

CANDIDATE NUMBER:	(write in from your letter)
EXAMINATION: mines	Mining engineering manager of underground coal
EXAM PAPER:	MB1 – Legislation
DATE:	Thursday 2 <sup>nd</sup> March 2023

# EXAMINATION BOOKLET

#### CANDIDATE NUMBER:

(write in from your letter)

Questio	n Number	Mark	Available mark	<b>Marked by</b> Name	Summary comments to justify, as necessary
	a		3		
	b		3		
1	с		2		
	d		4		
	e		8		
	Subtotal		20		
2	а		20		
	Subtotal		20		
	a		3		
	b		5		
	с		2		
3	d		4		
	e		1		
	f		1		
	g		4		
	Subtotal		20		
4	a		10		
-	b		10		

Question Number		Mark	Available mark	<b>Marked by</b> Name	Summary comments to justify, as necessary
	Subtotal		20		
	а		14		
5	b		3		
	с		3		
	Subtotal		20		
PAPER	TOTAL		100		Marks checked by:



(MB1)

Work Health and Safety (Mines and Petroleum Sites) Act 2013 Work Health and Safety (Mines and Petroleum Sites) Regulation 2022

#### EXAMINATION FOR CERTIFICATE OF COMPETENCE Mining engineering manager of underground coal mines

## **Mining Legislation Paper**

Thursday 2<sup>nd</sup> March 2023 10:50am to 12:00pm (60 minutes)

Venue: Tocal College, Paterson NSW 2421

Room: Glendarra (2) Conference Room

### **INSTRUCTIONS TO CANDIDATES**

All five (5) questions are to be attempted.

All questions are of equal value - 20 marks each

10 minutes reading time is allowed prior to the start of the examination

Unless otherwise stated all references to Act and Regulations are to the

Work Health and Safety Act 2011 Work Health and Safety Regulation 2017 Work Health and Safety (Mines and Petroleum Sites) Act 2013 Work Health and Safety (Mines and Petroleum Sites) Regulation 2022 Explosives Act 2003 Explosives Regulation 2013

# ANSWER BOOKLET

- A HIGHLIGHTER ONLY (no pen/pencil etc) can be used in this part of the exam paper during reading time
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Mining engineering manager of underground coal mines – MB1 Legislation – March 2023
Question 1 (total 20 marks)
Notifiable Incidents
a) Under S14 of the WHS MPS Act 2013 what does a Notifiable incident mean? (3 marks)
b) What is the duty to notify under s15 WHS MPS Act when you have a notifiable incident?
(3 marks)
c) S16 of WHS MPS Act requires additional action for a notifiable at a coal mine. What are
these requirements and what detail must be provided? (2 marks)
d) What are the requirements under s17 WHS MPS Act to preserve the scene and when
can it be disturbed? (4 marks)

Mining engineering manager of underground coal mines - MB1 Legislation - March 2023

e) S16 WHS MPS Regs states what is required to be recorded following a notifiable incident? Briefly outline the requirement. (8 marks)

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#### Question 2 (total 20 marks)

SMS

What are the contents of the SMS as per s15 of the WHS MPS Regs?

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Mining engineering	manager of	underground	coal mines - MR1	Legislation -	March 2023
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#### Question 3 (total 20 marks)

Notices

a) Under s191 of WHS Act for what purposes can an improvement notice be issued? (3 marks)

b) What must a s191 notice contain? (5 marks)

c) S194 allows for the extension of the compliance date. At what stage can this not be done by an inspector? (2 marks)

S223 states the issuing of a s191 notice is a reviewable decision.

a) Who can request the review? (4 marks)

