos. • ERZ still wants to head out via d heading and seems confused of where he can and can't go. Every suggestion is denied. The crew eventually yell out to travel via B heading. They are then instructed that travel is via A heading. For this to happen the crew are required to don CABA again. There is still confusion amongst the crew as they remove the stretcher and place the injured CMW into the stretcher. This took 13 minuets alone.
14:18	33ct underpass	• Stretcher carry	• Crew stopped lowered stretcher and completed rotation. at this point stretcher carry was neat and tidy
14:20	33ct CABA re-fill	• Fill CABA	• Crew access quick fill and go thru the motions of re-filling. Once all standing members have filled cylinders the position the injured CMW in front of the quick fill and re-fill his CABA. Whilst this is happening the ERZ checks the air lock into A heading. Crew didn't close door on quick fill they did isolate tho
		•	• The crew are instructed by the ERZ to enter into A heading and start their egress carrying the injured CMW in the stretcher

Appendix 3 DSEM Timeline 2

Time	Location – DSEM 2	**Action/activity**	**Key Decisions/comments**
			whilst under CABA. The crew start off really well and are rotating the stretcher at every cut through. This is when you would think they would check one another condition and check man doors to see if smoke was behind each stopping, neither of these where done.
14:32	27ct A heading	• Crew instructed by assessors to stop the stretcher carry and remove the injured CMW.	• Crew told to stop and think about there condition and would they make next quick fill. Stated they would have left injured in fresh air if they had of considered the effort involved in a long stretcher carry. They were very fatigued after a short carry and each rotation was getting messy. Crew continued on and made there way passed a lot of trip hazards at 19ct. they completely missed 22ct and didn't notice the sign on the floor.
14:50	A heading return	• ERZ warning whistle goes off	•
14:52	13ct east mains	• ERZ called cro	• Instructed that fire is still going and they are still required to travel out via A heading. ER instructed crew to re-fill. Crew went thru the motions of re filling. Crew return to A heading to continue out bye
15:07	3ct east mains	• Crew try to enter air lock in 3ct	• Crew tried to enter doo but could not get it open due to pressure on it. They chose to continue out bye and get turned around at the regulator. They head back in-bye to check other man doors when they are

Appendix 3 DSEM Timeline 2

Time	Location – DSEM 2	**Action/activity**	**Key Decisions/comments**
			instructed to stop and re try 3ct. they attempt the door at 3ct again and succeed. Once thru they relise that the hatch was open on the other side causing high pressure against door.
15:15	3ct B heading East mains	• ERZ finds phone and contacts control room	• Instructed that fire is burning at 9ct and crew asked to assist with extinguishing it. Crew proceeds on foot to fire.
15:20	6ct B heading east mains	• Vehicle picks up the injured CMW and is taken to surface for treatment	• Crew continue to fire
15:25	10ct B heading east mains	• Crews informed of what has happened by outbye erz's on seen	• Told turbex operational and to have a break before swapping others out. Crew remove CABA at this point.
15:30	10ct B heading east mains	• ERZ controller looking for comms to contact control room	• Told control of crew condition, injured on way to surface, informed they are the first production crew to arrive.
		•	• Crew swaps out out-bye operators and takes over fighting fire. Turbex™ is u/s at this point and waiting on another to be transported in from surface. They swap over to low expansion foam 15:40 • With back up fire sub arriving at 15:50.
13:55		•	• New turbex set and operational, continue to use high expansion foam and a few drums of low ex
17:00		• Timber props arrive	•
17:10		• Cutting props	• 3 props cut and stood on edge of poor roof. Props cut to short and are not installed to a good standard. Operation of

Appendix 3 DSEM Timeline 2

Time	Location – DSEM 2	**Action/activity**	**Key Decisions/comments**
			bow saw by 1 CMW at a time.
17:20		•	• Informed that getting on top of fire

Appendix 4 MG705 Timeline

Time	Location – MG705	**Action/activity**	**Key Decisions/comments**
01.25 am	Mg 705 crib room 32 ct	• Phone call from control room to cmw asking for erzc to call control	• CMWs quickly alerted erzc and he rang back through to control
01.28 am		• ERZC on phone with control discussing info about incident and expected gas make in panel	• ERZC alerted all CMWs in crib room to grab caba units and get ready to evacuate panel via transport - there was no instruction from deputy to don caba just to get them out.
01.29 am		• ERZC left crib room to locate and inform remaining CMWs at the face of the situation	• CMWs in crib room began to don caba units and prepare drift runner to leave panel.
01.35 am		• More CMWs began to enter crib room and don caba units	• The donning process was done well by the persons I observed it was smooth and donned correctly and once they had finished they helped each other out
01.37 am		• x2 CMWs from manuplex entered crib room and rang control – instruction from control to evacuate via transport	• The 2 CMWs discussed options and grabbed caba units and donned .
0142	cribroom	• The following environmentals were provided to the ERZC and stated that there was now smoke entering his panel: • CO – 290ppm • CO2 - 0.21% • O2 -20.7% • CH4 - 0.02%	• ERZC now directs all to DON BA (CABA or SCSR) – asks for his *2 x MR trained personnel to be in CABA specifically.*
01.42 am		• CMWs from face arrive in crib room accompanied by erzc	• All persons who had already donned caba assisted other CMWs
		• ERZC accounted for all persons briefed crew on plan moving forward and allocated personnel drift runners	• All CMWs listened actively and followed instructions. ERZC put 2 mines rescue personnel in charge of other two

Appendix 4 MG705 Timeline

Time	Location – MG705	Action/activity	Key Decisions/comments
			transports used to escape
		•	• Transports left crib room
02.00 am	MG705 25ct D Hdg ERL	• Stopped at mines ERL mines rescue trained person checked everyones suit pressures and indicated that if they were low that they would fill up	• All CMWs had good suit pressures and indicated that they would fill up if they needed and that they would phone control
02.15	MG705 3ct D Hdg ERL	• Stopped at ERL	• Found x2 CMWs unaware of situation got them to don SCSR and briefed on situation • Erzc spoke with mines rescue persons on escape strategy then briefed crew , he then made contact with control and let them know all critical info
		•	• Mines rescue personnel checked everyone's condition and suit pressure and indicated that they would fill up if required.
	52ct East mains	• Given information prior to take D Hdg as there was thick black smoke in BHdg, drift runners did not stop to discuss they continued on as instructed.	•
		• Back into drift runner and retrieve all personnel tags from board and continue travelling outbye in d heading primary escape way	•
02.37 am	D-B33 east mains	• Group stopped by thick black smoke unable to continue via transport	• ERZC and x2 mines rescue personnel spoke together then decided to go back to 35 ct and go under belt and go over to b heading caba station. prompted them to

Appendix 4 MG705 Timeline

Time	Location – MG705	Action/activity	Key Decisions/comments
			use 33 ct underpass
02.40 am	B 33 CABA STATION East mains	• Arrived at B33 ERL	• CMWs turned refill unit on connected up and began the refill process. There was no panicking and great communication, crew assisted each other
02.45 am		• Second half of crew arrived at station with sick cmw unable to walk properly being assisted by other CMWs. (the CMW did have to be reminded that he was incapacitated and it was at this point that the Crew stepped in to assist.	• Crew assisted incapacitated CMW to fill up then left him hooked up to caba station after a discussion between the ERZC and x2 mines rescue persons. It was the rescue personnel's idea to leave the injured worker there hooked up, which they pushed heavily and eventually the ERZC agreed. He sat down to discuss this with his ill CMW to explain what was happening and that while he didn't want to leave him it was in everyone's best interest and that someone would be back to get him.
		•	• Other CMWs who had CSR units changed over some were good with the changeover process others clearly needed more training
02.50 am		• ERZC rang through to control asking about fire situation	• Fire still out of control. ERZC informed CRO of the x1 CMW unable to self-escape and that he was to remain at the ERL, hooked up and his location and condition and that we would be heading out via A Hdg return. ERZC instructed CMWs wearing SCSR to grab spares.

Appendix 4 MG705 Timeline

Time	Location – MG705	**Action/activity**	**Key Decisions/comments**
02.55 am	B 33 east mains ERL	• CMWs continue escaping out A heading	• The group split into two smaller groups each led by a mines rescue trained person. This worked well and assisted the ERZC in managing the group. • Observed consistent monitoring of cylinder pressures and CMW status. • Those with SCSR in conducted great nonverbal comms.
03.15 am	A 22 east mains ERL	• Stopped at ct and entered into ct using airlock	• All CMWs refill (pretend) and went to make contact with control I advised ERZC all underground comms has been cut. ERZC advise all CMWs to refill and checked condition and advised to continue out A heading.
03.30	13 ct a-b east mains caba ERL	• Come through airlock into C/t	• All CMWs “refilled”, ERZC checked all persons and returned into A heading. Once again – Nil issues observed.
03.40	10ct a-b east mains	• Tried to enter Bhdg though air lock door but jammed as per VCD check sheet	• Explained to CMWs and erzc that door was jammed and that had been identified on VCD checksheet all CMWs proceeded outbye
03.57	3ct a-b east mains	• Entered into B Hdg into fresh air	• ERZC advised all CMWs to remove caba as they were in fresh air , he then made comms to the surface advising how many persons present and team condition
04.15	8 ct south east mains	• CRO advised 2 teams of six to remain ready to assist to fight fire.	• Only 2 CMWs out of the 30 there put their hands up to assist. The ERZC at this point was less than impressed and suggested those who did not want to help their fellow CMWs fight the fire should not be

Appendix 4 MG705 Timeline

Time	Location – MG705	**Action/activity**	**Key Decisions/comments**
			there in the first place.
		• CRO rang advising persons to start removing themselves from the mine	•
0427	8ct East Mains	• ERZC is notified by CRO that the firefighters require additional resources, specifically foam. • He goes with x2 Outbye personnel who have loaded up a drifty with equipment to deliver to the incident site.	• ERZC logic was to assess the scene and provide assistance where required.
0450	9ct East Mains	• Arrive at incident site with additional gear, asked whether reinforcements were required and was told no they had plenty though were tired as they had been fighting the fire for hours.	•
		• Returned to 8ct and arranged for all 705 to retreat to the surface – exercise over.	•

Appendix 5 LW704 Timeline

Time	**Location -LW704**	**Action/activity**	**Key Decisions/comments**
0116HRS	cribroom 25ct	• Phoned control. Control room informed ERZC of smoke coming down B Hdg in the East mains	• ERZC tried to call the MG which was unsuccessful • ERZC informed all persons in the cribroom of the smoke and the need to self escape, instructed CMWs to gather emergency equipment and prepare the driftrunners • At 0120HRS the ERZC stopped the AFC chain and informed face CMWs via the DAC of the incident instructing them to come to the cribroom immediately
0125HRS	cribroom 25ct	• Brief all crew in cribroom on the situation	• All CMWs back to the cribroom from the face at 0125HRS • Took the secondary escapeway plan off the rib (They took this out of the mine with them) • Explained of the intention to go inbye as there is a shaft which will put them in fresh air, stated to the crew that there was an ERL at 31ct, the crew would drive there and call control • Prior to leaving discussed plan of driving around the back via bleeder roads as they believed this air would no be contaminated by the smoke outbye
0130HRS	cribroom 25ct	• Left cribroom in driftrunner travelling to 31ct ERL	• No road tape was erected in 28-29ct, ERZC took this down and re-erected after driftrunners passed through • ERZC was in the lead driftrunner ensuring that environment conditions were safe to pass • Arrived at 31ct ERL at 0135HRS. Called control room informed of: • Number of CMWs • CRO informed ERZC to stay there in the fresh air and await instructions • Note: CMW asked for gas readings and made a record to assist in record keeping as a back up

0144HRS	31ct ERL LW704	• - Conversation with control room	• Updated control on the midface/intake roadway gas readings in accordance with Ventsim • Overheard the CRO talking to another person relaying the following information: • 11ct B Hdg injured man • 13ct damaged VCD • 11-12ct fire in B Hdg • D Hdg possibly clear • Broken leg in 12ct • Opening door in SEM to dilute smoke/contaminants
0148HRS	31ct ERL LW704	• - Conversation with control room	• Requested gas readings for the bleeder road • Informed control of intention to escape via bleeder road, told control of plan to ensure that each person escaping had 2 CABA each, taking additional CABA from the 31ct ERL • Control room operator passed the phone to UM whom instructed to egress via the primary escapeway (due to the risk of potentially getting bogged egressing via the bleeder road) • Due to the self escape equipment (only 5 CABA available ERZC chose persons whom would be required to talk during the egress to wear the CABA. Other CMWs would be donning SCSR
0157HRS	31ct ERL LW704	• - Travelling outbye from 31ct	• ERZC travelled in the second driftrunner • drift runners pulled up on the inbye side of 25ct in the fresh air • All CMWs donned their respective CABA and SCSR (note persons who donned SCSR had units around the wrong way and struggled to find their nose clips/as well as attempting to verbally communicate to other persons. Understandable in fresh air although this problem

			resurfaces • ERZC recorded CABA pressures • ERZC took the emergency phone from the emergency response pod in cribroom (was under CABA for this task)
0209HRS	25ct I/B fresh air LW704	• - Commencing egress via travel road	• Travelled out egress using primary escapeway in driftrunner • During egress persons in front of driftrunners using blindman sticks to detect the rib line whilst driving • Travelled in 2nd gear during egress
0213HRS	14ct ERL LW704	• Refill CABA • Contact control room	• Instructed persons on CABA to refill • Ran through the process of refilling • Contacted the control room. Informed of position/refilling CABA/number of persons (9)/exiting out B Hdg to the SEM
0221HRS	13ct LW OB LW704	• 1 CMW came out of the belt road unaware of the situation on hand	• ERZC was in the first driftrunner ahead • Assessor advised CMW of the scenario and asked CMW what they would do in the event that they saw smoke. CWM advised they would don their rescuer • Gave CMW a rescuer, CMW struggled with donning rescuer (unit was around the wrong way and could find nose clip for approximately 3 minutes, other CMWs did not assist, the buddy system requires reiterating to the workforce) • The oxygen canister activator on the SCSR did not activate, CMW activated using 4-6 breaths • Note: No service throughout the entire egress, PED

			service would have enabled the CMW at 13ct to take action eg: call control to arrange egress plan with LW crew
0229HRS	3ct ERL LW704	• Refill CABA • Contact control room	• Instructed persons on CABA to refill • Ran through the process of refilling • Contacted the control room. Informed of position/refilling CABA/number of persons (10)/exiting out B Hdg to the SEM
0240HRS	B Hdg 10ct DSEM	• Checked pressures • Environmental readings	• Lowest CABA pressure in crew 180bar • Environmental readings taken from ERZC, gave the readings from 17-18ct in DSEM in accordance with vent sim modelling • Note: ERZC CABA warning whistle alarmed at this time with the mask sucking straight to the face (potential blockage or fault) tried the suit again and it worked as normal
0253HRS	46ct D Hdg East mains	• Refill CABA • Contact control room	• Stopped to refill CABA • Tried to contact control via mobile (unsuccessfully) • Went into 46ct B-A Hdg to contact control, used lifeline and low beam to imitate low visibility, conversation: • Egress path which had been taken

			• 10 persons in group: 5 CABA and 5 SCSR • Requested update on the situation • - Once back to D Hdg the ERZC updated the crew on the situation
0304HRS	D Hdg 33ct East mains	• Egressing out of the mine	• ERZC requested environmental conditions • Explained that D Hdg outbye was full of smoke, E Hdg was inaccessible and that there was 20-30m visibility in 33ct underpass. The ERZC asked if A Hdg was passable and it was explained that there was 20-30m visibility there • ERZC elected to drive out in D Hdg, assessor said they would be blindfolded due to level of smoke, decision was made to egress via A Hdg • Assessor informed the ERZC that there was a cache/refill in 33ct were the crew could perform a SCSR changeover and a CABA refill • The ERZC updated his crew on the situation and intended travel path, through the underpass at 33ct, refill/changeover at the cache and egress out A Hdg to the fresh air side of the fire at 11-12ct B Hdg • 2 CMWs were quarantined from the exercise, instructed to take a driftrunner each to 8ct and wait • Note: The ERZC did not request the environmental conditions in D Hdg fresh air 52ct to 33ct due to downcast shaft

