

## **Consolidated report**

Fire or explosion – explosion suppression – coal mines  
below surface

**January 2024 to June 2024**



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# Table of Contents

Executive summary .....	4
Assessment controls and criteria questions .....	5
Assessment findings.....	5
Assessment ratings.....	6
Compliance notices issued .....	8
Recommendations for underground coal mines.....	8
Further information .....	9
Appendix A – Assessment criteria rating.....	10

# Executive summary

A crucial part of the Resources Regulator's incident prevention strategy for mines and petroleum sites involves:

- targeted assessments and planned inspection programs – focusing on assessing an operation's control of critical risks by evaluating the effectiveness of control measures in the mine's safety management system
- priority programs – proactively assessing a topic that is an emerging risk throughout the industry, which is determined primarily from incident data as well as evolving industry trends. Although these topics may also be contained within the Regulator's planned inspection programs, the aim of compliance priority programs is to gather further information and knowledge about how the industry is managing and controlling a specific issue.

The Regulator has developed a bowtie hazard management framework and standardised assessment checklist for each program plan. Under each program plan, the effectiveness of the safety management system at each mine site is assessed against a standard set of control supports and critical controls.

The controls to manage the risk of fire or explosion at underground coal mines includes explosion suppression systems. The control supports and criteria are identified in the Regulator's explosion suppression bowtie.

Fire and explosions at underground coal mines have the potential to cause serious and/or fatal injuries to workers if not controlled effectively.

This report will consolidate assessment findings and provide analysis and recommendations for operators of underground coal mines.

An inspection assessment program was developed to assess how well underground coal mines are prepared to manage risks. In total there were 63 assessments conducted at 24 underground coal mines. The majority of underground coal mines were assessed multiple times. There were 4 coal mines assessed on 4 different inspections during the first 6 months of 2024.

In summary, there were 441 individual assessment findings and of those 22 assessment findings related to the management of explosion suppression systems that required enforcement action by compliance notice to be taken at the underground coal mine.

The assessment program was conducted between January 2024 and June 2024.

In summary, there were 25 compliance notices issued in total to 12 underground coal mines, comprising of:

- 8 x section 191 improvement notices issued to 4 underground coal mines. All 8 section 191 notices concerned explosion suppression issues
- 17 x section 23 cause for concern notices issued to 11 underground coal mines. 14 of the 17 section 23 notices concerned explosion suppression issues
- Several mines were issued with multiple notices

Explanatory notes on the assessment system are listed in Appendix A

# Assessment controls and criteria questions

Critical control supports were identified by the Regulator and assessment criteria were assigned to each potential threat.

A tabulation of the control support and criteria for the assessment of explosion suppression systems at underground coal mines is provided in Table 1.

Table 1. Control supports and criteria for the assessment of explosion suppression systems at underground coal mines

Control	Control support	Criteria
MC1.2	01	Stone dust is applied at the rates and in the methods specified in the procedures. Reference <i>WHS(MPS) Regulation 2022</i> sections 65(1)(d) including 68(1)(c)(i)(ii)(iii)(iv) and 68(1)(h)(i)(ii)
	02	Roadway dust samples are taken from the areas specified and analysed at the specified frequencies
	03	Float dust is managed within the mine. Reference <i>WHS(MPS) Regulation 2022</i> Sections 68(3)(h)
	04	Identified substandard incombustible content levels are rectified within the specified time frames
	05	Explosion barriers are installed at locations documented in the mine safety management system
	06	Explosion barriers are inspected to confirm they comply with the standard outlined by the installation instructions
	07	Explosion barriers comply with the standard outlined in the installation instructions

## Assessment findings

In summary the assessment criteria findings were:

- 441 individual findings
- 22 finding with enforcement action by compliance notice
- 25 compliance notices issued in total to 12 underground coal mines, comprising of:
  - 8 x section 191 improvement notices issued to 4 underground coal mines. All 8 section 191 notices concerned explosion suppression issues
  - 17 x section 23 cause for concern notices issued to 11 underground coal mines. 14 of the 17 section 23 notices concerned explosion suppression issues
  - several mines were issued multiple notices

The overall assessment finding for the explosion suppression control support criteria is 94%.