	Mining engineering manager of underground coal mines – MB1 Legislation – March 2023
e)	What is the timeframe for requesting a review? (1 mark)
f)	What timeframe does the regulator have to complete the review? (1 mark)
g)	What else must be completed when you receive a s191 notice? (4 marks)
Quest	tion 4 (total 20 marks)
Statut	ory obligation
	WILE Ast primary duty of care . What are the requirements? (10 merks)
a) 519	who Act primary duty of care. what are the requirements? (10 marks)
	Page 10 of 14

b) WHS MPS regs Schedule 10 states stat function. List the requirements for MEM, VO and OCE? (10 marks)		11011 2023
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N.4:.	ing engineering menoper of underground each minee. MD4 Legislation Merch 2002	
IVIII	ling engineering manager of underground coal mines – MB1 Legislation – March 2023	
c) What	matters MUST be addressed following consultation? (3 marks)	
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CANDIDATE NUMBER:	(write in from your letter)
EXAMINATION: mines	Mining engineering manager of underground coal
EXAM PAPER:	MB2 – Mine Ventilation
DATE:	Thursday 2 <sup>nd</sup> March 2023

# EXAMINATION BOOKLET

#### CANDIDATE NUMBER:

(write in from your letter)

Question Number		Mark	Available mark	<b>Marked by</b> Name	Summary comments to justify, as necessary
	а		40		
1	b		40		
	с		20		
	Subtotal		100		
2	а		20		
	b i)		50		
	b ii)		10		
	с		10		
	d		10		
	Subtotal		100		
PAPER	TOTAL		200		Marks checked by:



(MB1)

Work Health and Safety (Mines and Petroleum Sites) Act 2013 Work Health and Safety (Mines and Petroleum Sites) Regulation 2022

#### **EXAMINATION FOR CERTIFICATE OF COMPETENCE** Mining engineering manager of underground coal mines

## **Mine Ventilation Paper**

Thursday 2<sup>nd</sup> March 2023 12:50pm to 4:00pm (190 minutes)

Venue: Tocal College, Paterson NSW 2421

Room: Glendarra (2) Conference Room

### **INSTRUCTIONS TO CANDIDATES**

All two (2) questions are to be attempted.

10 minutes reading time is allowed prior to the start of the examination

Unless otherwise stated all references to Act and Regulations are to the

Work Health and Safety Act 2011 Work Health and Safety Regulation 2017 Work Health and Safety (Mines and Petroleum Sites) Act 2013 Work Health and Safety (Mines and Petroleum Sites) Regulation 2022 Explosives Act 2003 Explosives Regulation 2013

# ANSWER BOOKLET

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#### Banjo mine workings are shown on the attached plan

Banjo mine is an underground coal mine that you have only recently taken over as the mining engineering manager. The mine is achieving an average of 25 000t per day whilst having the capacity to achieve 50 000t per day from 1 longwall, 2 x development units. The Mine operates 5 days per week with 1 maintenance shift scheduled mid week and an additional maintenance shift on weekends.

The surface of the mine is a national park with limited access and limited ability to gain approval for infrastructure. Typically only the first 100m of LW have surface access as well as the area above the main headings.

The seam being extracted, the Middle seam, is 7m thick at a depth of 180m with only the lower 2.9m being extracted. There is a tuff 300mm tuff starting 3.5m from the top of the seam. The average virgin in-situ gas content has increased with each LW block and is now 6m3/t at 100% CH4 distributed equally between the top and bottom part of the seam. The seam has a medium to low propensity to spontaneous combustion and the permeability of the seam is 125 millidarcy. The immediate roof is relatively weak requiring the installation of standing support in the TG. The dip is as shown on the plan and 1 in 50.

During production the mine regularly has longwall delays due to gas and development has issues with methane at the commencement of the hazardous zone.

Only one shaft is in operation shaft A.