0310HRS	33ct D Hdg East mains	• Egressing out of the mine on foot	• Egressed via underpass to 33ct B-A Hdg cache • Refill conducted on CABA suits at refill station • Changeover completed on persons on SCSR, during the changeover the units were the wrong way around, 1 CMW did not hook his noseclip up on the unit which he changed over to for approx 3 minutes • There was an injured CMW hooked up to the refill station. The ERZC made the decision to leave the CMW there as opposed to trying to get them out of the mine due to the increased risk it would place on them with carrying a stretcher in poor visibility
0322HRS	33ct A Hdg East mains	• Egressing out of the mine on foot	• Entered A Hdg • Control was not contacted due to no phone at the refill station prior to entering A Hdg • The ERZC stayed in the middle of the pack during egressing out A Hdg with a designated persons checking on the welfare of the crew throughout the entire egress • Blind man sticks were used to tap and detect obstructions in the roadway
0336HRS	22ct A-B Hdg ERL East mains	• Refilling at ERL	• Entered the ERL, low beam was utilised to simulate smoke filled environment • Contacted control room at 0338HRS informed of: • Crew condition • Location • Update on the fire. Was informed of water issue and told that outbye of 11ct should be freshair • Note: The demarcation of 22ct ERL in A Hdg was poor, the sign was on the ground and the reflectors were hard to see in a good visibility environment
0342HRS	22ct A-B Hdg ERL	• Egressing out of the mine on foot	• - Commenced egressing via A Hdg again

	East mains		
0353HRS	13ct A-B Hdg ERL East mains	• Refilling at ERL	• ERZC informed assessors that crew would refill at this point, instructed it was noted and continued on
0356HRS	11ct A-B Hdg East mains	• Tried to access mandoor	• Instructed ERZC that the mandoor was inaccessible and that the only mandoor which was accessible was 3ct • Warning whistles alarmed at 0358HRS on 2 CABA units when walking between 9-10ct
0405HRS	3ct A-B Hdg East mains	• Accessing mandoor through to B Hdg	• When accessing mandoor, there was a lot of pressure on the door, opened the slider and could see brattice over the door. CMW cut away the brattice from the door and opened
0411HRS	3ct A-B Hdg East mains	• Call control	• ERZC contacted control room, was instructed to: • Go to 8ct where there are other crews, get a headcount with names of all persons in the area
0416HRS	8ct SEM	• Call control	• ERZC informed all persons at 8ct to count their crews and inform control of the head count. Each ERZC rang through their own crews that were assembled at 8ct
0430HRS	8ct SEM	• Call control	• ERZC called control and was instructed to assemble a team of 6 to potentially swap out the persons who were already engaged in fighting the fire

Appendix 6 CRO Timeline

Time *(24Hours)*	Location - CRO	**Action/activity**	**Key Decisions/comments**
00:57	Control Room	• CRO received a call from Coal Mine Worker (CMW) – CRO reported in log that CMW *(Robbie Fowler)* had damaged Overcast at 13 cut through (CT) B-C Heading (HDG) Mains. That he will bag it up.	• CRO advised CMW thanked him for reporting and bagging it up and told the CMW he would need to report it and tell the Vent Department in the morning. *(CROs did not identify this as part of the exercise)*
01:09	Control Room	• CRO received call from CMW – Heard CRO (sense of urgency from CRO noted) ask do you need an ambulance? CRO said to the other CRO someone is injured and coughing hard to hear the person. Asked CMW can you see smoke or anything around you?	• CRO 1 instructed CRO 2 to hit surface siren and get ambulance ready to dispatch underground. • CRO 2 activated surface siren and commenced reviewing gas monitoring for change. • Undermanager, Longwall Bunker CMW and 3 other CMWs arrived within minutes to the control room.
01:12	Control Room	• CRO received another call from UG – Heard CRO communicate to caller "Fire B HDG East Mains and no smoke up B HDG"	• Recorded notes and took next call from UG.
01:13	Control Room	• CRO received call from UG (Steve Drake) – Heard CRO communicate "Vehicle interaction B HDG East Mains two injured people.	• CRO dispatched ambulance from surface and requested mobilisation of Fire Pod from South East Mains (Andy Morris and Robbie on way to investigate and get fire pod)
01:14	Control Room	• CRO 2 to CRO 1	• Ambulance mobilised with first aiders.
01:16	Control Room	• CRO received call from Deputy that they had smoke in B HDG. Cro asked how many Loaders they have.	• CRO advised Deputy that Fire Pod is at 9 CT East Mains. • CRO communicated to Undermanager (in control room) if they go Inbye they will be

Appendix 6 CRO Timeline

Time *(24Hours)*	Location - CRO	**Action/activity**	**Key Decisions/comments**
			in fresh air.
01:18	Control Room	• CRO stated Deputy (Andy) in fresh air, getting loader to get fire pod, plan to establish FAB and fight fire.	• CRO communicated Fire Station at 9CT East Mains.
01:19	Control Room	• CRO 2 identified 50ppm CO at 18CT base of Fan Shaft.	• Communicated to CRO 1 & Undermanager 50ppm CO at fan shaft, and recorded gas alarms on handwritten report. • Undermanager recording key information with whiteboard maker pen on mine plan in control room. • (Question CRO about how gas alarms are recorded – Do they have an electronic log & CRO stated "NO on manual log". Asked if Alarms are set up to provide notification on CITECT to CRO when TARP triggers are activated and CRO replied "No we have hard copy TARPs in the control room that we follow)
01:20	Control Room	• CRO1 instructed CRO2 to call for external assistance – Fire, SSE, Mines Rescue, VO, Ambulance.	• CRO noted from briefing that "000" NOT to be called – Undermanager stated follow the TARP callout requirements.
01:23	Control Room	• CRO received call from UG (Andy) at 54CT and mobilising Fire Pod.	• CRO communicated to Undermanager.
01:25	Control Room	• Undermanager directed CRO to stop belts and get men in panels to make way out.	• CRO stopped belts with CITECT and commenced calling panels. • (Note: When later asked by Assessor about

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Time *(24Hours)*	Location - CRO	**Action/activity**	**Key Decisions/comments**
			the use of PED or tracking system - CROs & support person later stated PEDs don't work and they demonstrated delay alarm displayed since earlier in shift and that only the Longwall crews have Northern Lights and only limited nodes installed so not effective to be able to track CMS locations underground they don't have a system that does this.)
01:27	Control Room	• CRO received call from UG	• CRO communicated to Undermanager – Kevin Zone 3 stated no CO in belt road.
01:29	Control Room	• CRO updated Undermanager	• Surface Tag Board Secured and 5 x drift runners ready to go on surface.
01:32	Control Room	• CRO updated Undermanager	• CRO notified that All Panels on the move, still trying to contact Longwall crew.
01:32	Control Room	• CRO received call from UG	• CRO communicated to Undermanager massive fire in East Mains – Undermanager directed evacuate via vehicles as far as possible before going by foot. Need to contact VO.
01:33	Control Room	• CRO received call from UG – B HDG full of smoke, D HDG clear.	• CRO provided update to Undermanager.
01:36	Control Room	• Undermanager response strategy communicated to CRO.	• Undermanager communicated that the Fire is at 13CT B HDG East Mains and his strategy will be to open up double doors Inbye from TC104 opening mandoors B-C & C-D to send air down other roadways and needs CRO to get Deputy to do this.

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Time *(24Hours)*	Location - CRO	**Action/activity**	**Key Decisions/comments**
			Also consider restricting intake at 17CT – BUT needs VO approval before doing this restriction.
01:37	Control Room	• CRO requested additional support person to take calls.	• Longwall Bunker – CMW stated taking calls and maintaining CRO Log. • (This continued throughout the exercise CRO would write down notes and this resource would then handwrite these into CRO log – question if this is best use of resource which continued throughout the exercise and continued when day shift handover arrived)
01:38	Control Room	• CRO reported to Undermanager SSE on way to site and mobilising IMT, and that QMRS Tim Jackson has been contacted and activating Operations Manager should be on site in an hour.	•
01:39	Control Room	• CRO received update that 1 person has burns 10-11CT belt road.	• Sentry established to meet arrival of Ambulance (Qld Ambulance) at surface gate to escort to meet injured worker on arrival to surface.
01:39	Control Room	• CRO received a report from frustrated UG worker that assessors have blocked 13CT and what are they to do? • CRO asked assessor in control room what are they supposed to do?	• Assessor asked the CRO to review his log entry prior to incident and what was reported to them? CRO reviewed log, identified, and communicated to Undermanager that earlier in the night just

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Time *(24Hours)*	Location - CRO	**Action/activity**	**Key Decisions/comments**
			before 1am that Robbie Fowler had called them and notified that he had damaged the underpass no overcast at 13CT. Undermanager replied this is why smoke is going down the heading and into panels.
01:41	Control Room	• Undermanager request CRO arrange Deputy to open double doors TC104.	• CRO starts ring for deputy on phone.
01:44	Control Room	• CRO is notified Sentry in place at Drift.	• Sentry in place to prevent unauthorised person entering the mine.
01:44	Control Room	• Undermanager communicates CO all the way down mains and all East Mains polluted.	•
01:46	Control Room	• Deputy (Andy) reports to CRO from UG that Fire is at 11-12CT B HDG, has one person inured with fractured leg and one person with upper body burns at 11CT. Reports that double doors opened. Fire hose run out and fighting the fire. Fire Pod is at 10CT D HDG.	• Communicated to Undermanager who updated mine plan to reflect locations.
01:46	Control Room	• CRO received communication that Longwall crew total 10 men egressing via normal egress with CABA.	• Communicated to Undermanager.
01:53	Control Room	• CRO received notification that radiant heat pushing back firefighting efforts and foam being applied.	• Communicated to Undermanager.
01:54	Control Room	• CRO received Emergency Phone call that crew travelling up D HDG.	• Instructed to make way to support fire fighting at 11CT B HDG mains.

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Time *(24Hours)*	Location - CRO	**Action/activity**	**Key Decisions/comments**
01:56	Control Room	• CRO received call that there were 3 casualties, one of them burnt. Gus with 7 men under CABA, 1 man has sprained ankle in vehicle heading out SE Mains. Cro stated he can see pull keys being activated as crews exiting via belt road.	• Undermanager directed that they need to start tracking men and crews on the mine plan. • (Note - the mine has no effective real time system in place to track locations of CMWs underground).
01:59	Control Room	• CRO receives update that the burns casualty is going into shock, and other man has a fractured leg 11CT B-C HDG. Seven men are setting up foam now, fire is hard to control and Deputy requesting approval to use Turbex™ .	• Undermanager requests they check DMS for procedure requirements and is on phone with Ventilation Officer (VO) who is requesting more information before approving use of Turbex™ .
02:04	Control Room	• Undermanager ask CRO to establish if they have any Flinger Dusters to put down over B HDG Fire and that they must maintain ventilation over fire.	• CRO contacting and requesting Deputy at fire scene.
02:05	Control Room	• CRO receives update for Deputy at Fire that they are attempting to fight the fire and setting up foam generator.	• Undermanager vis CRO to Deputy directs that they must maintain ventilation over the fire to prevent smoke coming back over men, and that brattice can be used at discretion of the Deputy but must monitor the fire.
02:07	Control Room	• CRO receives notification that the South East Mains double doors in SE Mains opened and venting to return in B HDG.	• Undermanager directed don't chock off, adjust and monitor fire with vent change.
02:10	Control Room	• SSE arrived outside Control Room.	• Undermanager provides briefing of the emergency event to the SSE.
02:11	Control Room	• CRO receives update from underground that the ambulance is transporting men with broken	• CRO makes comment the phones are always cutting out. Redials location and

Appendix 6 CRO Timeline

Time *(24Hours)*	Location - CRO	**Action/activity**	**Key Decisions/comments**
		leg to surface & phone cuts out.	starts communication again.
02:13	Control Room	• CRO re-establishes communications and updated that both seriously injured workers on way out to the surface.	• Communicated to Undermanager.
02:14	Control Room	• CRO becomes frustrated with UG phones dropping out again as he was trying to answer incoming call.	•
02:15	Control Room	• CRO receives call room ERZC fighting the fire requesting use of Turbex™ .	• Undermanager requests direction from the SSE – who responds that he wants to establish if they have less ventilation. ERZC advises they had 52m3 and now have 40m3, not sure if brattice has been set up. Undermanager concerned if not established that Turbex™ could cut off ventilation.
02:20	Control Room	• CRO reports CO sensor have reached maxed out as sensors have reached maximum capability at 999ppmCO.	• Communicated to Undermanager. • {Note – Not sure why this did not trigger validation actions to be triggered – given at this time knew they were fighting a fire and did not appear that a risk approach was taken to ensure it is safe for crews to remain underground – could have triggered taking bag samples via tube bundle samples and run through Gas Chromatograph to validate what the atmosphere actually was to ensure safe to remain underground and monitor for

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Time *(24Hours)*	Location - CRO	**Action/activity**	**Key Decisions/comments**
			change – given 2 CROs and one has the responsibility to analysis bag samples so resource was available)
02:22	Control Room	• CRO receives update that Rob Fowler with fractured leg and Shane Myers with upper body burns and shock have left the East Mains on way to surface.	• Communicated to Undermanager.
02:24	Control Room	• CRO receives update from fire fighting location that it is the same ventilation with 40m3.	• Undermanager advises this is too much ventilation to use the Turbex™ and need to restrict ventilation before being able to use the Turbex™ and directs ERZC to put up brattice and restrict as low as possible without reversing the ventilation.
02:30	Control Room	• CRO is notifies 10 men at 3CT	• Undermanager notified.
02:32	Control Room	• Undermanager requests Deputy to open as many A HDG mandoors as soon as possible to 13CT heading Inbye to dump products of combustion into returns.	•
02:37	Control Room	• CRO receives update from Deputy that the brattice is up and ventilation restricted to 10m3 at 10-11CT.	• Undermanager directs Deputy they can now turn on Turbex™ .
02:39	Control Room	• CRO notified that the causalities are now on surface.	• Undermanager notified.
02:44	Control Room	• Undermanager departs control room to provide Brief to IMT.	•
02:44	Control Room	• UG Operations notify CRO that QMRS are now on site.	•

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Time *(24Hours)*	Location - CRO	**Action/activity**	**Key Decisions/comments**
02:50	Control Room	• CRO receives notification from underground that the fire hose is blocked.	• Crews now running out new hose.
02:51	Control Room	• CRO receives call from Drillers at 1CT 705, stating they saw drift runners heading out and what should they be doing as haven't been notified of any event.	• CRO stated he had instructed ERZC to collect everyone but must have missed the Drillers who were working Outbye. CRO instructed Drillers to make their way out. • (Note no real time tracking system in place and did not identify them as no accounted for when withdrawing crews, and at no time were calls placed over the DAC, PED or phone network to communicate emergency event instructions to CMWs, nor was a check list established early to track locations of CMWs)
02:53	Control Room	• CRO receives a call from underground that they have lost water pressure at fire and firefighting crew has retreated to 9CT East Mains.	• Communicated to Undermanager.
02:59	Control Room	• CRO receives call that the LW crew are at 46CT D HDG under CABA on way out.	• Communicated to Undermanager.
03:00	Control Room	• CRO receives call and communicated All Persons accounted for.	• Communicated to Undermanager.
03:00	Control Room	• CRO receives call that water pressure has been restored at 9CT and returning to fight the fire.	•

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Time *(24Hours)*	Location - CRO	**Action/activity**	**Key Decisions/comments**
		Also, that there is too much pressure on doors to get into A HDG.	
03:03	Control Room	• Undermanager directs CRO to get a Sentry in place at 7CT D Heading to prevent CMWs exiting the mine and have them redirected to support fighting the fire.	• CRO notified Deputy UG to establish undermanager's direction to "to get a Sentry in place at 7CT D Heading to prevent CMWs exiting the mine and have them redirected to support fighting the fire."
03:05	Control Room	• CRO receives update from 704 crew with 10 men at 33CT heading to 7CT D HDG – 5 men under CABA and 5 men under SCSRs, with CO off scale on portable gas detector.	• Undermanager notified,
03:12	Control Room	• CRO receives update that the pipe range has been isolated at 10CT as damaged outbye and now have water running to Turbex™ .	• Undermanager notified.
03:12	Control Room	• CRO notifies Undermanager that one of the LHDs at the fire had a fuel pod on it.	• Undermanager stated good to know.
03:16	Control Room	• CRO receives call that Gus' crew out at 3CT and going to assist fire crews at 9CT.	• Undermanager notified.
03:16	Control Room	• CRO receives notification from underground that the Turbex™ has failed.	• CRO arranges replacement to be sent down from the surface.
03:18	Control Room	• CRO receives update that 705 crew are at 3CT 705	• Communicated to Undermanager.
03:23	Control Room	• CRO receives call from an Outbye Electrician has been left behind at TC104 Jib called up to assist after walking up D to B HDG 13CT.	• Instructed that he is now out of the exercise. • (Note - Displays another outbye worker

