Coal Loss and Dilution
Considerations for
Western Canadian
Foothills Open Pit
Coal Projects

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Outline

- Terms / Definitions
- Factors affecting coal loss and dilution
- Coal mining methods / equipment
- Measurement Considerations
- Reconciliation Process



Terms / Definitions

- Contact / Interface:
 - Hanging Wall
 - Footwall
- Dip
- Dilution
- Mining recovery
- Mining section

- Parting:
 - Removable
 - Non-removable
- Seam



Factors Affecting Coal Loss and Dilution

- Coal seam dip
- Proximity to faulting / complex structure
- Seam thickness
- Hanging wall and footwall competency
- Dilution physical properties
- Preparation plant configuration:
 - Raw coal handling
 - Sizing / separation



Mining Methods by Seam Dip

- Steeply Dipping coal seams that dip greater than 55° to 60°
- Moderately Dipping coal seams that dip between 10° to 15° and 55° to 60°
- Shallow Dipping coal seams that dip between 0° and 10° to 15°

Steeply Dipping Seams





Moderately Dipping Seams





Shallow Dipping Seams





Complex Coal





Coal Mining Equipment

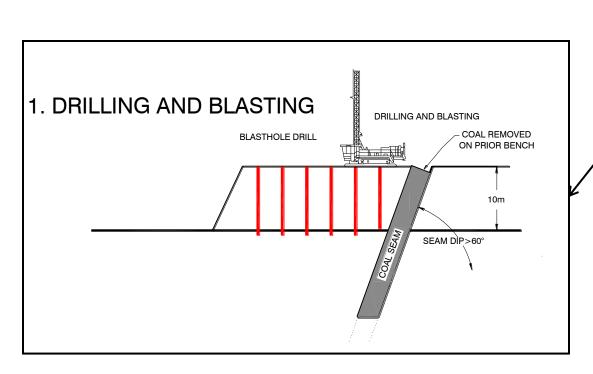
Coal Cleaning

- Dozer
- Backhoe

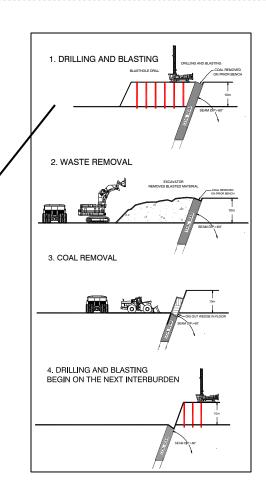
Coal loading

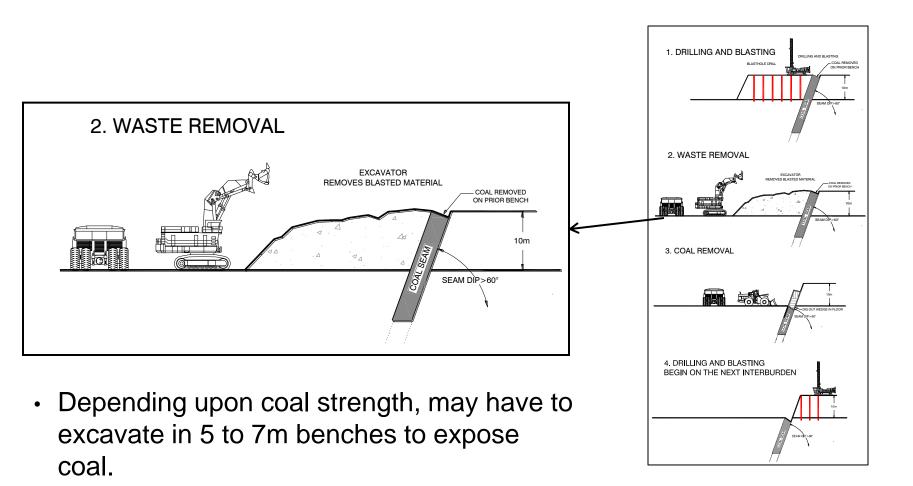
- Loader
- Backhoe (up to 90t class)
- Shovel or Excavator (over 90t class)



