

Compliance priority report

Air quality – ventilate workplace

Metalliferous underground mines

July 2023 to October 2023



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Table of Contents

Executive summary	4
Assessment criteria.....	4
Findings.....	5
Notices issued.....	7
Recommendations	8
Further information	9
Appendix A – Assessment criteria rating.....	10

Executive summary

A crucial part of the NSW Resources Regulator’s Incident prevention strategy involves compliance priority programs for mines and petroleum sites. This involves proactively assessing a topic that is an emerging risk across the industry, predominantly determined from incident data or other 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 an issue which may not be related to a specific principal hazard.

This particular program was initiated to review how operators of underground metalliferous mines were responding to the management of the principal hazard management plan dealing with compliance with air quality, dust and other airborne contaminants in underground metalliferous mine sites.

This report summarises the assessment findings from the compliance priority program which targeted mine operator’s management of air quality, dust and other airborne contaminants in sixteen underground metalliferous sites during the period from July 2023 to October 2023 at:

- 16 underground metalliferous mines

Assessment criteria

Several key elements (referred to as criteria) were assessed as part of this program and included:

Table 1. Compliance Priority Program Criteria

Criteria number	Criteria
1	What airborne contaminants have been identified?
2	Have airborne exceedances been identified through personal/static monitoring? What actions have been taken?
3	What ventilation controls have been identified and implemented to manage heat?
4	What is the mine standard for distance of the vent bag from the working face?
5	Is ventilation adequate for the number of mobile plant working on a level or mining area?
6	Talk with a person who completes ventilation control inspections and maintenance to verify their knowledge of the control performance requirements.
7	Validate a recently completed inspection of a ventilation control in the field.
8	The implemented ventilation control operates as designed.
9	Workers can explain the airborne contaminant hazards in their workplace, the health impacts of exposure to those hazards, the ventilation controls and action required of them when controls are ineffective.

Criteria number	Criteria
10	Can workers explain the controls to manage heat? When are heat readings taken? Do workers know the mines TARP for heat management or withdrawal triggers/temperatures?
11	Workers can explain ineffective ventilation controls are rectified in a timely manner.
12	Confirm competence of shift supervisor to complete ventilation checks.
13	Other issues identified during the Inspection.

Findings

Overall, the findings were:

- 16 site assessments reviewed for this report
- 208 individual findings
- 49 notices issued under the program

The overall assessment compliance % rating (refer Figure 1) for the 13 assessed criteria ranged from:

- Question 5 findings were assessed at 44% compliance (lowest compliance finding)
- Questions 2 and 7 findings were assessed at 95% compliance (highest compliance finding)

Two assessed criteria questions assessed rated in the ‘red colour category’ less than 65% compliance:

- Question 5 assessed at 44%: Is ventilation adequate for the number of mobile plant working on a level or mining area?
- Questions 12 assessed at 56%: Confirm competence of shift supervisor to complete ventilation checks.

Two assessed criteria questions assessed rating in the ‘orange colour category’ greater or equal to 65% compliance and less than 80% compliance:

- Question 3 assessed at 78%: What ventilation controls have been identified and implemented to manage heat?
- Question 6 assessed at 80%: Talk with a person who completes ventilation control inspections and maintenance to verify their knowledge of the control performance requirements.

The assessment compliance % rating for each assessed criteria is summarised in Figure 1:

Figure 1. Summary assessment findings overall results by element

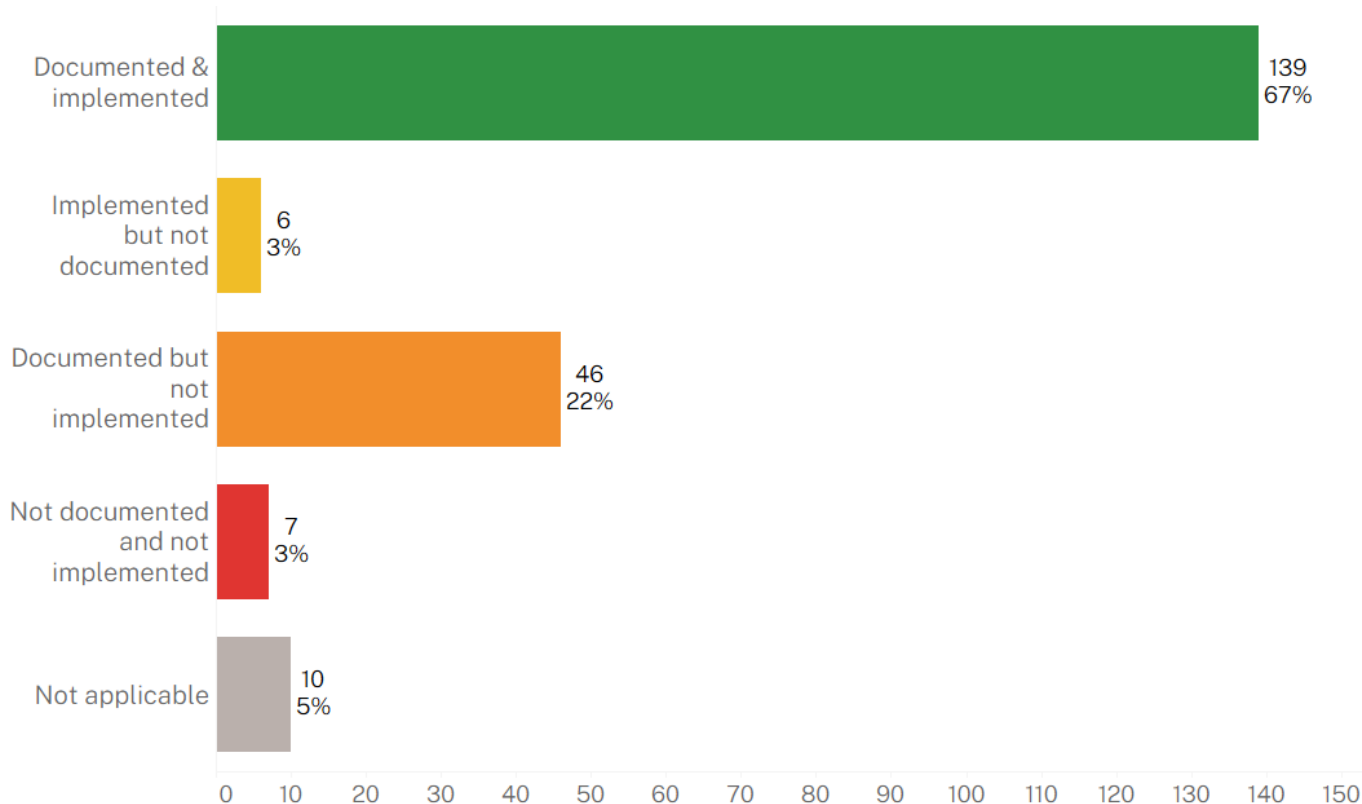
01	What airborne contaminants have been identified.	92%
02	Have airborne exceedances been identified through personal/static monitoring? What actions have been taken?	95%
03	What ventilation controls have been identified and implemented to manage heat?	78%
04	What is the mine standard for distance of the vent bag from the working face.	81%
05	Is ventilation adequate for the number of mobile plant working on a level or mining area?	44%
06	Talk with a person who completes ventilation control inspections and maintenance to verify their knowledge of the control performance requirements.	80%
07	Validate a recently completed inspection of a ventilation control in the field.	95%
08	The implemented ventilation control operates as designed.	88%
09	Workers can explain the airborne contaminant hazards in their workplace, the health impacts of exposure to those hazards, the ventilation controls and action required of them when controls are ineffective.	91%
10	Workers can explain the controls to manage heat? When are heat reading taken? Do workers know the mines TARP for heat management or withdrawal triggers/temperatures?	86%
11	Workers can explain ineffective ventilation controls are rectified in a timely manner.	85%
12	Confirm competence of Shift supervisor to complete ventilation checks.	56%
13	other issues identified during the Inspection	29%
Grand Total		78%

- Green (=100%)
- Yellow (>= 80% and <100%)
- Orange (>= 65% and <80%)
- Red (<65%)

The overall analysis of assessment findings ratings were found to be documented and implemented assessed at 67%. Implemented but not documented assessed at 3%. Documented but not implemented at 22%. The category not documented and not implemented was found to be 3%.