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Time *(24Hours)*	Location - CRO	**Action/activity**	**Key Decisions/comments**
			not receiving communication or being tracked)
03:24	Control Room	• CRO provides an update that all crews accounted for and going to fight the fire, and two Supply man on surface.	• Undermanager notified.
03:27	Control Room	• Sentry at Portal requests approval for LHD with Foam to go underground.	• Undermanager approved LHD with foam – now proceeding UG.
03:27	Control Room	• Undermanager notifies he is going to brief IMT.	•
03:25	Control Room	• CRO receives call that LHD has broken down at 54CT.	•
03:30	Control Room	• CRO receives notification Ambo on way out to surface with injured worker who has sprained ankle.	•
03:37	Control Room	• CRO receives notification that Strata has started to fail Inbye 11CT an old overcast site. Need Props, wedges, bowsaws and LHDs to take emergency pod into section	• CRO sent runner to notify IMT and arrange strata support equipment to be prepared and transport from surface.
03:37	Control Room	• CRO receives request from Surface Sentry to allow ISHR Stephen Watts access to site.	• Access approved and communicated to Undermanager.
03:42	Control Room	• CRO receives request from Deputy at Fire for additional low and high expansion foam and strata support supplies.	• CRO arranging supplies and requests approval from the IMT to allow LHDs to transport supplies to crews fighting the fire.
03:46	Control Room	• CRO receives update that expansion foam is past South East Mains to 9CT.	•
03:48	Control Room	• CRO notified that injured worker Stewart Butler now on surface.	•

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Time *(24Hours)*	Location - CRO	**Action/activity**	**Key Decisions/comments**
03:39	Control Room	• CRO notified that crews on foot heading out of A HDG and 5 x drift runners instructed to go to Staging Area at FAB.	• Communicated to Undermanager.
03:53	Control Room	• CRO receives IMT approval for LHDs with timber to go underground.	• Undermanager request CRO to ensure drinking water goes down with supplies. CRO notifies Supply man.
03:55	Control Room	• CRO receives call that 4 drift runners are at 8CT and men exiting via A HDG.	• Undermanager question CRO on locations of people as previously reported to IMT that All Crew accounted for and fighting the fire. • This generated a confused discussion trying to work out locations for CMWs underground; went from 10 to 25 to 30; Gus' crew, LW crew missing, 3 Drillers, 704 10 men accounted for, 705 16 men & 3 Drillers in A HDG return at 03:40 at 22CT.
04:04	Control Room	• CRO provided Portal Sentry with approval for drift runner to go underground with foam.	• Foam supplies Inbye.
04:10	Control Room	• CRO contacts Deputy and requests head count of who is present at 8CT South East Mains. Also advised 704 travelling in vehicles looking for 705 crew and 3 Drillers.	•
04:14	Control Room	• CRO advises Props and water Inbye from the surface.	•
04:19	Control Room	• CRO receives update that everyone is accounted for, but that 1 CMW has been left attached to ERL (Emergency Rescue Location) at 35CT A-B East Mains due to suffering	• Undermanager notified.

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Time *(24Hours)*	Location - CRO	**Action/activity**	**Key Decisions/comments**
		stomach cramps and unable to walk out,	
04:26	Control Room	• Undermanager advised that the strata fail at 11CT is an old belt chamber site and not as previously reported an overcast.	•
04:28	Control Room	• CRO notified that two crews are rotating out and continue firefighting.	• Undermanager notified.
04:30	Control Room	• Day Shit crews arriving on site and Undermanager directed they get dressed and wait in Training Room to get a briefing and direction.	• CRO notified Sentries to communicate requirements to oncoming day shift CMWs
04:43	Control Room	• CRO receives update from Deputy that he can't see the roof due to foam, needs timber and requested supplies.	•
04:46	Control Room	• Update from Exercise Controller (GN) to Control Room & Undermanager – advised that any drift runners outbye can be used to transport people, however any drift runners in Inbye side of firefighting cannot be used until 06:00am.	• CRO and Undermanager notified of rules of exercise.
04:48	Control Room	• CRO Handover (Nights to Day Shift) – NS CRO communicated: • There had been a vehicle interaction at 11CT B HDG resulting in a fire at approximately 01:10am. • Andy Morris in control at scene, with Fire Fighting ongoing with crews rotating as required. • All crews accounted for now.	• (Note adhoc verbal handover – no prepared and approved Handover briefing communication from IMT, Undermanager or CROs to oncoming day shift CROs)

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Time *(24Hours)*	Location - CRO	**Action/activity**	**Key Decisions/comments**
		• Turbex™ had broken and replaced. • Fuel Pod involved in fire. • One guy left at 35CT hooked up to ERL. • Roof deformed due to heat from fire, can't see roof due to foam, props currently heading Inbye from surface. • 2 crews rotating on firefighting. • Ambo brought out injured – 1 badly burnt and 1 fractured leg. • Damaged underpass at 14ct allowed fouled air to pollute Inbye. • Still in first response phase – plans being formulated by IMT. • GC Fire Span Gas leaking and replacement cylinder being sourced suspect leaking at regulator. • What's left – Rob, Fire, Roof and 14CT underpass. • Steve Drake 13Ct Sentry • Can send drift runners down to collect men. • 2 x Teams on firefighting rotation and 6 on standby. • Dave Stone in charge of IMT.	
05:00	Control Room	• IMT request CRO update.	• CRO provided update that at 04:40 Deputy could not see roof due to foam; timber had not yet arrived, and Sentry had been established at 8CT.
05:04	Control Room	• Permission provided to exclude Sealing Crew from the exercise and allow access to work.	• CRO & Undermanager notified & Sealing crew permitted to work as per mine

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Time *(24Hours)*	Location - CRO	**Action/activity**	**Key Decisions/comments**
			planning.
05:11	Control Room	• QMRS rang from Mines Rescue Hut requesting an update on East Mains 11CT Overcast.	• Request communicated to Undermanager
05:20	Control Room	• CRO sends DS Deputies sent to collect NS employees not involved in fighting the fire.	•
05:20	Control Room	• CRO receives update from Deputy at the fire scene that 3 x Props are up, Foam is over the fire and starting to control it.	• Undermanager notified and asked the following questions of the Deputy: • Local FAB status? Secure • What is status of foam supplies? 8 x Drums left • Did drift runners with foam arrive? Only 8 drums left. • Undermanager notified Deputy that drift runners have been sent Inbye to collect non-essential NS employees. Undermanager providing update to IMT.
05:33	Control Room	• CRO receives update that the Turbex™ foam is on the fire, it's under control but not yet out.	• Undermanager notified.
05:39	Control Room	• IMT confirmed 13CT Underpass and pollutants going Inbye.	• (Was some confusion over 11CT Overpass incorrect information earlier)
05:42	Control Room	• SIMTARS contact CRO and offer support, will commence running GC checks and establish Fire Span setup.	• Undermanager notified.
05:45	Control Room	• Bag Samples from 18CT Shaft arrive at Control Room	• Setting up to run bag samples.
05:47	Control Room	• CRO receives notification that LHD has broken down and blocking 45CT B Heading.	• Undermanager notified.

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Time *(24Hours)*	Location - CRO	**Action/activity**	**Key Decisions/comments**
05:48	Control Room	• CRO notified that Aquila Mines Rescue bus has arrived at Gate.	• CRO sent them to Mines Rescue Hut.
05:52	Control Room	• IMT request CRO get an update from Deputy check the condition of 13CT underpass and foam usage rate.	• CRO attempting to ring underground to contact Deputy to action request.
05:55	Control Room	• Oaky Creek Mines Rescue minibus and Ute with gear arrive at entrance.	• CRO sent to Mines Rescue Hut
05:58	Control Room	• CRO contacts ERZC and requests condition of D 13CT East Mains Underpass roadway integrity and foam usage rate.	• ERZC to inspect and come back to CRO.
06:00	Control Room	• As previously communicated – Firefighting response to be maintained, but all Inbye drift runners now released to transport NS CMWs to surface.	•
06:06	Control Room	• CRO attempted to contact Rob at 35CT ERL via phone.	• No response – Undermanager and IMT notified.
06:08	Control Room	• Undermanager notifies CRO that he has dispatched 2 x drift runners and 2 x Crews from DS to takeover firefighting.	•
06:10	Control Room	• CRO attempts to ring Rob at 35CT ERL.	• No response.
06:11	Control Room	• CRO notified 2 x QMRS members at gate.	• CRO sent them to the Mines Rescue Hut.
06:12	Control Room	• CRO receives update from Stores that 11 drums of foam sent to fire and will have supply of 10,000ltrs of foam on site by 06:20)	• Undermanager notified.
06:18	Control Room	• CRO notified Livo from QMRS at gate.	• CRO sent to Mines Rescue Hut.

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Time *(24Hours)*	Location - CRO	**Action/activity**	**Key Decisions/comments**
06:26	Control Room	• CRO receives Deputy update that the foam is now waist high at 35CT, Cant shut doors at C HDG underpass, 12-13CT D 38.5m3 and temp 22dry/24wet,13CT C HDG 35m3, temp 22dry/26wet and zero CO & CH4.	• Undermanager notified.
06:30	Control Room	• CRO receives Deputy update that Foam is waist high 35CT outbye centre line to B13. Fire is OUT and on fire watch. Ben Tan is now in charge at scene. Rechecking Tag boards, roadway D HDG no contaminants and streams up.	• Undermanager notified.
06:34	Control Room	• Bag samples arrives at surface GC	• Bag sampling being analysed.
06:35	Control Room	• CRO notified Mick Jones from QMRS arrived at gate.	• CRO sent to Mines Rescue Hut.
06:35	Control Room	• Assessor Observation	• Handover NS to DS – new CRO support again handwriting notes from CROs onto the CRO log – Question if this is best use of a resource.
06:44	Control Room	• Undermanager to IMT – Fire is out, and fire watch established. Still have irrespirable atmosphere and a man at 35CT ERL. Maybe able to ramp up QMRS recovery of man at 35CT, as Oxygen increasing around the pit.	•
06:48	Control Room	• CRO received update from underground Deputy that 10 men had arrived to fight the fire, that the fire is out & phone dropped out.	• CRO dialled back to re-establish contact.
06:49	Control Room	• CRO reconnected with UG – who stated fire watch in place. Undermanager asked about 13CT integrity and response was nothing	• Undermanager (DS) informed UG to start going Inbye D HDG to checking air to establish if safe to do so to recover person

Appendix 6 CRO Timeline

Time *(24Hours)*	Location - CRO	**Action/activity**	**Key Decisions/comments**
		damaged. Undermanager directed need to re-dust heading from 35CT. UG stated water and air services intact.	at 35CT or report on environment found. If safe to do so will allow recovery of Rob Haberman (spelling). Deputy replied has 6 people – 2 Deputies & 4 operators in two drift runners on way @ 7CT will update when they get there.
07:08	Control Room	• Undermanager stated requested action from IMT to call crews back to FAB and not recover man at 35CT.	• CRO commenced call Deputy to communicate IMT requirement.
07:30	Control Room	• CRO received update from Deputy that Fire watch in place, lots of contaminants and heat present.	• Undermanager notified.
07:38	Control Room	• Person handed printed IMT Meeting Minutes to CRO.	• (Note no verbal update, objects or CRO actions provided to CRO. This is the first time the CROs received any documented IMT meeting minutes and at no time throughout the exercise were regular updates provided to CRO on formal engagement or electronic or hard copy actions provided to them – had been verbal between CRO and Undermanager)
07:45	Control Room	• NS Assessor (CG) depart site – Level 1 Emergency Exercise continuing.	•

Appendix 7 Undermanager Timeline

Time	Location - Undermanager	Action/activity	Key Decisions/comments
0110hrs	Surface Control Room	• Emergency alarm sounded and activated as per site procedure. A fire was reported to CRO from an event of machine interaction in EM's causing a fire and thick smoke.	• CRO informed UM L.Vella who arrived to control, room promptly.
0112hrs	Surface Control Room	• UM requested CRO notify production crews and OB personnel to egress to OB side of incident site.	• UM requested that CRO's ensure they have relevant support or scribes to assist in documenting incident and recovery.
0114hrs	Surface Control Room	• UM formed first response on the surface using shifties to gather personnel.	• Clear direction of request was communicated to all relevant personnel. Giving regards to risk m/ment.
0116hrs	Surface Control Room	• UM briefed CMWs initiated to first response to incident	• Clear comm's used for factual situation and current conditions. UM briefed CMWs of incident communicated from u/g and first response requirements from not only u/g personnel but from surface personnel requested to support u/g with resources. UM also requested that tagboard attendant be established and surface muster be demarcated to shepherd arrivals in.
0116hrs	Surface Control Room	• UM reviewed Real Time sensors with CRO's to determine additional actions and advice to u/g personnel egressing the mine.	• Clear comm's observed during this process.
0125hrs	Surface Control Room	• UM received comm's from U/G, from ERZC. Request was made to determine environmental conditions in EM's Dhdg for the purpose of environmental exposure and egress purposes.	• Cllear comm's and expectations requested. Regards given for risk m/ment and personnel exposure by UM. Requested information be forwarded back to CRO asap.
0132hrs	Surface Control Room	• UM requested ERZC open double doors in EM's to lesson the velocity over known	• Good understanding of mine ventilation design and discussion had with safety and

Appendix 7 Undermanager Timeline

Time	Location - Undermanager	Action/activity	Key Decisions/comments
		machine fire.	health with regards to smoke exposure. Changes documented to Liase with VO when onsite, as this was considered a minor change to district ventilation standards.
0138hrs	Surface Control Room	• UM requested notification be made with regards to incident and request for IMT on site.	• Mech shifty actioned to this process. Clear comm's confirmed that UMM/SSE notified and were heading to site. (D.Stone)
0140hrs	Surface Control Room	• Shifties confirmed that VO notified and on way to site. UM requested Portal sentry be established and	• CMW chosen and briefed and deployed to portal as sentry. • Excellent support from shifties. • Also Ambulance contact and escort organised at front gate.
0148hrs	Surface Control Room	• UM using mine plan to determine risk for emergency escape for LW crew to stay in known fresh air from shaft.	• UM gave direction for LW crew to egress via primary egress using MPT and to stay in clear comm's with status from the surface.
0200hrs	Surface Control Room	• UM requested permission from VO to use turbex foam to attack fire for fire fighting. Call made to VO to confirm.	• Clear discussion made between UM and VO on risk m/ment course of action.
0202hrs	Surface Control Room	• UM spoke to ERZC Andy Morris who had taken charge of fire fighting activities u/g on LHD	• Clear comm's observed and confirmation sourced on directions given.
0210hrs	Surface Control Room	• SSE/UMM onsite • UM briefed manager on status of incident and CMWs and u/g environment	• Clear comm's observed. • D.Stone asked questions and UM gave clear answers. A clear understanding of corrective actions confirmed and D.Stone advised that IMT will be setup and requested UM brief IMT as soon as practicable.
0215hrs	Surface Control Room	• SSE/UMM liaised with UM on turbex requirements and vent conditions, also discussed status of Real time gas monitoring.	• The discussion was more for confirmation to ensure the decisions were being managed in regards to risk.

Appendix 7 Undermanager Timeline

Time	Location - Undermanager	Action/activity	Key Decisions/comments
0230hrs	Surface Control Room	• UM communicated to shifties for assistance to ensure for accounting for men and double checking tag board attended.	• Used onsite damstra for checks and balances to audited tagboard and checked against personnel onsite.
0235hrs	Surface Control Room	• UM had direct communication with OB ERZC for VCD control in fire fighting at EM's Bhdg	• UM gave clear direction of placement of temporary VCD for the purpose of turbex suppression of fire. This direction was repeated back to UG ERZC and confirmation obtained. • NOTE: U/M working on vent requirements in EM's getting control of fire. VO sourced for assistance with redirecting or restricting air to incident site.This vent change process needed to be followed.
0240hrs	Surface Control Room	• Turbex™ was confirmed online and reporting to fire to UM from u/g and approx. 10m3/s air quantity reporting to area	• Clear comm's between CRO and UM from u/g. • When information become available it was processed by UM and direction given to u/g
0245hrs	IMT Training Room Surface	• UM attended first IMT session and briefed IMT on current status of personnel egressing and mine environment	• Clear comm's communicated by UM of incident status with information provided from u/g. Corrective actions implemented. SSE/UMM was very supportive of decisions. Actions developed from IMT and UM given clear direction. IMT next meeting schedule was clearly understood.
0307hrs	Surface Muster	• UM received information from U/G that turbex was U/S and needed support for providing assistance with more resources	• UM gave direction to shifties to source resources and gave clear direction of where it was needed and requested confirmation of status.