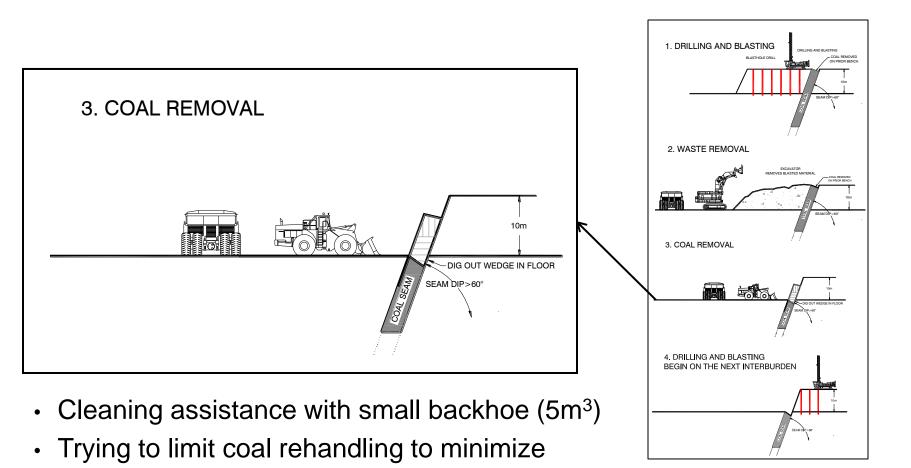


Do not have to blast through coal.



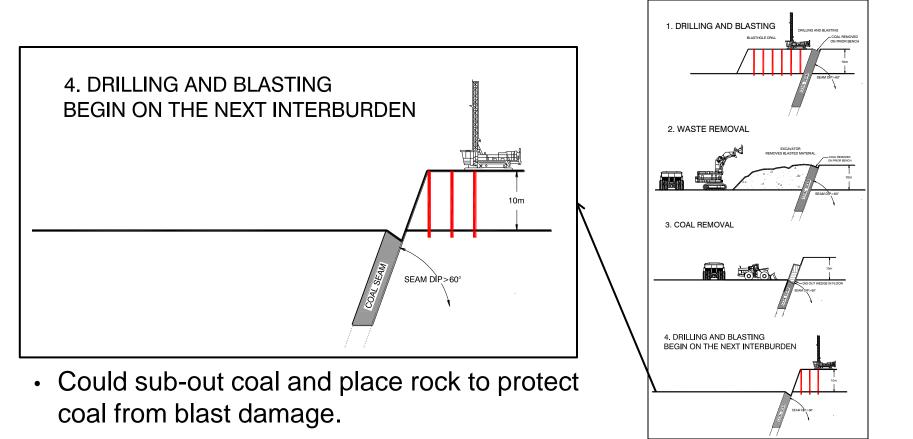








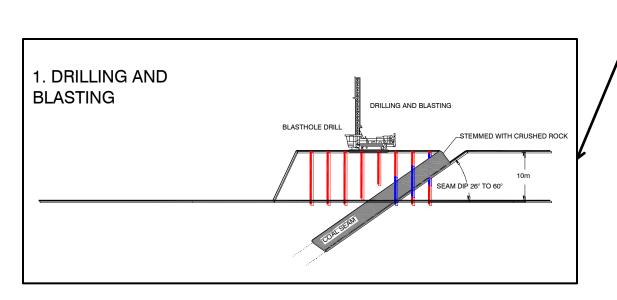
fines generation.



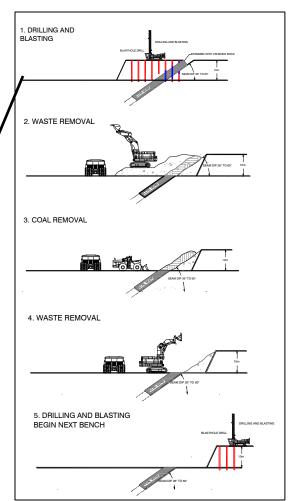


Steeply Dipping Coal Seams Coal Cleaning

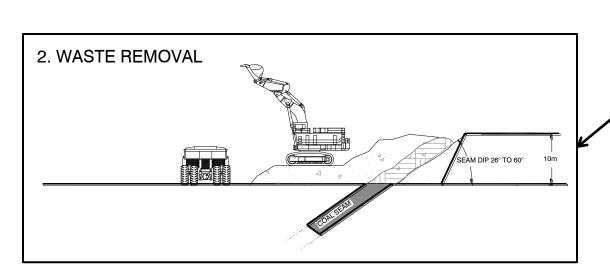




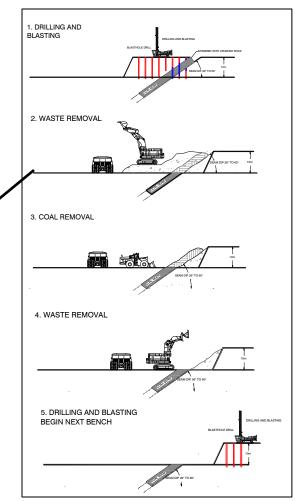
 Blast holes are geophysically logged to allow for controlled blasting through coal.