- the lowest ranked finding of 77% was criteria 07 – explosion barriers comply with the standard outlined in the installation instructions
- the two highest ranked finding of 100% was criteria 04 - identified substandard incombustible content levels are rectified within the specified time frames and criteria 06 – explosion barriers are inspected to confirm they comply with the standard outlined by the installation instructions.

Figure 1 provides the overall assessment findings for each criteria question.

Figure 1. Summary assessment findings overall results by control support

MC 1.2 - Explosion suppression							Grand Total
01	02	03	04	05	06	07	
Stone dust is applied at the rates and in the methods specified in the procedures 68(1)(d) including 68(1)(c)(i)(ii)(iii)(iv) and 68(1)(h)(i)(ii)	Roadway dust samples are taken from the areas specified and analysed at the specified frequencies.	Float dust is managed within the mine 68(3)(h)	Identified substandard incombustible content levels are rectified within the specified time frames.	Explosion barriers are installed at locations documented in the mine safety management system.	Explosion barriers are inspected to confirm they comply with the standard outlined by the installation instructions.	Explosion barriers comply with the standard outlined in the installation instructions.	
86%	99%	95%	100%	99%	100%	77%	94%

- Green (=100%)
- Yellow (>= 80% and <100%)
- Orange (>= 65% and <80%)
- Red (<65%)
- Not applicable

## Assessment ratings

The overall assessment finding ratings were:

- 91% rating of documented and implemented
- 8% rating of documented but not implemented
- 0% rating of not documented and not implemented
- 1% rating of not applicable

Figure 2 provides a summary of the overall assessment findings ratings.

Figure 2. Overall assessment findings ratings

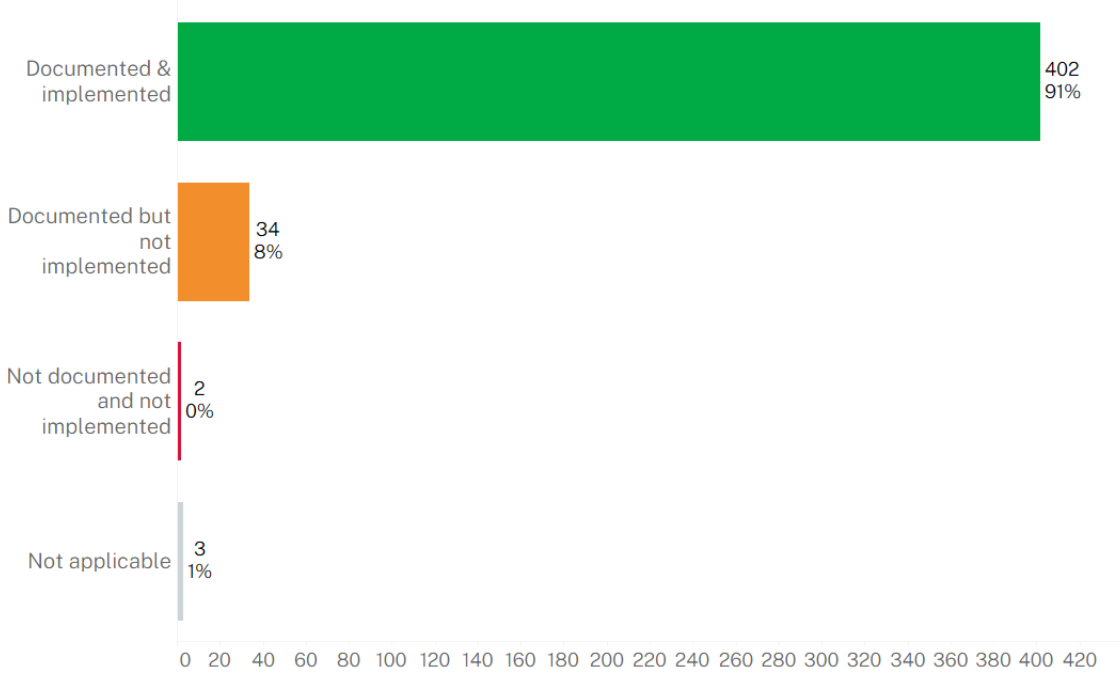


Figure 3 provides a summary of the overall assessment findings ratings by control support.