Appendix 7 Undermanager Timeline

Time	Location - Undermanager	Action/activity	Key Decisions/comments
0315hrs	Surface Control	• UM requesting information from u/g from CMW as for location and current status in regards to gas monitoring	• CRO and shifties assisting with supporting UM with providing information
0330hrs	IMT Training Room Surface	• UM briefed IMT on current status of incident and u/g personnel.	• UM provided clear concise information to IMT. All information processed and actions raised by incident controller for fire fighting. Next meeting scheduled prior to leaving IMT meeting room.
0355hrs	Surface Control Room	• UM continuing to determine current status of u/g personnel for the egress status and locations. Comm's made with surface resources to deploy timber props for strata control due to roof deterioration	• UM requesting current information on status of strata and fire fighting capabilities.
0420hrs	Surface Control Room	• 1 x OB operator deployed via tag board allocation to EM's Bhdg 10-11hdg. For strata control.	• Water sent in for CMWs also. • Discussion had with regards to strata support advice and get Geotech involved to provide technical advice.
0440hrs	Surface Control Room	• UM L.Vella briefed oncoming DS UM Josh Smith	• Clear comm's of incident and current status of emergency. Josh Smith took notes and asked relevant questions associated with status and first response.
0450hrs	IMT Training Room Surface	• IMT meeting as per schedule. L.Vella UM and J.Smith DS UM attended. L.Vella briefed IMT on current status and actions taken from previous scheduled IMT.	• UM provided relevant information to IMT in regards to incident status and CMW status. Actions developed by IMT and L.Vella took his actions away from IMT meeting to continue with emergency control. Next scheduled meeting advised.
0520hrs	Surface Muster	• Actions implemented to utilize oncoming DS. Actions implemented to utilize oncoming DS	• Comm's made of status of incident and CMWs being brought out of mine. Six props

Appendix 7 Undermanager Timeline

Time	Location - Undermanager	Action/activity	Key Decisions/comments
		ERZC's were to deploy MPT's x 4 to transport personnel from place of safety U/G to the surface. • L.Vella obtained direct comm's with Andy Morris ERZC at fire fighting area. L.Vella setup sentry OB to redirect personnel on OB side of fire to head back Inbye to provide assistance. CRO's were handover between shifts	communicated installed under lip of strata deteriorated area. Area is stable. Fire coming under control, but still needs labour to continue to manage fire. Labour was on the scene.
0540hrs	Surface Control Room	• UM's under direction of IMT, sourced status of fire and deployed oncoming DS labour.	• Confirmed labour to be deployed and labour being deployed u/g
0555hrs	Surface Control Room	• CRO under direction of UM sourcing information on status of 13c/t C-Dhdg under pass.	• Confirmation made with u/g OB ERZC to have 13c/t C-Dhdg under pass assessed and communicate results back to CRO.
0602hrs	Surface Muster	• NS UM briefed DS labour work group formed to be deployed u/g to continue assisting to fight fire in EM's B10-11c/t	• CMWs clearly understood objective communicated by UM and asked relevant questions in regards to who is incident controller under ground and who they report to.
0615hrs	IMT Training Room Surface	• UM briefed IMT. • Actions established to recover cmw at 35c/t, discussion had to prepare QMRS support which were preparing onsite and numbers identified. • Fire fighting confirmed as under control at EM's B10-11c/t	• Actions established and implemented. Next meeting scheduled 0745hrs. • UM's (NS and DS) took actions from IMT and deployed personel.
0650hrs	Surface Control Room	• UM received comm's from u/g, men continuing with fire fighting, fire is still coming under control.	• 13c/t u/pass integrity communicated as stsble and secure, minor damage from u/g. UM NS completed handover with DS UM.

Appendix 7 Undermanager Timeline

Time	Location - Undermanager	Action/activity	Key Decisions/comments
			Now DS UM J.Smith is under control of activities directed by IMT. DS UM confirms fire is out from U/G comm's A.Morris. Requested ERZC's OB travel inbye Dhdg to determine status of environment to recover 35c/t cmw. It was communicated that 35c/t cmw left u/g will need recovery and QMRS will need to be ready to be deployed.
0700hrs	IMT Training Room Surface	• IMT meeting. DS UM J.Smith briefed IMT on actions taken from previous meeting and current status of mine.	• IMT processed status and actions discussed
0730hrs	Assessor duties	• Requested to leave site by E.Gosk due to travelling back to Emerald and fatigue m/ment	• Observed one on one briefing of personnel and their involvement with u/g emergency escape and assistance. • I took NS UM L.Vella and his shifties into the UM office and had a discussion about the incident emergency process Prior to me leaving site • I left site at 0815hrs after shower. The turn stile had a sentry ensuring personnel sign out which was a good process.

Appendix 8 IMT Timeline

Time	Location - IMT	Action/activity	Key Decisions/comments
135	Surface tag board	• Tag board attendant allocated and board no roaded for UG acces	•
154	Surface muster area	• Siren sounded, no explanation	•
210	Surface tag board	• List of all personnel scanned in taken from control and cross referenced against tag board	•
210	Control Room	• David Stone (DS) arrives / Luke Vella (UM) provides update in control room.	• Ventilation change conducted by UM, FAB established at B Hdg East Mains Outbye of Fire. • Withdrawal from the mine has commenced, is everyone accounted for? UM could not confirm.
212	Control Room	• Update in CRO, Confirmation of the vent change to restrict Q to fire.	• DS – 'have we confirmed vent reduction' • CRO -40m3/s, now • DS – 'what did we have before?' • UM – "ill check the start reports" • CRO – 52m3/s which has gone down to less then 40 , • DS- where is the turbex up to?
213	Control Room	•	•
221	IMT Room	• IMT Formed	• DStone received situation update. Took control as Incident controller, issued vests and positions. • M. Lions (Doctor) on the way to site as are all other personnel required for the IMT • Duty Cards issued, boards updated with all responsible persons and interim persons.

Appendix 8 IMT Timeline

Time	Location - IMT	Action/activity	Key Decisions/comments
			- 3 x injured – broken leg and burns • Atomosphere – 1000PPM CO at DSEM, restriced ventilation • UG requested turbex use, UM uncomfortable to authorise without VO and SSE/UMM approval.
226	IMT Room	• External Notifications	• Glencore Corporate – 159 • S. Watts – 152 • L. Crisp – 149 • QMRS contacted by UM and in transit.
230	IMT Room	• Doctor Arrived on site	• Sent to first aid room in preparations for patients.
231	IMT Room	• IMT Meeting	• Planning allocated – John – Action – Confirm turbex authorisation requirements? • Objective Set – Preservation on life and evacuation from the mine. • Deputy IC Allocated – Oliver • Next IMT Meeting Set 240, • Setup the IMT room and find the scribe, Michelle allocated temporarily
234	IMT Room	• IMT Room setup	• IC duty card reviewed by DS, file system setup for IMT,
240	IMT Room	• Update from UM	• 1 person on the surface with the doctor. • Safety officer allocated, tabard missing, given task of risk assessing our actions. • DS – get luke to come in and give us an update.

Appendix 8 IMT Timeline

Time	Location - IMT	Action/activity	Key Decisions/comments
			• Cameras not showing smoke in workings, *EG assessor confirmed cameras inbye of the fire are showing zero visibility.*
246	IMT Room	• Update from UM	• 3 crews have reached D Hdg EM, all personnel in crews accounted for. • Brattice erected on outbye side to restrict ventilation to fire, Turbex™ stared 240. • Deputy has opened man door to dump pollutants to return. • 1 x fireteam fighting fire with 3 deputies. • Portal control and board in place.
250	IMT Room	• QMRS Turned up, asked to be on standby not attend site.	• Asked to stay out of IMT until end of meeting.
250	IMT Room	• IMT Meeting Primary Objective – unchanged	• Assemble firefighting teams at OB side of fire • Determine FAB location (already setup by NS UM) • Establish rally protocals for firefighting and sentry, • 10ct SEM blocked, why? No one can confirm, find out. • Establish foam stocks from all neighbouring mines (Grasstree, Aquila, Kestrel) • Establish DS teams to entry the mine and handover firefighting with N/S • Next Meeting 330 • Setup filing system and action register.

Appendix 8 IMT Timeline

Time	Location - IMT	Action/activity	Key Decisions/comments
300	IMT Room	• Incident Controller external updates	• Laurie Crisp not planning to come to site. Steve Watts on his way.
307	IMT Room	• Printing of actions established, Oli (Deputy IC) dropping off after each meeting.	• Tidied up battle boards
311	IMT Room	• Review of ventilation arrangements/ plan – IC	• D. Stone identified downcast shaft in LW, fresh air and potential LW response to go to the back of the longwalls. • Contacted Glenn South(Surface Manager) Mobilise ERT and secure site.
319	IMT Room	• Status Update	• HD operator Broken Leg, • S. miners – Burns requiring first aid treatment. • Still no ambulance on site, notified of a real event at Capella.
333	IMT Room	• IMT Meeting – Status update	• Accident with 2 LHDs on EM travel road, • All individuals accounted for and outbye of incdent site. FAB. • Turbex™ failed in service (Not part of scenario) • Pipes blew causing loss of water pressure, repaired. • Action : Establish locations of all vehicles, FAB location and fire fighting equipment, • Identified foam will run out, • Action : require fire fighting contingecy plan, ventilation restriction, back wall for fire. • Action: inertisation capability, boiler etc. • Action: Confirm ventilation elshewhere in

Appendix 8 IMT Timeline

Time	Location - IMT	Action/activity	Key Decisions/comments
			the mine has not changed. • Action: Confirm status of goaf wells,
		• Update mid IMT Meeting	• Update: Both injured persons on the surface, in ambulance and on the way to the hospital. • 11c/t B Hdg – Strata failure, mobilising timber, next meeting 450
400	IMT Room	• IC	• What are the potential scenarios for a roof fall at this location? • Update: Mining personnel 705MG x 16,are the ops team aware of this? Contradicts previous update.
420	IMT Room	• External notifications	• Larie RSHQ notified, LHD x 2 collision with fuel pod involved. 2 injured persons on the way to hospital, 1 x sprained ankle, roof working, 19 persons unaccounted for.
428	IMT Room	• Scene controller handover	• Josh Smith to shadow Luke Vella for last meeting and handover as scene controller.
431	IMT IC	• D/S arriving	• Prepare statement for crew notification. • Media holding statement confirmed and distributed. • Safegas scenario not operating correctly, issues of switching stages. • Steve Watts, updated on status
	IMT IC	• IC reviewed duty card	•
	IMT Room	• Status Update	• Luke Vella • Strata support materials in transit to

Appendix 8 IMT Timeline

Time	Location - IMT	Action/activity	Key Decisions/comments
			incident site, • 1 x CMW at 35c/t ERL B-C with stomach pains and cant walk. IC “what, where did this come from?” • Damaged O/C 14c/t EM, discounted by planning due to the ventilation model and the safegas scenario. • Action: Ops create roster for firefighting and QMRS Mobilising. • All persons accounted for,confusion was due to persons walking through returns, Nil info around strata, • Action: mobilise QMRS to build back wall in O2 deficient atmosphere. • Action: What hydrocarbons are showing inbye? Tube bundle monitoring? • Action: - Risk management for the UG process and deployment of QMRS. • Mission: Recover miner, instructed no person to carry anyone else out under CABA. • Next Meeting 615
524	IMT Room	• SSHR Update	• Details provided, SSHR to be allocated to planning team on arrival.
530-538	Training Room	• D/S crew update	• Nil issues
545	IMT Room	• Update	• CHPP requesting approval to swap out crews. Approved.

Appendix 8 IMT Timeline

Time	Location - IMT	Action/activity	Key Decisions/comments
			• 13c/t O/C damaged, previously incorrect information provided. (underpass/ overcast confusions, still not sure) • Fire undercontrol, 3 props set under lip of strata deterioration • Action: determine plan for QMRS
610	IMT Room	• IC	• RSHQ in transit to site,
	IMT	• IC	• Personnel to be debriefed individually, once complete, free to be released off site. Note: correct process would be debriefing, media statement and information regarding incident.
620	IMT Room	• Update	• FAB at 10c/t A-B • QMRS on site, x 16 • UG person not responsive to phone, calculated 11 days of air at CABA station. • Next Meeting 745
647	IMT Room	• Update	• Fire is out, fire watch established.
652	IMT Roon	• RSHQ arrived	• Laurie Crisp on site, arranging access.
656	IMT Room	• Injured Persons Update	• R. Fowler – Emeral hospital being treated, • S. Miners Flying doctors to BNE fire unit.
744	IMT Room	• Ops Team • Planning	• Commence investigation into the incident. • Planning communicated with QMRS to respond. Info to mines rescue provided • FAB at 10c/t • Advance uncoupled and build back wall to

Appendix 8 IMT Timeline

Time	Location - IMT	Action/activity	Key Decisions/comments
			drop products of combustion travelling inbye. • Action: VOto model contaminants, • QMRS Deployment Goal discussed, insufficient risk management process and understanding of requirements by fill in QMRS Operations Manager (Clint) Neither SSE/ IC Dave Stone or RSHQ Laurie Crisp comfortable with approach to deploy in real scenario. • Next meeting 845 • SCENRARIO ENDED

Appendix 9 Planning Timeline 1

Time	Location -Planning	**Action/activity**	**Key Decisions/comments**
2:25	Planning	• Tech Services Manager (Planning Coordinator) arrives onsite	•
2:30	IMT	• 3 injured in vehicle • Firefighting currently underway at 13 c/t E Mains • Turbex™ deployed • Restricted ventilation • Crews evacuating	• Objectives determined • Preserve life • Control fire • Evacuate
2:35	Planning	• Tech Services Superintendent arrives	• PC has called 4 people in for his team at this point
2:45	IMT	• First official IMT meeting • Luke Vella- 3 crews evacuating D Hdge E Mains • Vehicle fire 11 c/t B Hdg • Combustion to 18 return & deep SE Mains • Deputy Andy Morris Opened double doors at TC04 to increase air in C&D Hdg and minimise air B Hdg Fire • Brattice set up • 10 m3 over fire • Turbex™ just started • 3 injured- 2 heading out, 1 upstairs	• Notified sentries and ambulance • Portal control and site security set up
2:50	IMT	• QMRS representative already arrived	• QMRS put on standby
2:50	IMT	•	• Primary objectives- Remove people • Secondary- fight fire
2:50	IMT to PC	• Action to determine FAB location and additional firefighting resources needed	•

Appendix 9 Planning Timeline 1

Time	Location -Planning	**Action/activity**	**Key Decisions/comments**
		• Establish by 10 c/t FAB blocked • Assess stock of foam regionally from Aquilla, Grasstree, Mines Rescue • Action to create firefighting and vent plan	
3:01	Planning	• Actually 11 c/t not 13 c/t B Hdg E Mains fire site • Smoke in LW & Trunk system • Evacuation via D TC04 blocked via assessors • FAB being setup- location unknown • All CO readings 50ppm which is off scale	• Try to reduce air over fire, Andy opening doors to dump to return • VO questioned how many doors open, location of brattice
3:15	Planning	• Report that no doors open as it won't do anything	• General body points put on hold for tube bundle
3:30	IMT	• All individuals accounted for • Action to establish vehicles there • Stock of firefighting supplies at FAB and what is on the way down	• Need firefighting plan established
3:38	IMT	•	• Decision to mobilise QMRS and put inertisation on standby
3:40	IMT	• Confirm 2 injuries not 3	•
3:40	IMT	• Don't know why underpass is blocked • Vent brattice on intake side • 11 c/t B Hdge strata failed	• Objectives • Preserve life • Safely fight fire • Secure roof safer • Removed objectives of • Remove injured parties

Appendix 9 Planning Timeline 1

Time	Location -Planning	**Action/activity**	**Key Decisions/comments**
			• Evacuate outbye fire
3:53	Planning	• Planning meeting • All persons outbye • Incident was 2 loaders collided, one with diesel pod • Plan A- what we are doing currently to fight the fire • Plan B- mines rescue	• Backwall and high expansion foam are Mines rescue tasks as the mines can't do it themselves
4:00	Planning	• Hit overcast with loader at 13 c/t east mains • What do we need to do to deploy mines rescue • What if mines rescue can't be deployed	•
4:10	Planning	• Need to teach someone to run bag samples • Send someone to tube bundle hut to run them and another person to run to the CRO	•
4:15	Planning	• ISHR Steve Watts arrives in planning and requests briefing	•
4:20	Planning	• ISHR briefing by Michael Angel- has been onsite since 3:30 • Info conveyed: • Offscale CO at 1000 ppm • Rob Fowler was one of the loader drivers • All injured parties upstairs • 2 with burns, 1 LD with broken leg	• Time and location of event not available in planning at this time, nor are names of other injured, witness and details of event • *much of this was available in IMT and didn't make it to Planning team members
4:30	Planning	•	• Location confusion was being blamed on assessors by PC