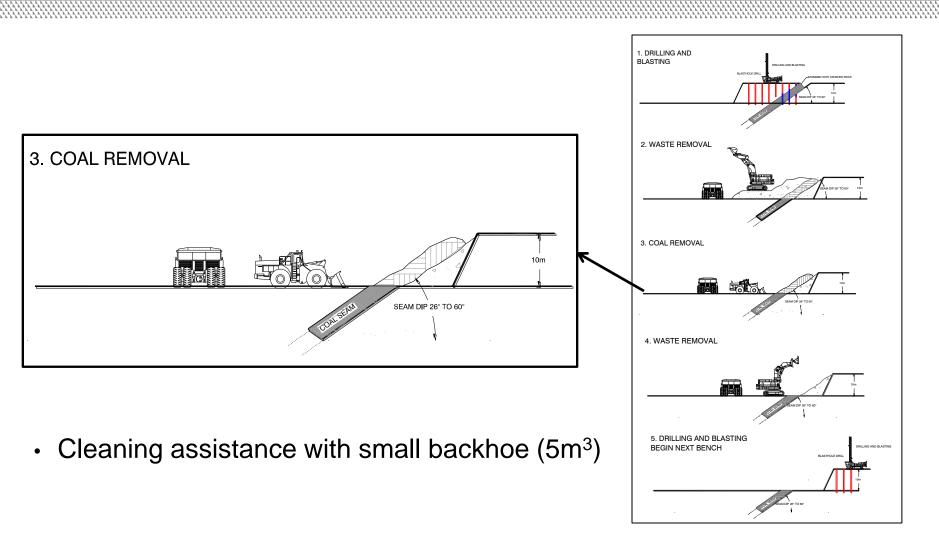




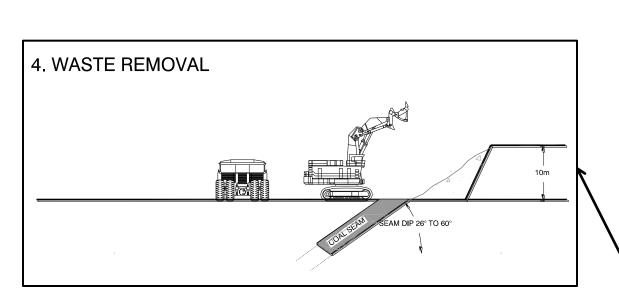


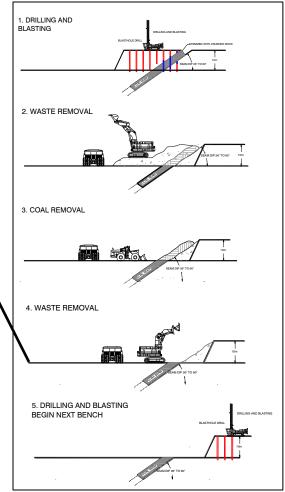
 Operator training is key to maintaining good recovery and controlling dilution.

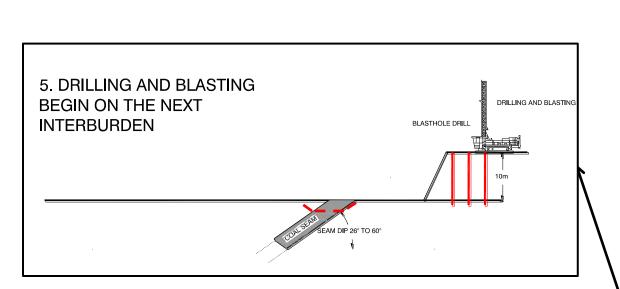




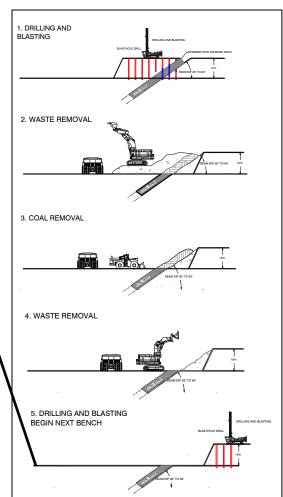








 May sub-out coal and replace with waste to prevent crushing/coal loss from traffic