#### Question 1 (total 20 marks)

 a) Identify and list all relevant issues and factors that you believe must be incorporated in, or be addressed by, the ventilation network you will adopt. Your answer should include but not be limited to issues regarding gas management, spontaneous combustion, mine operation and ventilation requirements. (40 marks)


b) Explain and justify how each of the issues you have identified will be managed in your ventilation network. (40 marks)

Mining ei	ngineering manager	of underground	coal mines – I	MB2 Mine Ven	tilation – M	arch 2023	

c) What are the treatment options for the gas management issues now and, in the future, and how would you manage the issues. (20 marks)

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#### **Question 2**

On the accompanying Banjo mine plan;

a) Show the locations of all production faces, together with their daily production levels, ventilation quantities and expected gas make (20 marks)

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b)

i) Ventilate the plan using the code of signs specified by Survey and Drafting Directions for Mine Surveyors, addressing issues identified in question 1. (50 marks)


Mining engineering manager of underground coal mines – MB2 Mine Ventilation – March 202	23

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ii) Show the air quantities entering each production panel measured 100m last completed line of cut throughs. (10 marks)	from the
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<ul> <li>c) Show location and type of gas monitoring sensor for each production distri outbye areas of the mine. Indicate methane alarm level limits at each sens marks)</li> </ul>	ict and sor. (10

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d) Show the ventilation quantities entering each surface intake entry to the underground workings and each surface return entry from the underground workings as well as the fan operating pressure. (10 marks)



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CANDIDATE NUMBER:	(write in from your letter)
EXAMINATION:	Mining engineering manager of underground coal mines
EXAM PAPER:	MB3 – Coal Mining Practices
DATE:	Friday 3rd March 2023

# EXAMINATION BOOKLET

#### CANDIDATE NUMBER:

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Question Number		Mark	Available mark	<b>Marked by</b> Name	Summary comments to justify, as necessary
	а		2		
1	b		4		
	с		10		
	d		4		
	Subtotal		20		
	а		6		
2	b		14		
	Subtotal		20		
	а		4		
	b		4		
3	с		4		
	d		4		
	e		4		
	Subtotal		20		
	а		3		
4	b		3		
	с		14		
	Subtotal		20		

Question Number		Mark	Available mark	<b>Marked by</b> Name	Summary comments to justify, as necessary
	a		2		
5	b		4		
	с		14		
	Subtotal		20		
	а		4		
6	b		14		
	Subtotal		20		
	а		4		
7	b		16		
	Subtotal		20		
	а		2		
	b				
8	с		4		
	d		14		
	Subtotal		20		
PAPER	TOTAL		100		Marks checked by:



(MB3)

Work Health and Safety (Mines and Petroleum Sites) Act 2013 Work Health and Safety (Mines and Petroleum Sites) Regulation 2022

#### EXAMINATION FOR CERTIFICATE OF COMPETENCE Mining engineering manager of underground coal mines

## **Coal Mining Practices Paper**

Friday 3rd March 2023 9:50am to 13:00pm (180 minutes)

Venue: Tocal College, Paterson NSW 2421

Room: Glendarra (2) Conference Room

#### **INSTRUCTIONS TO CANDIDATES**

Only five (5) out of seven (7) questions are to be attempted:

- four (4) out of six (6) underground questions and
  - one (1) out of two (2) open cut questions

All questions are of equal value - 20 marks each

10 minutes reading time is allowed prior to the start of the examination

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#### Question 1 (total 20 marks)

You are the Mining Engineering Manager of a mine that operates a "Drift Winder" system for both personnel and materials transport in the 980m long main drift. There are also an Upcast fan shaft and a conveyor drift with a small man riding Dolly car.

At 1:15am on Sunday morning you receive a phone call from the Shift Undermanager, who is new to the mine, informing you that the "Dolly Car" has derailed while taking down a full trailer of timber props and a trailer of bulk stonedust bags at the 635m marker.

a) What are your immediate concerns? (2 marks)

b) What are your immediate actions? (4 marks)

c) Explain in detail how this incident would be recovered. (10 marks)

d)	What are	your lo	ong-term	actions	to prevent	t a re-occur	rence? (4	marks)
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#### Question 2 (total 20 marks)

You are the Mining Engineering Manager at a modern UG longwall mine that has a 2.9m seam with a 250m wide block and has encountered a hard dyke that is approximately 1.2m thick at chainage 2315m during the development of the main gate roadways.