Appendix 9 Planning Timeline 1

Time	Location -Planning	**Action/activity**	**Key Decisions/comments**
			• PC recommended to team to start with notebook and move to a more formal process for recording information later
4:52	Planning	• Planning meeting • Had printoff of plans • Estimated they would have GC results in an hour (would not leave to drive to tube bundle hut until 5:30) • Confirming info on 35A what c/t • Plugged in at CABA refil • Line out the gate is 20 cars deep on Grasstree road, car to take Lauren to tube bundle hut to train person to take bag samples caught in this queue	•
5:00	Planning	•	• Started to fill out first planning form on computer, system had been paper based until this point.
5:15	Planning	• Planning meeting • All out except 1 person at 35 c/t • Need plan to recover him • Won't be able to rescue on CABA and will need MR if not in fresh air • Need to validate fresh air • CO can be back calculated from bag samples • MRAS has checksheet and signoff for VO	• Modeled 1x1 and 4x4 hole in overcast at 14 c/t • Objectives • Formalise plan • Work out timeline for UG person and how to recover him • Les confirms underpass at 13 damaged not

Appendix 9 Planning Timeline 1

Time	Location -Planning	**Action/activity**	**Key Decisions/comments**
		• MR being called out • If MR didn't deploy what do the do	overcast at 14
5:15	P	•	•
5:30	Planning	• Lauren's ride finally arrives and she heads out to get bag samples. Anticipate 1.5 hour cycles	•
6:10	Planning	• Lubes reports- Deputies to inspect 13 c/t underpass damage • Handover crew debriefed • Call to ERL had no response • 2 transit vehicles for bag samples	• 1193m from 9-35 c/t too far for stretcher • Lauren taking bags now
6:20	IMT	•	• PC Prioritise mines rescue and building a back wall • IC look at 20 c/t for MR FAB • Written plan of options from PC
6:45	Planning	• Planning meeting • Fire is out, keep cool and controlled • Build back wall to contain, IC's call if mine or MR to do. • Gas trends to be run	•
6:52	Planning	• IC stops by and confirms that fire is out	•

Appendix 9 Planning Timeline 1

Time	Location -Planning	**Action/activity**	**Key Decisions/comments**
7:32	Planning	• Planning meeting • Most of group goes back to their normal mine duties • VO and Lauren stay on • Lauren trending bags and populating MRAS • VO working on MRAS info	• Assessors have moved exercise to a MR deployment

Appendix 10 Planning Timeline 2

TIME	Location - Planning	Action/Activity	Comments
01:10	Muster Area	• Siren initiated from Control Room	• Undermanager responded and entered control room
1:13	Control Room	• Undermanager called a group of 12 people into the control room rear office to brief them on initial emergency	•
2:22	Planning Room	• Technical Services Manager Arrived	• He had been nominated as Planning Manager
2:25	Planning Room	• Project Superintendent arrived	• TSM stated Ventilation Officer had been notified
2:40	IMT Room	• Set objectives – Preserve Life; Deal with Injured People; Fight the Fire	•
TIME	**Location**	**Action/Activity**	**Comments**
2:40	Planning Room	• Other members of Planning team started to arrive. Technical Services Superintendent arrived	•
2:47	Planning Room	• Ventilation Officer arrived	•
3:00	Planning Room	• Planning Manager updated planning team on IMT meeting;- • Stated 11 CTB Hdg East Mains there was a vehicle fire, LHD collision with another LHD with fuel pod; • Initial report was the fire was at 13 CT which was not correct; • Ambulance was en route to Mine; • Products of fire reporting to fans and other roads inbye of fire; • The team UG had bagged off C & D heading, don't know where, to reduce air quantity going over the fire to 10m^3/s; • The Turbex™ had been started to fight the fire;	• Team was informed that QMRS were on site and the Doctor had arrived on site.

Appendix 10 Planning Timeline 2

TIME	Location - Planning	Action/Activity	Comments
		• The crew were starting to open man doors in stoppings B-A inbye of fire to short circuit air into the return; • There were 3 injured people at the fire site; • Plan going forward was to Evacuate all people to outbye side of the fire, Fight the Fire, Setting up FAM – no location stated • Actions;- • What could be done with the ventilation to assist with fighting the fire? – to reduce the ventilation quantity over the fire; • Evaluate the gas monitoring • No mention of the damaged underpass/overcast	
3:35	VO Office	• Modelling ventilation system with current information. Details of vehicle door that was open could not be correct as there was not a vehicle door in the location reported. Report stated door open at 10 CT C-D. Actual position of door was actually 10 CT B-C • Modelled brattice at E Mains 9-10 CT as reported – had no impact on air quantity at fire site at 11 CT. • Looking at gas data – 0ff scale CO at all real time points (50 ppm maximum monitors can read). Tube bundle data showed 1,000 PPM up main shaft, which was the maximum the tube bundle CO analyser could read.	• VO was not making the connection that the products of combustion were appearing in all of the roads inbye the fire site. How was the smoke getting into all of the roads?
3:50	VO Office	• ISHR arrived. He had been allowed on site but had no escort ad did not know where to go. VO organised someone from Planning team to escort him to Incident	•

Appendix 10 Planning Timeline 2

TIME	Location - Planning	Action/Activity	Comments
		Controller.	
3:52	Planning room	• Planning Manager updated Planning Team;- • All people now outbye side of fire and accounted for; • Strata being affected by fire – roof fall, not sure where; • Doors opened S Mains 10 CT B-C CT • VO sated that he needed bag samples to be taken from shaft as the CO reading showed was above maximum capable to be monitored by tube bundle system; • ISHR brought in by Incident Controller who stated he had asked the ISHR to assist the Planning Team; • It was mentioned at 04:00 that an overcast had been hit with an LHD at 13 CT B-C in E Mains and damaged. VO stated there was no overcast at 13 CT it was at 14 CT. At this point the Planning Team made the assumption that the overcast was what had been damaged. • Planning Manager asked who they had on site who could take the bag samples from the Tube Bundle shed. Long discussion about who could do it. The Mining Engineer stated that she could take someone over and train them how to do it; • They then had a discussion about who on site who could run the gas chromatograph – group was not sure; • QMRS representative attended and stated that the fire was located at 11 CT D Hdg. He was informed that it was actually in 11 CT in B Hdg; • It was believed that the strata failure was also in 11 CT B Hdg – needs to be confirmed.	•
4:15	VO Office	• VO briefed QMRS Representative on the ventilation situation and gas monitoring results.	• Still the VO was not challenging why they had smoke and products of

Appendix 10 Planning Timeline 2

TIME	Location - Planning	Action/Activity	Comments
			combustion in all of the headings.
4:25	VO Office	• Planning Manager came in and informed the VO and QMRS Representative that there was a man left at the Refill station at E Mains 35 CT B-C Hdg. He could not walk and had been left there plugged in to the refill station as he was in an irrespirable atmosphere and would need to be recovered.	• VO stated that this was incorrect information as the Refill Station was located in 35A CT B-C Hdg. He showed the emergency plan which showed the correct location of the refill station.
4:30	VO Office	• Mining Engineer came in and stated that the Fire Span Gas for the Tube Bundle and GC was US – fault with manifold. Sourcing another one from Grasstree	•
4:37	VO Office	• Confusion with VO and others regarding the damaged overcast reported as 14 CT C-D. If this is true then the ventilation model shows that if this was the case then the products of combustion would report straight to the upcast shaft. The VO modelled various size openings in the damaged overcast and concluded that if a whole panel had been knocked out then the air inbye the overcast in D Hdg would reverse and the LW would not have seen smoke. He concluded that the damage to the overcast must be small. They still not try to explain why there was smoke in C and D headings. • There was confusion as to who is or is not accounted for underground. Various numbers being quoted. – miss information. • QMRS Representative briefed VO on the gas and ventilation information they required for the QMRS for their deployment.	•
4:48	Planning Room	• Team was informed that it be one hour before the first	•

Appendix 10 Planning Timeline 2

TIME	Location - Planning	Action/Activity	Comments
		bag sample results	
4:50	IMT	• It was stated that there was one CMW at 35 CT B-C Freak Station (actually 35A CT); • The damage to the overcast at 14 CT was raised. The IMT assumed that the man left at 35CT must be in clean air based on the modelling done by the VO based on the overcast being damaged.	• No one corrected this misinformation
5:15	Planning Room	• Team still did not realise that the Underpass at 13 CT had been damaged. Still believed it was 14 CT Overcast that was damaged.	• Assessor informed the Planning Team and the Incident Controller of the error in reporting and that it was the underpass at 13 CT that was damaged and not 14 CT Overcast.
5:30	VO Office	• VO ran the ventilation model with the correct information regarding the damaged underpass at 13 CT. This showed results similar to that what the gas data was showing. • The Mining Engineer left to take first bag sample.	• VO never thought of using Ventsim to introduce a contaminant at the scene of the fire to wee where the contaminants would go. This would have been a good tool to use to validate the model with the actual gas data around the mine.
6:10	Planning Room	• First bag sample taken. Still had not been run through GC	•
6:45	Planning Office	• FAB established at 10 CT. No telephone at FAB, using mobile phone. Did not know number of mobile; • ISHR asked how long did the person left at 35ACT refill station had before he ran out of air. After some discussion it was estimated that there would be enough air in the refill station to support him for almost 2 weeks • The fire was nearly out, on fire watch. CO readings on	•

Appendix 10 Planning Timeline 2

TIME	Location - Planning	Action/Activity	Comments
		inbye side of fire still high (55ppm);	
7:30	Planning Office	• Stopping built inbye of fire, filling up with foam; • VO to monitor trends for Mines Rescue deployment to recover CMW left at 35 CT	• ISHR stated he was leaving site as he had other work to do not related to the emergency exercise
08:20	Planning Office	• Mines Inspector arrived on site. He had been notified of the incident at 2:00 AM. He had been staying in Emerald at the time but did not arrive on site until 8:20 AM	• Mines Inspector not able to take part in the emergency at the mine for over 6 hours after the notification.

Appendix 12 Logistics Timeline

Time	Location - Operations	• Action/activity	• Key Decisions/comments
0112	Muster Area	• Alarm sounded, brief of incident called	• Discussion in control room
0122	Muster Area	• Ambulance deployed – 2 occupants, Trauma kit, defib, UPEE signed	• Good response and prepared for different injuries (injuries were unknown)
0132	Muster Area	• Lamp room attendant box issued • Lamp room and tagboard were no roaded • Names of workers were scribed	• Tagboard control, duty card task was to funnel workers past board, not no road board. LEARNING- emergency tag board required for response personnel CMWs were still tagging onto a quarantined tagboard
0138	Muster Area	• Workers directed to barricade to funnel past area	• Good barricading of area to guide workers past area
0211	Muster Area	• Handover with SSE from UM, 3x injuries, fighting a fire, change in ventilation to restrict flow to fire • SSE- stated Dr was already on route	• Beginning of miscommunication
0221	IMT Room	• IMT initiated, boxes taken and handed out • Vests donned • Situation: fire at 13c/t D Hdg, 3 injuries, FAB established in unknown location O/B of fire • Ambulance on route to incident • Injuries known- broken leg and burns • Crews commenced evac • Turbex™ not currently being used (VO decision)	• No duty cards were read, nor was the time given to re-familiarise IMT with their roles
0224	IMT Room	• Action to Operations controller to establish evacuation coordinator and account for workers	• Crews evacuating- good decision

Appendix 12 Logistics Timeline

Time	Location - Operations	• Action/activity	• Key Decisions/comments
0230	Ops	• John assigned Operations cards/ sub-roles to other staff, notified them of the situation • Set up room	• Actions assigned to meet ambulance and evacuation coord to account for workers (good decision)
0240	IMT Room	• JF handover to IMT that there was a worker in the FAR, Operations controller then left the room to bring UM in to provide handover to first IMT	• Still lack of communication between control room and IMT
0246	IMT Room	• First official IMT- Fire in 11c/t B Hdg, mine polluted, evacuating, turbex being used, brattice on O/B side of fire to restrict ventilation • QMRS turned up to site without being called??? QMRS were to be put on stand by but appeared onsite??	• Incorrect location again
0250	IMT Room	• Decision to retreat persons and establish teams to fight fires using the CMWs evacuating	•
0250	IMT Room	• Action to ops- establish dayshift fire fighting teams and assess skill levels	• Operations controller had to scribe all notes and actions
0305	Operations controller	• Handover to Ops	• Emergency management program desperately needed, lots of mis-communication due to hand written notes going through three different people, computer log of ops actions also kept • Excellent work assigning actions to ops coordinators

Appendix 12 Logistics Timeline

Time	Location - Operations	• Action/activity	• Key Decisions/comments
0313	Ops room	• QMRS handover, discussion surrounding their required risk assessment for entry to mine	• Operations controller took QMRS to all IMT rooms to familiarise QMRS worker with locations and key personnel
0323	Ops room	• PRE IMT meeting- no 3rd injured person, all workers accounted for • Turbex™ damaged, second one obtained • Ambos onsite to take injured offsite, unsure of hospital	• Excellent ops team work, coordinators knew their roles and what was required of them
0330	IMT Room	• Update from U/M again- 2x LHDs with a diesel ops, • All crews,	• No communication between U/M and Operations controller
0340	IMT Room	• Action for Ops for QMRS to be activated and GAG to be put on standby	•
0343	IMT Room	• Informed that strata starting to fail, decision made to run timber and props in • Mission change- Safely fight fire, secure roof	•
0353	Ops	• QMRS mobilised	•
0354	Ops	• Handover with ops- Informed cords of failing roof, new actions assigned to group- name of injured worker, activate QMRS and GAG to be on standby	•
0405	Ops	• Further update- 3rd injury- sprained ankle , persons no longer accounted for, 16 CMWs missing	•
0420	Muster area	• Handover with U/M- props on scene, informed that a worker has been left inbye of fire at 35 c/t ERL- A-B Hdg	•

Appendix 12 Logistics Timeline

Time	Location - Operations	• Action/activity	• Key Decisions/comments
0445	Ops	• Ops decision to roster fire fighting crews to reduce fatigue of workers	• Good scribing, actions clears
0450	IMT	• U/M handover to IMT- 1 CMW inbye of fire, vent model shows he is in fresh air, damaged overcast at 14c/t, Vent model shows the worker is in FA, Damaged overcast at 14c/t E/Mains, extra persons are out of the pit and others are fighting the fire. • Decided that QMRS will use the surface tagboard due to no ER tagboard • Fire fighting teams have been arranged for DS • 13c/t to be back wall for turbex (brattice) • Not to save person under CABA • Shift in focus is now risk to persons • Mission- rescue CMW, fight fire, secure strata • Decision to read duty cards?	• Ops handover was the same as Ums (why two handovers?) • ER tagboard required for site for workers entering once board has been quarantined
0515	Ops	• Whilst waiting for others reissued duty cards. • Ops update- no update on strata, no update on Turbex™ usage, ER tagboard established, list of QMRS personnel obtained. No one to	•

Appendix 12 Logistics Timeline

Time	Location - Operations	• Action/activity	• Key Decisions/comments
		attempt to save person	
0535	H/over with UM	• Props under under lip, 8x drums of foam, no idea on usage rate, surface board to be used as ER board.	•
0540		• Arranging DS to fight fire with deputy IC • There was another mis communication- worker is at 13c/t u/pass in irrespirable	•
0600	Logistics	• Working out time on refil station (how long worker has air)	•
0605	IMT update	• Foam is coming to site • FAB is at 10c/t • 10 QMRS personnel onsite • Worker has 263 hours of air in refil	• Finally know where the FAB is
0641	Ops	• Post IMT meeting	•
0645	Phone call	• Fire is out U/G	•
0715	IMT Room	• IC- We would have built a back wall for the Turbex™ • Geoff Nugent- new status • IC- new mission ensure fire does not reignite, rescue worker	• Exercise was changed at this point, no brattice wing was built

Appendix 12 Logistics Timeline

Time	Location - Operations	• Action/activity	• Key Decisions/comments
0732	Ops	• Plan is QMRS to recues worker and ensure fire does not re-ignite • Discussed Resources- MPTS	•
0815	IMT Room	• Rescue plan- 9c/t • Irresp atmos- 20c/t • MRAS Risk assessment only	• No risk assessment completed to rescue worker
0920	Response	• Delays in having tags made for QMRS	• LEARNING have pre-made tags to avoid delays such as this one
Time	Location - Logistics	• Action/activity	• Key Decisions/comments
01:12	Muster Area	• Emergency alarm sounded	•
02:10	Muster Area	• SSE arrives on site	•
02:21	IMT Meeting	• IMT formed	• SSE nominates himself as IMT Controller. • Logistics and Planning Controllers on their way. • Duty cards retrieved.
02:23	IMT Meeting	• IMT Controller Update	• 3 injured persons underground – 1 has potential broken/burned leg. • Vehicle fire • FAB has been established • Ambulance on way to site • ISHR phoned at 01:52 • Mines Inspector phoned at 01:59 • Objectives: • Preserve life

