Underground coal mines – identification of returns and hazardous zones

About this guide

Returns and hazardous zones in underground coal mines have specific requirements when certain plant is used in those areas. This document contains examples of some of the areas where it may be difficult to identify a return or hazardous zone and an indication of where they may be located.

Returns

A return is an airway that carries air from the mine. There may be some uncertainty about when an airway changes from carrying air into the mine to when it is carrying air out of the mine. The plans A to F below show a range of layouts that indicate where this change occurs:

- A: Longwall installation face
- B: Working longwall face with homotropal maingate belt road
- C: Working longwall face with maingate forcing fan
- D: Five heading development
- E: Pillar extraction – flood ventilation
- F: Pillar extraction – flanking returns

Hazardous zones

A hazardous zone is defined in the Work Health and Safety (Mines) Regulation 2014 as:

‘...in an underground coal mine, means each of the following:

a) any part at the mine in which the concentration of methane in the general body of the air is 1.25% by volume or greater,
b) a return airway,
c) any part of an intake airway that is on the return side of such points that are within 100 metres outbye of:
   i. the most inbye completed line of cut-throughs, or
   ii. any longwall or shortwall face, but only to the extent that the intake airway is on the intake side of that face (but not if the longwall face is an installation face at which the development of the face, and mining for development coal, have been completed and at which longwall mining has yet to commence).

The plans G to N below show a variety of layouts that indicate the extent of the hazardous zone:

- G: Longwall installation face
- H: Longwall installation face being widened
- I: Working longwall face with maingate forcing fan
- J: Working longwall with stopping outbye the face line
- K: Working longwall face with maingate ventilation intake shaft
- L: Five heading development
- M: Pillar extraction
- N: Development of a side panel
Further guidance

The attached diagrams are an indication only of where the hazardous zones and returns may be located in the particular example. They do not include all aspects of a ventilation system that may be relevant at a particular mine and may impact on the actual location of a return or hazardous zone, such as the existence of additional intake shafts or simultaneous development of an adjacent longwall. The diagrams do not address whether a hazardous zone may be present within the meaning of paragraph (a) of the definition above.

To obtain further information, contact the closest office of NSW Trade & Investment to speak with a mining safety inspector or officer, or phone the main office (02) 4931 6666.
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PLAN A

RETURNS DIAGRAM:
LONGWALL INSTALLATION FACE

Key:
- Red: Direction of returns
- Blue: Direction of intake
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PLAN B

RETURNS DIAGRAM:
WORKING LONGWALL FACE WITH HOMOTROPAL MAINGATE BELT ROAD

Key:
- Red: Direction of returns
- Blue: Direction of intake
PLAN C

KEY:
- Fan
- Direction of returns
- Direction of intake

RETURNS DIAGRAM:
WORKING LONGWALL FACE WITH MAINGATE FORCING FAN
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Key:
- Fan
- Direction of returns
- Direction of intake

PLAN D

RETURN DIAGRAM:
FIVE HEADING DEVELOPMENT

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PLAN E

RETURNS DIAGRAM:
PILLAR EXTRACTION
FLOOD VENTILATION

Key:
- Direction of returns
- Direction of intake
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Key:
- Red: Direction of returns
- Blue: Direction of intake

PLAN F

RETURNS DIAGRAM:
PILLAR EXTRACTION
FLANKING RETURNS
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NOTE: THIS IS ONLY A HAZARDOUS ZONE DUE TO BEING A RETURN

Key:
- Hazardous zone

HAZARDOUS ZONE DIAGRAM:
LONGWALL INSTALLATION FACE

PLAN G

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**Plan H**

**HAZARDOUS ZONE DIAGRAM:**
LONGWALL INSTALLATION FACE WIDENING

Key:
- **Hazardous zone**
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Key:
- Fan
- Hazardous zone

HAZARDOUS ZONE DIAGRAM:
WORKING LONGWALL WITH MAINGATE FORCING FAN

PLAN I

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Plan J

Key:
- Hazardous zone

HAZARDOUS ZONE DIAGRAM:
- Working longwall with stopping outbye the face line
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PLAN K

HAZARDOUS ZONE DIAGRAM:
WORKING LONGWALL WITH MAINGATE VENTILATION INTAKE SHAFT - MAINGATE INTAKE

Key:
- Direction of intake
- Hazardous zone
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FIVE HEADING PANEL DEVELOPMENT

HAZARDOUS ZONE DIAGRAM:
FIVE HEADING PANEL DEVELOPMENT
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PILLAR EXTRACTION

GOAF

PARTIALLY GOAFED LINE OF C/T’s

LAST OPEN LINE OF C/T’s

100m OIB of C/T

Key:

Hazardous zone

HAZARDOUS ZONE DIAGRAM:
PILLAR EXTRACTION

PLAN M

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HAZARDOUS ZONE CONTINUES IN-BYE TO ALL POINTS ON THE RETURN SIDE

PROPOSED DIRECTION OF MINING

100m OB of CT

Key:
- Hazardous zone

PLAN N

HAZARDOUS ZONE DIAGRAM:
SIDE PANEL DEVELOPMENT