The analysis of the assessed criteria documentation and implementation is summarised in Figure 2:

Figure 2. Overall assessment findings ratings



Notices issued

Of the **16** sites assessed under the inspection program, **14** separate mines were given **49** notices relating to compliance with air quality and ventilate workplace, some mine received multiple notices related to the program.

The notices issued were examined in detail and Table 2 below lists the notices issued by type.

Table 2: Notices issued for the planned inspection program – pressure vessels

NOTICE TYPE	TOTAL ISSUED	NUMBER OF MINES
s.23 notice of concerns	13	13
s.191 improvement notice	21	13
s. 195 prohibition notices	15	7
Total	49	14

Note: some mines were issued multiple notices

Of the combined **49** notices issued associated with compliance with air quality and ventilate workplace, there were some common themes that were apparent throughout the program plan.

- Inadequate monitoring and management of diesel particulate matter (DPM) in mining areas and issue with the measurement of air volume to determine the number of diesel engines permitted to operate,
- The monitoring and management of respirable dust, crystalline silica, other airborne contaminants and excess heat in development drives.
- Issues with re-entry to development drives after shot firing had been completed.
- Excessive and non-compliant distances of ventilation ducting from the working face, providing inadequate dilution of airborne contaminants,
- Issue with supervisor and operator knowledge and compliance with monitoring air quality, heat stress and ventilation standards in mine workings

Recommendations

Based on the findings outlined in the report identifying the compliance ratings for each assessed criteria for compliance with the principal hazard management plan dealing with air quality, dust and other airborne contaminants in underground metalliferous mine sites and the significant number of compliance notices issued during the program.

Mine operators should consider the following recommendations:

- Review the adequacy of site ventilation control plan and worker health control plan to ensure diesel particulate matter (DPM), respirable dust, crystalline silica, other airborne contaminants, and excess heat are adequately managed as per legislative requirements, With reference to:
 - WHS(MPS)Reg 2022 Division 3: Specific control measures for all mines and petroleum sites:
-Subdivision 2: Air quality and monitoring.
 - WHS(MPS)Reg 2022 Division 5: Specific controls for underground mines
-Subdivision 2: Air quality and ventilation for underground mines
 - WHS(MPS)Reg 2022 Division 6: Other specific control measures
- Review the site ventilation control plan to manage safe re-entry to workplaces after shot firing has been completed.
- Review the adequacy of supervisor and worker training and verification of competency against the site ventilation control plan.
- Review the adequacy of the worker health control plan. With reference to:
 - WHS(MPS)Reg 2022 Part 4: Health monitoring
 - WHS(MPS)Reg 2022 Schedule 2: Principal control plans - 1. Health control plan

Further information

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

Contact type	Contact details
Email	cau@regional.nsw.gov.au
Incident reporting	To report an incident or injury call 1300 814 609 or log in to the Regulator Portal
Website	www.resourcesregulator.nsw.gov.au
Address	NSW Resources Regulator 516 High Street Maitland NSW 2320

Appendix A – Assessment criteria rating

Each assessed criteria is rated from 1 through 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 style="background-color: #008000; color: white;">4</td> <td style="background-color: #ffff00; color: black;">3</td> </tr> <tr> <td style="background-color: #ffa500; color: black;">2</td> <td style="background-color: #ff0000; color: white;">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	4	4
Implemented but not documented	3	2
Documented but not implemented	2	1
Not documented and not implemented	1	0
Not applicable		

Findings results (points) with colours assigned as follows:

- Green (=100%)
- Yellow (>= 80% and <100%)
- Orange (>= 65% and <80%)
- Red (<65%)