Appendix 12 Logistics Timeline

Time	Location - Operations	• Action/activity	• Key Decisions/comments
			• Supress the fire
02:33	IMT Meeting	• Logistics Controller (LC) arrives	•
02:34	Logistics	• Logistics Team formed	• Contact made with CHMS – contracting company for the surface • Security box retrieval initiated
02:40	Logistics	• Security box, 3 x radios and keys collected from comms.	• Radios allocated. Channel 1 set
02:42	Logistics	• LC leaves to attend the IMT meeting	•
02:45	Logistics	• Additional logistics team members called	•
02:47	Logistics	• Arranged for access gates 3, 4 and 5 to be locked. Team member asks for all 5 surface light vehicles to be confirmed at locations.	•
02:48	Logistics	• Team arranges for 1 x personnel to attend the turnstile gate, and 1 x personnel to attend the portal	• Workforce arriving at turnstile to be directed to the HSEC room
02:52	Logistics	• All surface light vehicles accounted for including their fuel status	•
03:00	Logistics	• LC returns from IMT meeting and provides an update to the team.	• Vehicle interaction @llct/t East Mains - Fire • Smoke and pollutants heading in bye of 13c/t East Mains. • 3 x crews evacuating through D-heading East Mains - All personnel accounted for. • Turbex™ has just been started • Deputy heading to 13c/t to open doors 8-A

Appendix 12 Logistics Timeline

Time	Location - Operations	• Action/activity	• Key Decisions/comments
			heading • 3 x injured persons (2 on way out, 1 on surface) • Portal and drift controlled • Sentry@ gate guiding ambulance - Ambulance notified. Diesel workshop assisting. • QMRS put on standby. • <u>Tasks:</u> • Foam supply – contact local mines • Liaise with doctor or medic that has arrived on site (first aid room).
03:11	Logistics	• Deputy IMT controller arrives for check-in	• <u>Tasks</u> • Secure access points • Establish work area
03:16	Logistics	• Operations Controller arrives with QMRS Operations Manager	• Introduction to QMRS Operations Manager
03:17	Logistics	• Financial Coordinator and Supply Coordinator arrive	•
03:20	Logistics	• 3 more staff arrive: • Medical facilities • RC01 Portal • Front gate site security	•
03:21	Logistics	• Briefing from Logistics Controller	• <u>Sit-rep update</u>: • Sentry staff sent around site to front gates and control access around site. • Confirmed ambulance is on way to site • 30,000 litres of fuel on site • Fire fighting (fluorine free) foam on site:

Appendix 12 Logistics Timeline

Time	Location - Operations	• Action/activity	• Key Decisions/comments
			• 40 drums on loader on way to pit (1%) (including fire substation drums) • 11 drums in warehouse (1%) • 10 in store (3%) • Primary objective: • Evacuate personnel to outbye side of fire and treating injured personnel • Secondary objective: • Fight the fire
03:32	Logistics	• LC leaves to attend IMT	•
03:33	Logistics	• Staff member sent to check security hut	•
03:34	Logistics	• Staff member sent to check muster area	•
03:36	Logistics	• Team advised that Mines Rescue have 10,000 litres of foam available, 2 hours away.	•
03:38	Logistics	• Staff member sent to check availability of lighting plant	•
03:44	Logistics	• Medical facilities staff member returned to provide update.	• 2 injured personnel have been treated. One more to be treated once they arrive at the surface.
03:46	Logistics	• CHMS staff member going to drift security station to relieve sentry.	•
03:48	Logistics	• RC01 Portal sentry arrives.	•
03:53	Logistics	• LC returns and provides IMT briefing	• Incident confirmed as vehicle collision. • Turbex™ running but not containing fire.

Appendix 12 Logistics Timeline

Time	Location - Operations	• Action/activity	• Key Decisions/comments
			• 2 x injured persons on way to hospital in ambulance. • More fire fighting foam needed – 10,000 litres at QMRS • QMRS to Establish FAB • Crews Evacuating -Status TBC • Planning to do Gas & Vent Review • Polluted Mine In bye 13c/t East Mains • Brattice Outbye of Fire • Turbex™ Started -10rn3/s over fire - Failed in Service • Surface ERT activated & front Gate Security in place at CHPP • 11c/t 8-Heading Strata Failing - CMWs getting timber ready • Loader had full pod of diesel on front. • All individuals inbye have been accounted for and at FAB • Turbex™ in situ failed in service • Spare Turbex™ in pod on route • Lost firefighting capability for a period of time - line burst. Restored • 19 people reported as missing (post meeting) • Establishing a triage area on site. • Primary objectives: • Preserve Life • Safely Fight the Fire

Appendix 12 Logistics Timeline

Time	Location - Operations	• Action/activity	• Key Decisions/comments
			• Safely Secure the Roof
04:29	Logistics	• Deputy IMT Controller arrives for check-in	• Asks for 2 more staff members to be contacted and attend site.
04:32	Logistics	• Ops Controller arrives for update	• Triage set-up • QMRS are being mobilised • Updated list of personnel provided
04:36	Logistics	• IMT Controller arrives and provides update/requests	• Holding statement provided. • Provided updated instructions for personnel arriving on site. • GC and fire space gas cylinder being obtained from Grasstree • Simtars Mackay have also been contact to obtain mine fire cylinder.
04:43	Logistics	• Loader confirmed as being refulled	•
04:49	Logistics	• LC leaves to attend IMT meeting	•
04:58	Logistics	• Update mines rescue lists provided to logistics and copy sent to front gate	•
05:17	Logistics	• LC returns and provides de-brief	• All Crews @ FAB • Need to establish contact with Next of Kin of Injured persons • Planning to do Gas & Vent Review • Polluted Mine lnbye 13c/t East Mains • Brattice Outbye of Fire • Surface ERT activated • Front Gate Security in place at CHPP • All CMWs accounted for @ FAB

Appendix 12 Logistics Timeline

Time	Location - Operations	• Action/activity	• Key Decisions/comments
			• 11c/t B-Heading Strata Failing -CMWs getting timber ready & Emergency PODS • 2 x Loaders - 1 Loader had full pod of diesel on front. • Damaged O/Cast 14c/t East Mains • Currently evacuating non-essential personnel • QMRS -4 confirmed • Additional driftrunner full of foam has been sent down • Primary objectives: • Preserve Life • Safely Fight the Fire • Safely Secure the Roof • Plan to recover person @ 35c/t
05:26	Logistics	• Breakfast confirmed	•
05:27	Logistics	• Assistance VO arrives from planning team	• Planning team have plan in place to extinguish fire. • Seal 200m section. • Requesting access for 2 personnel to attend 18 c/t tub bundle hut for collecting bag samples
05:30	Logistics	• Advised that the doctor has been dismissed from the exercise	•
05:33	Logistics	• Request from planning to escort 2 x personnel to the TB shed.	•

Appendix 12 Logistics Timeline

Time	Location - Operations	• Action/activity	• Key Decisions/comments
05:42	Logistics	• Update from Planning Team	• Planning team working summary • Have a plan to extinguish fire • Seal 200m section of roadway • Location of roof fall is a different location
05:47	Logistics	• Phone call from underground to source more foam.	• Logistics confirmed 11 barrels in the store
05:51	Logistics	• Phone call to clarify where drift runner from mine to go.	• Advised to go to quarantine. • Sought further advice on mine personnel in the drift runner.
05:56	Logistics	• U/g personal sent to quarantine area.	• Confusion over quarantine vs muster area.
05:58	Logistics	• SSE clarified that all returning u/g personnel are to head to the muster area.	•
06:00	Logistics	• 10,000 litres of foam arrived on site	•
06:10	Logistics	• Advised that a mines recue person had come through the gate separately and escorted to the mines rescue hut.	• Mines rescue access clarified and resolved at front gate.
06:15	Logistics	• LC leaves to attend IMT meeting	•
06:37	Logistics	• List of all u/g vehicles obtained and advised personnel available at HSEC meeting room.	•
06:42	Logistics	• LC returns and provides de-brief	• All Crews @ FAB or Heading Out • FAB Established 10 c/t B to A • Injured person not responded to comms • Need to establish contact with NOK of Injured • Fire Under Control -Still Not Out

Appendix 12 Logistics Timeline

Time	Location - Operations	• Action/activity	• Key Decisions/comments
			• Planning to do Gas & Vent Review • Polluted Mine lnbye 13c/t East Mains • llc/t Strata condition unknown. 3 Props Set secured under lip. • Turbex™ Started -10m3/s over fire -Failed in Service • 13c/t Underpass Damage - Rob Havemann is in lrrespirable atmosphere. • RSHQ Mines Inspectorate on way to site. • 8 Drums of High Expansion Foam remaining - Fire Under Control but not extinguished. • All CMWs accounted for@ FAB • 2 x Loaders - 1 Loader had full pod of diesel on front. • QMRS teams -16 personnel confirmed (list of names to Logistics Controller) • Primary objectives: • Preserve Life • Safely Fight the Fire • Plan to recover injured person @ 35c/t • Deploy QMRS as part of the plan • Other discussions • 30 min set-back because of incorrect location • Debate over FAB and mines rescue options • Logistics to investigate other options incl

Appendix 12 Logistics Timeline

Time	Location - Operations	• Action/activity	• Key Decisions/comments
			alternate FAB location, and GAG. • Plan for building a wall using QMRS • Firefighting to continue. • More foam still needed
06:46	Logistics	• Breakfast arrived and being distributed	•
06:50	Logistics	• Notified of CHMS person entering site without authorisation (through the barrier)	•
06:59	Logistics	• Notified that a Mines Inspector has arrived at gate.	• To be escorted through to the Incident Management meeting room.
07:15	Logistics	• LC leaves to attend IMT meeting	•
07:20	Logistics	• 30 seater bus arrives at gate for 8:30am pick-up	•
07:22	Logistics	• Grasstree mine contacted to located the GC mine fire gas cylinder.	•
07:53	Logistics	• Planning team provided a contact to Simtars to seek assistance.	•
08:04	Logistics	• Logistics team contact Simtars and received confirmation that the Simtars Mobile Gas Laboratory is available to deploy to site by tomorrow morning.	•
08:15	Logistics	• Person at security station 4 swapped roles to underground and have not advised the Logistics Controller.	•
08:24	Logistics	• LC returns from IMT	•
08:25	Logistics	• Exercise concluded for all underground staff. Advised that all operational office staff are	•

Appendix 12 Logistics Timeline

Time	Location - Operations	• Action/activity	• Key Decisions/comments
		returning to normal duties and u/g staff to be advised.	

Appendix 13 QMRS Operations Manager Timeline

Time	Location - QMRS	Action/activity	Key Decisions/comments
~ 0300	Surface	QMRS employee Clint Battese on site and observed standing at end of lamp room. Directed follow operations coordinator.	
0305	Operations room	Operations coordinator gave a briefing to the Clint ➢ Incident that has occurred ➢ Discussed options for the response ○ Vent change described ○ Brattice being set up inbye of fire ○ Turbex™ being deployed ○ A Morris underground coordinating response ○ A Morris UG opening doors for smoke dilution ○ Spoke about getting spare Turbex™ from Grasstree ➢ Primary objectives from IMT discussed ○ CMWs to evacuate to outbye of the fire ○ Fight fire	➢ There was no indication that the VO had modelled the planned vent changes, from later conversations a vent change was made, and ventilation was lost in a heading underground. ➢ During the first update there was no consideration of commencing MRAS or any other type of risk management for a QMRS deployment. ➢ Comment was made from the QMRS employee that gas trend data would need to be gathered for trending before the rescue deployment can be made.
0309	Logistics	Clint introduced to Logistics coordinator and provided a contact number for himself to the logistics team. At the time a question was raised on what quantity of High expansion foam could be supplied by the QMRS.	➢ Decision was made by the QMRS employee of site to be the contact point between site and himself. ➢ The Dysart station was being manned during the incident and there was the option to provide the station number to the logistics team as a contact point, this would have reduced the workload on the onsite QMRS Operations manager

Appendix 13 QMRS Operations Manager Timeline

Time	Location - QMRS	Action/activity	Key Decisions/comments
0312	Planning	Clint introduced to planning team, while in room Clint did mention that he would require trend data for gasses to be provided so that a mines rescue response	➢ The request for gas trend data was made prior to the formal decision to deploy QMRS was made
0320	Outside of operations room	Clint received phone call from T Jackson of QMRS. ➢ Clint updated Tim on what he knows ➢ Stated that 0320 he was due back in planning room ➢ Site still accounting for CMWs	➢ Clint stated that if the collection of trend data was not started soon a potential QMRS deployment would be delayed. ➢ At this point the QMRS had still not been requested to be deployed. No mention was made during the conversation on the risk management that needs to be completed for team deployment.
0325	Operations room	General observation in room	➢ Noted names on persons at risk board o Names on board were A Morris, G Wilson and N Freeman. Listed on the board was the statement that A Morris and N Freeman were outbye of the fire (these were in my opinion not at risk) o IMT board, IMT action plan boards were left blank o Task and actions detail board only mentions that the next IMT is at 0330 – no update info ➢ Tools were in place but not being used
0350	Planning room	ISHR S Watts on site and walked into planning room, explained to the team that he was on site	

Appendix 13 QMRS Operations Manager Timeline

Time	Location - QMRS	Action/activity	Key Decisions/comments
		and has not been given a briefing on what has occurred or what response is going on. He also stated he had not been assigned an escort.	
0355	Operations room	Clint from QMRS given direction to begin deployment of rescue teams. ➢ Update from Clint that there were 2 from Grasstree and 2 from Aquila available now.	Clint told to liaise with planning, information given to Clint was ➢ Told FAB set up outbye of the fire ➢ Fire location confirmed as 11ct D hdg East Mains ➢ Strata failure was in place at 11ct D hdg East Mains
0417	Planning room	➢ Luca identified that gas monitoring being off scale would limit ability to trend gases and would delay rescue deployment	➢ Clint and Luca spoke about getting the bag samples from the tube bundle points
0430	Planning room	➢ Planning leader entered VO office and updated VO and Clint that one person is inbye and left at the refill station connected ➢ OCN employee entered VO office and stated that the fire span gas cylinder was found to be US (for real) and was leaking when attached to the GC	➢ The QMRS official (Clint) was told by the planning team leader to factor in the missing person to future planning, still planned to deal with the fire and was also told to deal with the missing person ➢ At this point knowing that rescue was going to be deployed no risk management still had been commenced ➢ In regards to the fire span gas conversation was held to state that they would get Paul Doherty to get a spare one from Grasstree ➢ In the Planning room the IMT resources board had no information

Appendix 13 QMRS Operations Manager Timeline

Time	Location - QMRS	Action/activity	Key Decisions/comments
			on them (same as the operations room)
0503	Outside of planning room		Spoke to Clint about who is doing MRAS. Not considered as of yet. Delay of 3 hours so far. T Jackson and C Hanrahan from QMRS at Dysart and D Prince on route to mine.
0525	Muster area	Site employee asked to set up a section on the tag board for rescue team members, IMT not sure of who from rescue is on site	Site not aware of the T card system in use by QMRS or that a substation coordinator would have this information readily available
0535	Rescue station	Clint gave briefing to rescue teams at the substation ➢ Plan communicated to the team was about fire fighting	Did not have all of the information for the team briefing, unable to provide contact numbers etc. ➢ No plan developed for rescue team activities yet
0555	Planning room	Luca and team in planning discussed setting up a relay process for the bag samples	Considered as a good idea to set up people in specific roles (driver, sampler and GC operator) as this would reduce the time to complete the information gathering.
0625	Rescue station	Clint gave briefing to rescue teams at the substation, discussed ➢ Overview ➢ Fire winding down ➢ Missing CMW at 33a ct B-C hdg ➢ Fire at 11ct B hdg ➢ FAB will be at 9ct B hdg ➢ Distance to CMW spoken about ➢ Spoke about using driftrunner by one of the teams ➢ QMRS plan ➢ Team 1 plan	Although location of missing person was known the lamp and SCSR number was able to be provided to the team members.