Moderately Dipping Coal Seams Coal Cleaning



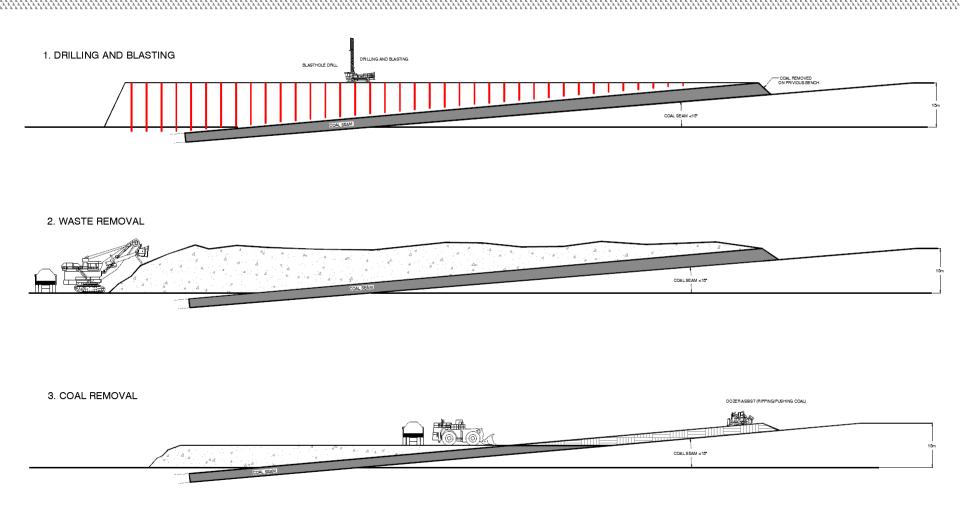


Moderately Dipping Coal Seams Coal Loading



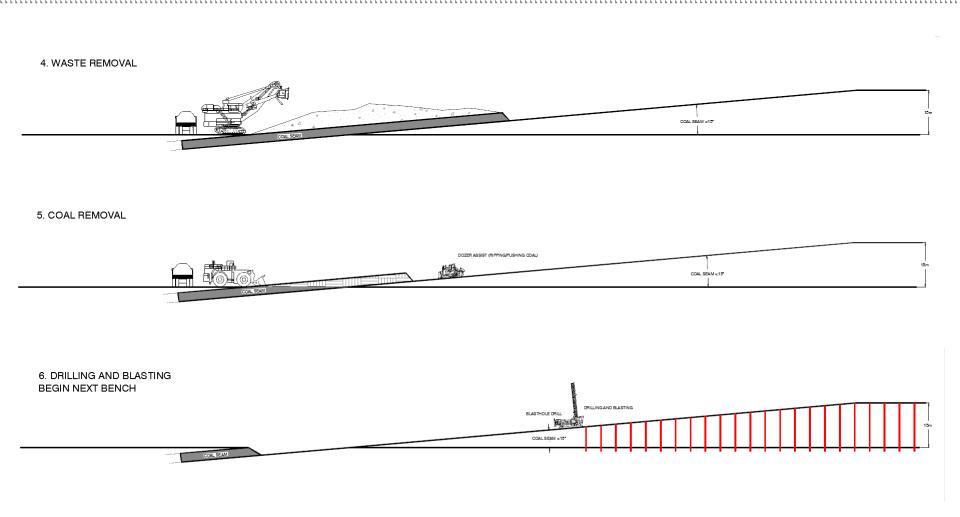


Shallow Dipping Coal Seams Mining Sequence





Shallow Dipping Coal Seams Mining Sequence





Shallow Dipping Coal Seam Coal Cleaning





Shallow Dipping Coal Seam Coal Cleaning





Shallow Dipping SeamsCoal Loading





Measurement Considerations

If you don't measure it, you can't manage it.....

- Geological Confirmation:
 - In pit mapping / surveys of coal seams
 - Seam thickness
 - Seam position relative to the modelled position
 - Coal quality



Measurement Considerations (continued)

Mining Considerations

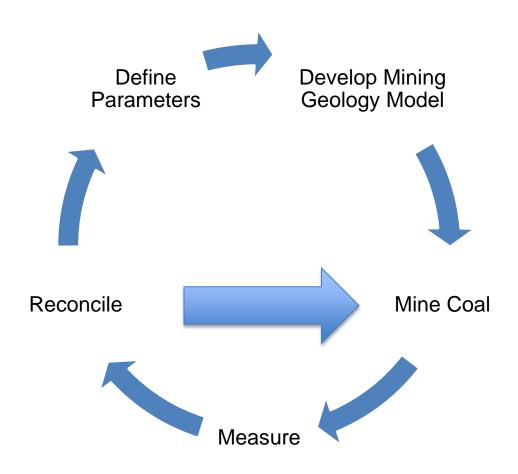
- Blasthole logging
- Blasting
- Bench grade control
- Incorporate into revised mining geology model

Measurement Considerations (continued)

• Plant:

- ROM stockpile management
- Raw coal quality
- Scales (calibration)
- Plant mass balance
- Product quality (moisture, ash)

Reconciliation Process





Questions?