The same dyke had been encountered at chainage 1982m in the tail gate roadways but wasn't as hard.

The total chainage of the block is 3800m.

The company General Manager wants you to investigate options of dealing with the dyke through this area.

a) Explain what you would do to determine this. (6 marks)

The decision has been made to retreat the longwall through this area.

b) Explain in detail how this could be safely achieved. (14 marks)

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#### Question 3 (total 20 marks)

You are the Mining Engineering Manager at a UG longwall mine that is currently on the 26<sup>th</sup> 250m wide x 3400m long block. The seam is 8m thick and has a high sulphur band at the roof and is liable to spontaneous combustion.

a) List the most likely places to have a spontaneous combustion event underground. (4 marks)

b)	What are the signs / physical indicators that indicate a potential spontaneous combustion event? (4 marks)
c)	List the triggers that you would have in your spontaneous combustion plan. (4 marks)
d)	List the controls you would have in your spontaneous combustion plan. (4 marks)
e)	Actions once a fire / spontaneous combustion is confirmed. (4 marks)

#### Question 4 (total 20 marks)

You are the Mining Engineering Manager of a deep (375m) underground mine that has a drift winder for men and materials, a bulk winder for coal haulage, an upcast fan shaft and a down cast shaft for ventilation with a 2<sup>nd</sup> egress man riding cage.

An hour before the end of shift change on Dayshift the man riding cage has stopped at the 284m mark while coming up with the Production Manager, shift Undermanager, outbye Deputy & 2x fitters are in the cage.

The Electrical Engineering Manager then informs you that there has been a small fire in the surface electrical control panel and the repairs are expected to take 24 hours.

a) What are your immediate actions? (3 marks)

b) Who would you notify of this incident and why? (3 marks)

c) What would your longer-term actions be and a time frame around them? (14 marks)

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#### **Question 5 (total 20 marks)**

You are the Mining Engineering Manager of a mine that uses the "Herringbone System" of mining. The seam is 3.6m thick with a wet floor that breaks up in places. The lefthand side "runouts" are at 30m centres. At the end of each 105m "runout" a plunge is done both left and right.

During several of these plunges the roof has fallen in.

a) What is the importance of these plunges? (2 marks)

b) What are your immediate actions? (4 marks)

c) What are your long-term actions? (14 marks)

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#### **Question 6 (total 20 marks)**

You are the Mining Engineering Manager of a modern longwall mine with a 400m wide face. The full 4.2m thick, moderately gassy seam is extracted from under a 7.4m sandstone roof with a full depth of cover of 250m under a National Park.

The goaf has a tendency to hold up for an extended distance before a large area of goaf falls all at once.

a) What are the potential hazards to the workforce and mine? (4 marks)

b) What controls are you going to have in place for each hazard? (14 marks)

Mining engineering manager of underground coal mines – MB3 Coal Mining Practices – N	larch 202
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Question 7 – Open Cut (total 20 marks)	
You are the Mining Engineering Manager of a modern open cut where a new undergrour nine is about to be started in the northern end of the lease using the 46m highwall for the idits. The initial access to the underground project area is through your mine. This is expected to take approximately 11 months.	าd eir

a) What are your concerns or potential hazards during the project phase? (4 marks)

	Mining engineering manager of underground coal mines – MB3 Coal Mining Practices – N	larch 2023
b)	)What controls are you going to put in place for each concern / hazard? (16 marks	)
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#### Question 8 – Open Cut (total 20 marks)

You are the Mining Engineering Manager of an open cut mine that has a washery attached on the lease.

Due to the increase in production over the last several years the current "tailings dam" is reaching its capacity.

A decision has been made to increase the size of the existing dam.

a) What are the options for increasing the size of the dam? (2 marks)

b) Select your preferred method.

c) What are the hazards with this method? (4 marks)

d) What are the controls for each hazard? (14 marks)

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END OF QUESTIONS	
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