Appendix 13 QMRS Operations Manager Timeline

Time	Location - QMRS	Action/activity	Key Decisions/comments
		➢ Team 2 plan ➢ Team 3 plan ➢ FAB controller and assistant nominated	
0710	Operations room	Clint asked for name of missing person and also their lamp and SCSR number D Prince from QMRS was sorting out the captain's task sheet at the rescue station Bags were coming back in now for authority to enter	Operations team could not provide the information straight away. The persons at risk board in the operations room did not list this information
0730	Operations room	Operations group meeting ➢ Rescue operation was to focus on recovery of mine worker ➢ Team to make sure fire did not reignite ➢ Clint asked to attend next IMT meeting at 0810	Whilst nature of the task was discussed at this meeting the teams task sheets had been started 20 minutes prior. QMRS asked for confirmation of missing persons lamp and SCSR number, this still took time to receive Clint asked for 2 driftrunners and 2 OCN employees to operate them
0737	Planning room	Update form VO to Clint ➢ Containment wall in place ➢ Irrespirable in D hdg ➢ Reducing flow from B to D hdg ➢ Distance of travel for teams ➢ 20ct less than 30ppm as modelled ➢ Fresh air 33-35 ct east mains due to downcast shaft ➢ Route of travel in to be D hdg ➢ Travel by driftrunner ➢ 20-33 ct contaminants are expected	Thorough and relevant information presented by VO

Appendix 13 QMRS Operations Manager Timeline

Time	Location - QMRS	Action/activity	Key Decisions/comments
		➢ B hdg irrespirable atmosphere ➢ Visibility could be compromised 25-33 ct	
0752	Rescue station	Clint updated rescue teams ➢ Information from VO communicated	Discussion amongst the teams about the FAB being at 9ct. J Vardenga told group that phone at 9ct had been removed and that there was no longer a phone at this location. Information was not followed up.
0814	Rescue station	Observed team completing preoperational checks on BG4 suits and minimum equipment	One team member found suit with cylinder pressure below required pressure One team member turned oxygen on while masked not donned, resulted in air from suit being wasted and a cylinder change was required
0910	Go line	Team briefing from Clint and IMT leader D Stone Spoke about FAB location and also 33ct downcast shaft Teams deployed underground (deployed but it should be noted that in a real event the teams would not have been deployed due to no risk management having been conducted – No MRAS assessment was completed)	During team briefings no team member noticed that the captains task sheet had not been signed by the IMT leader, only signed by QMRS (copy of task sheet attached)
	FAB	Found no landline at FAB location (9ct East mains) Called IMT to confirm that FAB can use mine phone as communications, permission granted and confirmed new FAB number is 5739 with IMT and teams. Duty card 4 being completed by FAB assistant as	Teams were unsure of leaving FAB with the teams mine phone being unreliable, spoke to the teams about utilising the 30 minutes off comms as land lines were in known locations inbye. Teams deployed in driftrunner, when doing so teams should consider travel pace as gas

Appendix 13 QMRS Operations Manager Timeline

Time	Location - QMRS	Action/activity	Key Decisions/comments
		FAB was being set up. Standby team completed environmental readings for the FAB whilst it was being set up. There was a lack of urgency getting the operational team under oxygen while at the FAB	readings can be missed No two-minute stop completed by team at irrespirable point as per operational guidelines.

Appendix 14 QMRS Rescue Team Response Timeline

Time	Location - QMRS	**Action/activity**	**Key Decisions/comments**
04:26	Oaky North Mines Rescue Substation	• OCN Staging area coordinator (TC – 5B) arrived to check building was open and ready to receive team members.	•
04:29		• OCN Mines Rescue (MR) Coordinator (TC- 5D) arrived to activate resource management board and T card system	• Did not identify that there was a QMRS Duty card (QMRS DC 5) located on the wall in substation to assist with this role initially. Note, OCN TC-5D does not prompt individual to utilise the QMRS Duty Card)
04:32		• Resource management board ready for use	• T Card started by MR Coordinator but not fully completed
04:38		• OCN Staging area coordinator (TC – 5B), tasked to set up a staging area for receiving equipment, QMRS trailers	•
04:55		• First Mines Rescue team member arrives from offsite (response from Tieri after receiving ALERTS callout). Fills out T Card	•
		• Verbal update of incident situation given by MR Coordinator (TC-5D). Team member recorded info in notebook.	•
05:00		• Mines Rescue team member arrives. Fills out T Card, receives verbal update of incident from MR Coordinator.	• This team member seemed to be aware that there should be a QMRS Substation Duty Card but was unsure of the location it was kept.
05:04		• First Mines Rescue team member asks if he should write incident details up on whiteboard to improve efficiency of information flow for other team members arriving. Agreed to by MR Coordinator.	• Good prompt, team member identified early that this would assist information flow and not tie up MR Coordinator with multiple briefings.

Appendix 14 QMRS Rescue Team Response Timeline

Time	Location - QMRS	**Action/activity**	**Key Decisions/comments**
05:10		• MR Coordinator phones Control room to receive an incident status update.	•
		• Two QMRS team members arrive while MR Coordinator on phone. Receive an update detailing there is one CMW left at East mains 35 c/t A-B ERL (Emergency Response Location), unwell and connected via CABA to ERS (Quickfill Station)	•
05:13		• Mines Rescue team member prompts MR Coordinator on what else can they do to prepare for deployment if required?	• Good prompt as it was identified if a man has been left underground, they may require Mines Rescue assistance to rescue. • MR Coordinator gives instructions to commence checking two sets of minimum equipment
05:15		• White board updated with latest information	•
		•	• MR Coordinator identifies QMRS Substation Coordinator DC 5 on wall in plastic holder. Prompted by L1 assessor after MR Coordinator commented that a checklist would be beneficial.
05:19		• Two team members arrive and receive a verbal update. Fill out T Cards. One team member provides a list of QMRS personnel who have responded via ALERTS that they are available to attend.	• 34 QMRS Team members on list as available to respond.
05:23		• OCN Team member arrives, receives update from MR Coordinator/Substation Coordinator	• MR Coordinator identifies this experienced team member as a suitable replacement due to coming to end of his night shift.

Appendix 14 QMRS Rescue Team Response Timeline

Time	Location - QMRS	**Action/activity**	**Key Decisions/comments**
			Provides an update and commences hand over of role of MR Coordinator and Substation Coordinator.
05:27		• One team member leaves and advises is unavailable due to a family issue off site.	•
		• Two additional bag sample bags identified in minimum equipment, removed as not in good condition and surplus to minimum requirement.	•
05:31		• QMRS Acting Operations Manager (QMRS DC 3) arrives.	•
05:33		• QMRS Acting Operations Manager provides update to Substation Coordinator and other team members	• Substation Coordinator requests confirmation of IMT phone number, unknown, to be confirmed.
05:41		• Nightshift Mr Coordinator/Substation Coordinator leaves.	•
05:42		• Substation Coordinator asks QMRS Acting Operations Manager where to stage team members and equipment. Advised QMRS Trailer is on its way.	• QMRS Acting Operations Manager indicates in a real emergency they would use BG4 (Long Duration Breathing Apparatus) from Substation, but for the exercise they will use the BG4 arriving on the QMRS trailers.
05:51		• Forklift arrives to clear area in front of Mines Rescue Substation of equipment such as Quickfill Stations, to allow better staging area for equipment, and easier access for QMRS trailers	•
05:55		• Team members discuss with Substation Coordinator rearranging current set up and location of Resource Management Board and equipment in Mines Rescue Substation to	• Good prompts and observations by experienced team members. • Substation Coordinator appoints another Team member as Assistant Substation

Time	Location - QMRS	**Action/activity**	**Key Decisions/comments**
		improve flow and functionality	Coordinator and tasks with relocating into larger room in Mines Rescue Substation building.
05:58		• QMRS Technician (QMRS DC-2) arrives with QMRS Equipment trailer from Dysart Mines Rescue Station	•
		• Minibus with 6 x team members from Aquila Mine arrive. Receive update, asked to fill out T Cards	•
06:04		• Two more OCN team members arrive. Request to fill out T Cards.	•
06:06		• Two team members have arrived with Tech Vests and request Assistant Substation Coordinator if there are any spare cap lamp belts available.	• Ideally, team members need to respond to an emergency deployment with all of their required personal equipment, as at times additional equipment may not be available.
06:11		• Briefing by Substation Coordinator to all team members around a Mine plan. Layout of OCN mine, relevant current incident information	• Team members asked several questions to clarify information, thoughts on what role Mines Rescue teams may play in assisting firefighting activities or rescue of CMWs.
06:14		• QMRS Trainer arrives, fills out T Card, confirms who is currently acting as Substation Coordinator and assistant. Asks of status of equipment, has it been tested?	• QMRS Trainer leaves Substation Coordinator in this position and provides direction, guidance and support as necessary.
06:24		• Two team members arrive from Grasstree Mine, plus one from Aquila	•
06:26		• QMRS Acting Operations Manager updates all team members in Substation with current status and relevant information. Confirms that all Team	• *Fire subsiding but not out, turbex being run -located 11 c/t B heading (commenced at 13 c/t)*

Appendix 14 QMRS Rescue Team Response Timeline

Time	Location - QMRS	**Action/activity**	**Key Decisions/comments**
		members have completed a T Card.	• *Missing Coal Mine worker 35A c/t B-C heading, last known location* • *No formal plan yet, awaiting gas Data from OCN* • *Not prepared to send a team inbye an active fire* • *Likely FAB location 9 c/t, distance to 35A c/t approximately 1900 mts* • *Too large a distance to stretcher a casualty, will need to utilise man transport if gas levels allow* • *Need to prepare 3 teams and associated equipment* • *Will nominate 3 Team Captains and FAB Controller* • *Returning to IMT and will provide more information on return* • *Answered questions from team members*
06:29		• QMRS Trainer advises who the three Team Captains, FAB Controller and assistant will be, after discussion with QMRS Acting Operations Manager	•
06:36		• Team Member asks for confirmation of incident details and locations as some conflicting information on white board	• Good awareness by team member that information was conflicting and seeking clarification
06:38		• QMRS Technician with QMRS Equipment trailer arrives from Blackwater Mines Rescue Station (QMRS DC-2)	•

Appendix 14 QMRS Rescue Team Response Timeline

Time	Location - QMRS	**Action/activity**	**Key Decisions/comments**
		• Team member arrives from Ensham Mine. Spare cap lamp belts arrive from store.	•
06:45		• FAB Controller and assistant commence preparing and checking FAB equipment from QMRS Equipment trailer	•
		• QMRS Trainer checking team members Oxygen currency status on laptop, allocating team members to teams in consultation with Substation Coordinator	•
06:51		• QMRS Trainer updates team members and advises who is in each team.	•
06:54		• QMRS Trainer receives a call from QMRS Acting Operations Manager	•
06:57		• QMRS Trainer updates team members, advises selected teams to set up their BG4's and minimum equipment in CABA room in preparation for Captains checks.	•
07:02		• Team member (from Aquila) unfamiliar with new style BG4 masks being used. Asked for familiarisation which was given by team member from OCN	• QMRS to confirm that Team members are aware of the different versions, styles of BG4 mask available during training rounds.
07:05		• Preoperational checks on FAB equipment continuing (FAB Controller and Assistant)	• Mine Sites to consider locations for Team members to store kit bags on arrival along with other staging areas and substation flow.
07:10		• QMRS Trainer updates Team members	• *Team 1 and Team 2 to get equipment ready* • *QMRS Acting operations Manager returning to substation and will assist with*

Appendix 14 QMRS Rescue Team Response Timeline

Time	Location - QMRS	**Action/activity**	**Key Decisions/comments**
			preparing Captains Task sheets
07:25		• QMRS Technician demonstrates the joining of radio aerial using insulated joiners to several team members	•
07:29		• Team Captains preparing folders and Captains team sheets	•
07:36		• QMRS Trainer and Substation Coordinator confirm that there is an Oaky North team member allocated to each team to be able to drive man transports	• Resource Management Board use from team standby to active, to FAB etc not fully understood – more and regular training necessary to improve team member knowledge and understanding
07:50		• QMRS Acting Operations Manager returns. Updates QMRS Trainer and they commence drafting Captains Task sheets.	•
07:56		• QMRS Acting Operations Manager updates team members	• *Advises that issues with Safegas not talking to QMRS "stuff", unable to get trending.* • *Has been advised that assume you have trends of gases* • *Fire is out* • *FAB to be set up 9 c/t D heading* • *Will verify if there is phone communication there, and if not will need to move FAB location. (Advised by OCN team member that he didn't believe phone available at this location, nearest one 3 ct)* • *Active team to use vehicle, and travel via D Hdg travel road*

Appendix 14 QMRS Rescue Team Response Timeline

Time	Location - QMRS	**Action/activity**	**Key Decisions/comments**
			• *Can leave FAB uncoupled, monitor for gases* • *May have smoke at underpass at 20 c/t, will need to go under Oxygen* • *May need to brattice underpass to reduce smoke entering roadway* • *Fresh air expected at 33 c/t D hdg shaft* • *Still to get Authority to enter* • *Visibility may be reduced inbye 25 c/t*
08:01		• QMRS Acting Operations Manager calls to confirm that there are no active gas drainage systems, no ignition sources present underground	•
		• QMRS Trainer preparing Captains Tasks sheets, advises QMRS Acting Operations Manager transferring to memory stick for him to take to IMT and complete final up to date information prior to printing for team captains and deployment	•
08:04		• QMRS Trainer advises QMRS Acting Operations Manager that he will start mobilising teams and get to commence Captains preoperational checks	•
08:05		• QMRS Trainer updates team captains and advises to commence preoperational checks	•
08:08		• Teams carrying out preoperational checks of BG4's	• One team conducted High Pressure suit checks with BG4's on back? Not normally done this way.

Appendix 14 QMRS Rescue Team Response Timeline

Time	Location - QMRS	**Action/activity**	**Key Decisions/comments**
			• One team member observed losing significant amount of oxygen to atmosphere while suiting up as did not have BG4 mask ready to don. Result was that insufficient oxygen cylinder pressure was left to leave surface substation. • Identified by Team Captain and cylinder changed out. • One other Oxygen cylinder changed out due to less than 180 bar pressure.
08:25		• Transport vehicles x 3 brought up to Substation from Muster area/go line in preparation for FAB and two teams to go underground	•
		• FAB equipment being loaded into transport vehicle	•
		• All Team preoperational checks complete. Awaiting further instructions.	•
08:29		• Teams asked to load up into transport vehicles once it was identified vehicles were now available.	•
08:40		• Substation Coordinator receives update from QMRS Acting Operations Manager and requested to mobilise teams to muster area. • Two Teams and FAB Controller and assistant leave Substation in three vehicles and travel to muster area/go line	•

Appendix 14 QMRS Rescue Team Response Timeline

Time	Location - QMRS	**Action/activity**	**Key Decisions/comments**
	Muster Area	• Team members experienced delays while cap lamps, self-rescuers and personal tags sourced	• Sites to consider whose function it is to prepare this equipment to improve efficiency and timeliness i.e Logistics or Operations on instruction from Operations Controller? • Consider the ability for each site Mines Rescue Substation to have prepared Mines Rescue personal tags that can be used in a deployment or even in training and only require updating of name, lamp and scscr number?
		• Advised that waiting on final sign off of Authority to Enter	•
		•	•
		•	•
09:06		• Deputy Incident Controller requests teams to gather for briefing near lamproom and logistics rooms	• Mine was returning to normal operations which may have influenced decision to brief teams in this area. • Consider most suitable location for team briefings to convey relevant information and ensure it is fully understood. • Consider template for minimum information to be covered in briefing and preferred location e.g meeting room?
09:10	Outside Area between lamp	• Incident Controller, QMRS Acting Operations Manager brief teams.	• Captains Task sheet and Authority to enter provided to Team Captains

Appendix 14 QMRS Rescue Team Response Timeline

Time	Location - QMRS	**Action/activity**	**Key Decisions/comments**
	room and Engineering offices		• *Objective to locate and recover missing CMW* • *FAB location 10 c/t where a phone is available* • *Last known gas readings at upcast shaft and projected readings* • *Not to worry about installing brattice at 25 c/t underpass* • *For exercise purposes assume Firewatch being conducted by fire teams underground* • *Discussion regarding ability to use sites Wifi Mobile phones instead of running radio ribbon over a long distance. Agreed to source mobile phones for teams and FAB to take.* • *Request for more personal tags required as not all team members had them.*
09:16	Gas monitoring room	• OCN team member sourcing mobile phones and personal tags	•
09:26	Go Line	• FAB personnel leave to travel underground in one vehicle, followed by two teams in two vehicles	•
09:42	10 c/t D-C East Mains	• FAB vehicle and personnel arrive and park in c/t. Identify there is no phone at this location. FAB Controller called on Wifi mobile phone looking for QMRS Acting Operations Manager - IMT (number given incorrect) • Calls Comms Officer to confirm with IMT in	• Lack of communications at proposed FAB locations is a repeated issue during exercises. Either not available, or not working. • Wi-Fi phones have intermittent coverage,

Appendix 14 QMRS Rescue Team Response Timeline

Time	Location - QMRS	**Action/activity**	**Key Decisions/comments**
		absence of fixed telephone at 10 c/t C-D if ok to utilise Wifi phone on phone number 5739. • Receives confirmation ok to proceed	or potentially may not be functional at all if there is no underground power available, Wi-Fi coverage is poor, or not used by that specific mine site. • • Need to consider other alternatives/options and have a clear preference and redundancy plan so all equipment can be sourced, be available and ready to use to improve efficiency.
09:44		• Set up of FAB commenced	•
09:47		• Team 1 and Standbye Team Captain (Team 2) briefing teams	•
09:53		• Standbye team assisting with FAB setup. Gas monitoring tube run out inbye for FAB XAM environmental monitoring	•
09:55		• FAB assistant filling out QMRS Duty Card 4 • Team 1 put wheeled stretcher in transport vehicle (wheels off)	•
09:58		• Team 1 donning BG4's • Team 2 carrying out ventilation survey inbye FAB D hdg 10-11 c/t • FAB filling out gas monitoring and event log	•
10:03		• Team Captains 1 and 2 briefing FAB, confirming FAB operational and teams ok to proceed.	•
10:07		• Team 1 under oxygen, Vice-Captain carries out Captains checks on team members	• Head harness not thoroughly checked, not a full 10 seconds on slip test, observed on multiple team members