Figure 3. Overall assessment findings ratings by control support



# Compliance notices issued

In summary, there were 25 compliance notices issued in total to 12 underground coal mines, comprising of:

- 8 x section 191 improvement notices issued to 4 underground coal mines. All 8 section 191 notices concerned explosion suppression issues
- 17 x section 23 cause for concern notices issued to 11 underground coal mines. 14 of the 17 section 23 notices concerned explosion suppression issues
- Several mines were issued with multiple notices

Table 2 details all compliance notices issued by type and number to underground coal mines during the program.

Table 2: WHSA compliance notices issued by type and number for underground coal mines

NOTICE TYPE	TOTAL ISSUED	NUMBER OF MINES
s.191 improvement notice	8	4
s.23 notice of concern	17	11
<b>Total</b>	<b>25</b>	<b>12</b>

**Note: some mine sites were issued multiple notices**

**Note:** Some compliance notices issued concerned items not directly related to the assessment topic. Some notices issued covered more than one topic.

# Recommendations for underground coal mines

Based on the findings outlined in this report and with respect to the numbers and types of compliance notices issued during the assessment of explosion suppression systems at underground coal mines, it is recommended that the following issues should be reviewed by operators of underground coal mines:

- Stone dust is applied at the rates and in the methods specified in mine procedures including review of legislative requirements detailed in:
  - WHS(MPS) Regulation 2022 Section 68 coal dust explosion
  - WHS(MPS) Regulation 2022 Schedule 1 PHMP: Part 2 Mines and Petroleum sites: Section 9 Fire or explosion
- Treatment of float dust on structures and surfaces that have been dusted with stone dust is managed in roadways of underground coal mines including review of legislative requirements detailed in:
  - WHS(MPS) Regulation 2022 Section 68(3)(h)
- Explosion barriers comply with the standards specified in mine procedures including review of the legislative requirements detailed in:
  - WHS(MPS) Regulation 2022 Section 68 Coal Dust Explosion



- WHS(MPS) Regulation 2022 Schedule 5: Water barriers in underground coal mines
- Review the mine coal dust explosion control plan (CDECP) with the July 2024 published technical reference guide (TRG) which applies to all underground coal operations in NSW and replaces MDG-3006-MTR5 Guideline for coal dust explosion prevention and suppression.

The TRG provides mine operators with guidance on developing and documenting a CDECP.

Mine operators must develop CDECPs as per section 19 (2) (c) (iv) of the WHS (MPS) Regulation 2022.

The TRG does not affect a mine operator’s obligations to comply with the stone dusting requirements in section 68 of the WHS(MPS) Regulation 2022.

The Regulator’s published TRG can be found at:

[www.resourcesregulator.nsw.gov.au/sites/default/files/2024-07/trg-coal-dust-explosion-suppression-and-prevention.pdf](http://www.resourcesregulator.nsw.gov.au/sites/default/files/2024-07/trg-coal-dust-explosion-suppression-and-prevention.pdf)

## Further information

For more information on safety assessment programs, the findings outlined in this report, or other mine safety information, please contact the Resources Regulator:

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Email	<a href="mailto:cau@regional.nsw.gov.au">cau@regional.nsw.gov.au</a>
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Website	<a href="http://www.resourcesregulator.nsw.gov.au">www.resourcesregulator.nsw.gov.au</a>
Address	Resources Regulator 516 High Street Maitland NSW 2320

# Appendix A – Assessment criteria rating

Each assessed criteria is rated from one to 4 based on evidence supporting the expected control supports identified at the mine site.

Evidence supporting expected control supports

Expected control supports	Rating	Evidence supporting rating / comments				
	<table border="1"> <tr> <td>4</td> <td>3</td> </tr> <tr> <td>2</td> <td>1</td> </tr> </table>	4	3	2	1	
4	3					
2	1					

Assessment findings results are calculated based on the total points allocated to the assessed ratings as a percentage of the maximum possible points for each criteria group, and any findings rated as ‘Not applicable’ were excluded from the calculation.

Criteria assessed ratings and points

Assessed as	Rating	Points
Documented & implemented <b>Compliant</b>	4	4
Implemented but not documented <b>Improvement needed</b>	3	2
Documented but not implemented <b>Significant improvement needed</b>	2	1
Not documented and not implemented <b>Non compliant</b>	1	0
Not applicable (N/A)		

Findings results (points) with colours assigned as follows:

- Green (=100%)
- Yellow (>= 80% and <100%)
- Orange (>= 65% and <80%)
- Red (<65%)
- Not applicable