Appendix 14 QMRS Rescue Team Response Timeline

Time	Location - QMRS	**Action/activity**	**Key Decisions/comments**
10:11		• FAB talking to QMRS Acting Operations Manager. New phone number provided. Update FAB established, Team 1 preparing to deploy from FAB	•
10:12		• Team 1 Captain, provides team sheet, synchronises watch with FAB	•
10:14		• Team 1 leave FAB in transport, all with BG4 donned, Gas detector in front of vehicle with Captain. Stop to check Wi-Fi phone to FAB operational, some issues with phone signal.	• Level 1 assessor prompts that under QMRS guidelines teams can travel 30 mins off communications with FAB approval. • Confirm location of fixed phone and agree that Team 1 will make communications from this location within 30-minute time frame
		• FAB and Team 1 confirm will make communication from 35 A c/t B-C heading ERL phone within 30 minutes	•
10:18	10 c/t D heading East Mains	• Team 1 continue inbye in vehicle	•
10:20	13 c/t D heading East Mains	• Team identify 150 ppm Carbon Monoxide (CO) on gas detector. Vehicle stopped, Red cylume placed to demarcate point of interest, irrespirable atmosphere.	• Environmental Information provided by Level 1 assessor • Two-minute check was not completed thoroughly, (one team member prompted from rear of vehicle, but was not heard by Captain)
10:26	25 c/t D heading East Mains	• Team identify light smoke, visibility ok. CO 150 ppm. Vehicle stopped while task sheet checked then continued on.	•

Appendix 14 QMRS Rescue Team Response Timeline

Time	Location - QMRS	**Action/activity**	**Key Decisions/comments**
10:28	33 c/t D heading East mains	•	•
10:31	35A c/t B heading East Mains ERL	• Team arrives at last known location of missing CMW.	• L1 assessor takes place of missing CMW beside furthest ERS (Quickfill Station)
		• Two team members enter c/t and communicate with CMW • Identify CMW cannot walk, severe pain in abdomen • Team member communicates that they will need to change the CABA to Carevent prior to moving CMW.	• CMW is conscious and communicating, wearing CABA and is connected to ERS.
10:33		• Teams' vehicle has been turned around and is in B heading facing outbye, preparing to receive casualty on stretcher. • Wheeled stretcher is brought into c/t, wheels and handles are removed to assist in loading injured CMW. • Captain instructs team to change injured CMW to Carevent	• Minor delay while trying to fit Carevent to mask prior to putting on injured CMW. Prompt from L1 assessor to assist with aligning correctly while fitting demand head connection to mask
10:36		• Carevent is fitted to injured CMW	• L1 assessor prompted Team 1 Captain regarding Captains role in gathering environmental information, patient condition and communicating an update as soon as possible to FAB
10:38		• Team 1 Captain calls FAB from telephone in c/t	• Update commenced but connection was lost. Environmental readings not given to FAB

Appendix 14 QMRS Rescue Team Response Timeline

Time	Location - QMRS	**Action/activity**	**Key Decisions/comments**
10:40		• Injured CMW secondary survey completed and loaded into stretcher. • Wheels and handles put back on to remove casualty from c/t more easily	•
10:42		• Team 1 Captain attempts to call FAB to update, but no answer.	•
10:43		• Stretcher being loaded into rear of transport vehicle, wheels and handles off, utilising stretcher brackets in rear of vehicle. • Vice – Captain did a good job coordinating this.	• Due to design of the wheeled stretcher it did not comfortably fit into the stretcher brackets. It was still good enough to hold stretcher for transport out.
10:46		• Stretcher loaded and additional equipment	•
10:47		• Team 1 Captain does Captains suit pressure checks (average approx. 154 bar)	•
10:48		• Leave in vehicle to travel back to FAB	•
10:53	Travel out via D heading East Mains	• Injured CMW monitored on trip out, Oxygen check on Carevent cylinder carried out (50% full)	•
10:55	10 c/t D heading East Mains	• Arrive at FAB. • Team 1 Captain requests permission to come off Oxygen, carries out final suit pressure checks.	•
10:57		• Team 1 Captain carries out debrief to FAB Controller, provides information on Injured CMW condition	• Team 1 would have continued to surface with injured CMW in stretcher and handed over to medical personnel.
11:00		• FAB call Substation Coordinator and provide update.	• End of Mines Rescue exercise called by Level 1 assessors.

The following are direct excerpts from the assessors notes, text in green and red indicates high priority actions undertaken.

Underground Observers **- DSEM Development Joel Treasure Carl Skinner (Patient Ankle Injury)**

- *This is an emergency exercise that you have already been informed about.*
- *Please treat this exercise as a real event.*
- *I am the observer for this event*
- ***Do not put your belt worn self-rescuer on. You will be given one if required.***
- **Start communication with:**

"This is a Level 1 exercise communication"

- *You are free to make your own decisions.*
- *You are not to endanger your own or any other persons safety in this exercise.*
- *I will give instructions/information with regard to the environment.*
- *I may ask you to perform activities as part of the exercise test*
- *As I am an observer I am not allowed to assist you by answering questions.*
- Engage with the site personnel until T=0 general discussions about objectives and learnings of level 1 exercises.

Ankle injury occurs to CMW at panel crib room when walking to drifty provide information sign

Consider

- What information is received from the CRO regarding the fire.
- What communication is provided to the CRO from CMWs.
- Where and when do CMWs decide to refill CABA. Do they know how to access CABA from adjacent headings.
- Does the ERZC effectively account for all CMWs in their district.
- Is communication to the surface consistent during self-escape, what information is exchange with CRO.

ALL SCSR, CABA AND PARTS TO BE REMIOVED FROM THE MINE AND PLACED IN PROVIDED BINS ON SURFACE

If CMWs decide to fill CABA at ERLs discuss with CMWs how they would access and note decision. All CMWs with CABA will refill at 33ct training refill unit.

Shift times

NS 25-26/10/2021
Start 2000hrs Finish 0700hrs

DS Process crew 26/10/2021

Start 0600hrs Finish 1800hrs

AS Production 26/10/2021

Start 1200hrs Finish 2200hrs

Scenario Brief

- 2x LHD collide Tuesday 0100hrs East Mains B Heading 12ct (1 LHD carrying diesel fuel pod)
- 2x Drivers injured
- O110hrs Fire develops on LHD quickly accelerating.
- Outbye personnel can respond to Injured CMW and fire (all night shift personnel out by end of shift)
- Oncoming Bullgang shift (0400hrs start) may take over fire fighting activities
- Inbye personnel have to self escape
- All headings In East Mains filled with thick smoke outbye EM downcast shaft 33ct preventing safe egress
- Escape available via A hdg flanking return

Self-escape Initiation

- Show the contaminate signs as per times
- 8 persons to don SCSR and CABA (**Ensure all SCSR and CABA parts come to surface in driftys)**
- Withdrawal by vehicle if available. **If we have to leave CMWs in the panel due to lack of transport contact MW to organise**.
- A CMW from the crew with ankle injury (requires assistance to walk to Drifty and self-escape) Provide sign to patient

Secure continuous miner ensure there is no support issues:

CABA Refill access

- DSEM CABA refill is in the primary escapeway D heading at 23ct and 10ct. These refills are accessible in this stage of the Self Escape
- East Mains 52 – 33ct CABA refills are in the primary escapeway B Heading 46ct and 35a ct. Accessible from D heading
- EM 33ct to 3ct CABA refills are at 22ct and 13ct. Accessible directly behind VCD in A – Bct

Note: No permanent refill station is to be used. A training refill station will be installed at EM 33ct for all CMWs using CABA to demonstrate the process prior to entering the return.

When escaping out A heading 33ct – 3ct Note if CMWs intended to refill again at 22ct and 13ct.

East Mains 52ct

- Tape and a picture of thick smoke (zero visibility) will be across 52ct underpass which is the primary egress.
- D heading outbye 52ct is fresh air and clear
- If the ERZC/Group decide to continue via primary escapeway note decision but direct up D heading.

East Mains 33ct

- D 33 fresh air splits across 33ct underpass mixing with incoming smoke. Visibility 20-30m
- Intakes outbye 33ct D – B thick smoke to unsafe to Egress (zero visibility, tape and photos will be in place).
- **E heading return deemed to unsafe to travel. If chosen by CMWs note decision and state 'door is stuck fast'**
- A heading return accessible at 33ct and only accessible egress until fire under control (visibility 20 -30m). Exit 3ct
- **Where CMWs escape via return they MUST HAVE AN OCN ERZC WITH THEM. If no ERZC with group wait a reasonable time until an ERZC arrives**
- At 33ct crew will need to decide what to do with patient – **Patient has severe ankle pain unable to walk**
- **If ERZC/Crew decide to leave Patient in fresh air with other CMWs they can travel outbye with drifty and quarantine with drifty until 0600hrs and travel to surface**
- 1 crew member will take Drifity to EM D heading 1 – 4ct and will be quarantined until 0600hrs).
- CMWs who escape via A heading exiting 3ct

At 0300hrs all Comms in D heading fresh air will be lost to surface

Outbye fire site East Mains

- CMWs may choose to assist with firefighting activities.
- Until 0600hrs all escaping CMWs can only be transported to the surface via available outbye Driftys and personal.
- At 0060hrs Quarantined driftys can take all remaining CMWs to The Surface
- On arrival to the surface these driftys will be quarantined on the surface for the duration of the exercise. Please place provided tags on drifty steering wheels

Surface

- All self-escaping CMWs who remained in fresh air underground will report to Michelle Brunker at the tag Board.
- Michelle will record their names for accounting and their tags will be left on the tag board.

- Their lamps and rescuers will be placed in a designated area not back in racks.

NS CMWs depart site at 0700hrs

Your Bus departs at 0830hrs.

Surface observers

- *This is an emergency exercise that you have already been informed about.*
- *Please treat this exercise as a real event.*
- *I am the observer for this group.*
- **Start communication with Level 1 exercise communication**
- ***Do not ring 000 or any external services***
- ***Please tell me if you would have contacted an external service as part of your response/Duty card***
- ***You are free to call QMRS, Inspectorate, ISHR, Simtars or Glencore personnel as required***
- *You are free to make your own decisions.*
- *You are not to endanger your own or any other persons safety in this exercise.*
- *As I am an observer I am not allowed to assist you by answering questions.*
- Engage with the site personnel until T=0 general discussions about objectives and learnings of level 1 exercises

Points to Consider

- Accuracy of information received by IMT
- The Objective and supporting strategies.
- Was a Risked base process applied to determine the risk of the hazard to responders e.g., the potential of an ignition source contacting a flammable atmosphere.
- Are Critical decisions risked based, how are the recorded and communicated.
- Control of information e.g status and location of people, resources availability, actions register.
- Do functional areas clearly understand the Objective and strategies.
- Are they adequately resourced
- Are actions document, including evidence of completion
- How effective is communication of critical information from functional area to IMT (even when IMT not meeting). Particularly from underground
- Do people understand their role and the ER System

Shift times

NS 25-26/10/2021

Start 2000hrs Finish 0700hrs

DS Process crew 26/10/2021

Start 0600hrs Finish 1800hrs

AS Production 26/10/2021

Start 1200hrs Finish 2200hrs

Scenario Brief

- 2x LHD collide Tuesday 0100hrs East Mains B Heading 12ct (1 LHD carrying diesel fuel pod)

- 2x Drivers injured
- O110hrs Fire develops on LHD quickly accelerating.
- Outbye personnel can respond to Injured CMW and fire (all night shift personnel out by end of shift)
- Oncoming Bullgang shift (0400hrs start) may take over fire fighting activities
- Inbye personnel have to self escape
- All headings In East Mains filled with thick smoke outbye EM downcast shaft 33ct preventing safe egress
- Escape available via A hdg flanking return

Approximately 0030hrs CRO will receive a call from LHD operator stating Inbye side of overcast at East Mains 14ct has been damaged, door missing and hole caused by LHD
This will be cause of smoke entering belt road

Self-Escape

- LW704, Dev MG705, DSEM and Outbye will have varying gas/smoke concentrations
- Each Panel will have 8 Training SCSR/CABA outbye will have 6 to use
- All self escape from panels expected to be by Drifty.
- East Mains 52ct underpass Crews encounter thick Smoke (zero visibility) to unsafe to egress
- East Mains D heading 52ct – 33ct Fresh air (supplied by 38ct downcast shaft)
- 2 CMWs escaping from panels will be incapacitated starting at crib rooms
    - **P1 (MG 705 DEV) Symptoms Difficult to walk. Patient has dizziness, shortness of breath, Significant fatigue, Abdominal pain**
    - **P2 Patient DSEM Dev has severe ankle pain unable to walk**

CABA Refill access

- DSEM CABA refill is in the primary escapeway D heading at 23ct and 10ct. These refills are accessible in this stage of the Self Escape
- East Mains 52 – 33ct CABA refills are in the primary escapeway B Heading 46ct and 35a ct. Accessible from D heading
- EM 33ct to 3ct CABA refills are at 22ct and 13ct. Accessible directly behind VCD in A – Bct

Note: No permanent refill station is to be used. A training refill station will be installed at EM 33ct for all CMWs using CABA to demonstrate the process prior to entering the return. When escaping out A heading 33ct – 3ct Note if CMWs intended to refill again at 22ct and 13ct.

East Mains 52ct

- Tape and a picture of thick smoke (zero visibility) will be across 52ct underpass which is the primary egress.
- D heading outbye 52ct is fresh air and clear
- If the ERZC/Group decide to continue via primary escapeway note decision but direct up D heading.

East Mains 33ct

- D 33 fresh air splits across 33ct underpass mixing with incoming smoke. Visibility 20-30m
- Intakes outbye 33ct D – B thick smoke to unsafe to Egress (zero visibility, tape and photos will be in place).
- **E heading return deemed to unsafe to travel. If chosen by CMWs note decision and state 'door is stuck fast'**
- A heading return accessible at 33ct and only accessible egress until fire under control (visibility 20 -30m). Exit 3ct
- **Where CMWs escape via return they MUST HAVE AN OCN ERZC WITH THEM. If no ERZC with group wait a reasonable time until an ERZC arrives**

- At 33ct crews will need to decide what to do with patients –
- **If ERZC/Crew decide to leave Patient in fresh air with other CMWs they can travel outbye with drifty and quarantine with drifty**
- 1 crew member will take Drifity to SEM D heading 8ct and will be quarantined until 0600hrs).
- CMWs who escape via A heading exiting 3ct

Note: there will be no communications with people remaining in fresh air from surface. IMT will only have the details of their condition and location provided by Escapees comms will be lost at 0300hrs

Outbye fire site East Mains

- CMWs may choose to assist with firefighting activities.
- Until 0600hrs all escaping CMWs can only be transported to the surface via available outbye Driftys and personal.
- At 00600hrs Quarantined driftys can take all remaining CMWs to The Surface
- On arrival to the surface these driftys will be quarantined on the surface for the duration of the exercise. Please place provided tags on drifty steering wheels
- **Surface**
- All self-escaping CMWs who remained in fresh air underground will report to Michelle Brunker at the tag Board.
- Michelle will record their names for accounting and their tags will be left on the tag board.
- Their lamps and rescuers will be placed in a designated area not back in racks.

First Response Fire

- Fire will take up quickly both LHD and diesel pod
- Fire will take up in coal ribs
- Response likely to come from outbye
- Self escapees may conduct FF on exit from 3ct.
- A response will also be required by Bullgang crew to relieve NS FF team.
- Hand held Extinguishers will be insufficient.
- Low ex foam when used will have Fire and smoke push back Fire team
- Turbex™ foam Generator available in fire depot 8ct EM this will need to be applied to bring fire under control.
- When Turbex™ effectively applied it can be turned off

Aided Escape

- **Where the turbex is effectively applied the fire intensity will decrease and be effectively controlled at 0700hrs.**
- However Gas Monitoring will still indicate contaminates significantly above legislated requirements.
- Because no communication is available with CMWs remaining inbye QMRS should be deployed to aid escape.
- If QMRS are deployed from FAB prior to 1100hrs they will be allowed to travel to D 38ct shaft
- If After 1100hrs they will be told (approx. 200m from FAB) a vehicle is travelling heading and can returfn to FAB with CMWS

NS CMWs depart site at 0700hrs

Surface assessors Bus departs at 1230hrs.