



# Mining Ventilation 2010



## Centennial Coal

*Controlling Dust*

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Brisbane

September 2010

FUTURE POWER



Centennial Coal

# Schedule

Dust is an increasingly pressing issue for those working in all mines and the problem can not be ignored.

This workshop will look at practical ways to minimize dust and improve air quality at your site by investigating how to identify and suppress dust issues on site.

**5.00** Introduction

**5.10** Identifying and monitoring dust control issues

**5.45** Updating your primary circuit to control for new and pre-existing dust

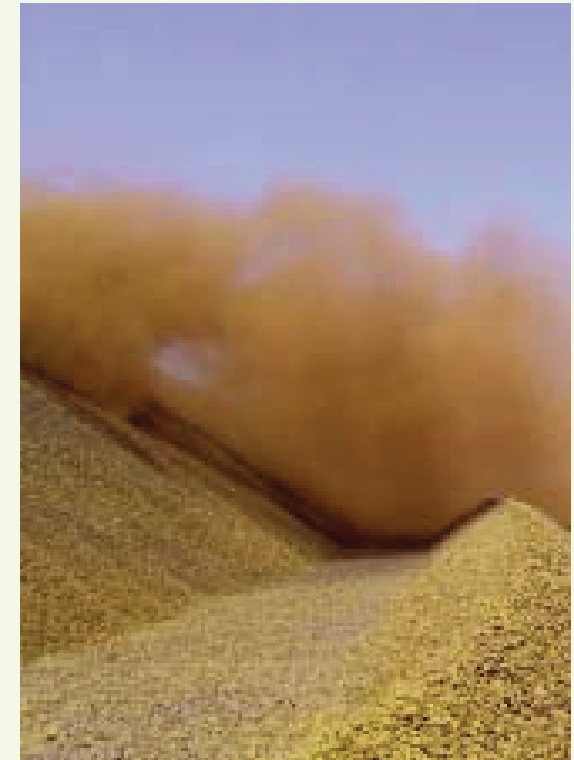
**6.15** Break

**6.45** Assessing available technologies

**7.10** Using and implementing dust suppression agents

**7.40** Reviewing dust control measures and areas for improvement

**8.00** End of workshop





# Introduction

*What is dust?*

*Concentration*

*Size*

- *Respirable dust (0.2-5Micron)*
- *Inhalable or visible dust (below 100 micron)*

*What is in dust?*

*Why is dust an issue?*

- *Health*
- *Explosions*
- *Visibility*



# Introduction



3M, 2007, *Underground Coal Mining 3M SDS2 Dust Suppressant*, (available from: <http://multimedia.3m.com/mws/mediawebserver?mwsId=66666UuZjcFSLXTtmxT2M8TcEVuQEcuZqVs6EVs6E666666--:accessed> 27 August 2010)

Georgius Agricola, 1556 *De Re Metallica*, (translated from the first Latin edition of 1556 by Herbert Clark Hoover and Lou Henry Hoover), pp213 - 214 (The Mining Magazine Salisbury House, London, E.G. 1912)

Historically dust has always been an issue ‘On the other hand, some mines are so dry that they are entirely devoid of water, and this dryness causes the workmen even greater harm, for the dust which is stirred and beaten up by digging penetrates into the windpipe and lungs, and produces difficulty in breathing, and disease...implants consumption in the body;...women are found who have married seven husbands, all of whom this terrible consumption has carried off to a premature death.’, Agricola.

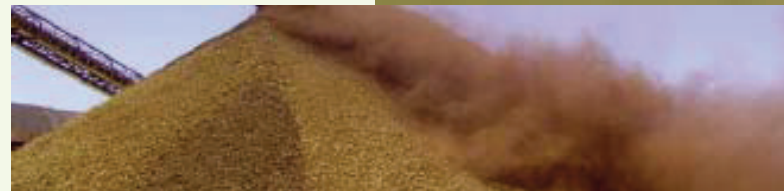
# Identifying

## Identify

- Seam characteristics
- Personnel
- Control measures
- Other dust sources
- Ventilation
- Cutting sequence
- Transfer points
- Machinery
- Other



CS Occupational Hygiene Services, *Inhalable Dust Health issues, Sampling Results Assistance and Control Measures*,, (available from: [http://www.dpi.nsw.gov.au/data/assets/pdf\\_file/0004/338791/Inhalable-dust.pdf](http://www.dpi.nsw.gov.au/data/assets/pdf_file/0004/338791/Inhalable-dust.pdf) : accessed 27 August 2010)



DuPont, *DuPont Dust Suppression*, (available from: [http://www2.dupont.com/Dust\\_Suppression/en\\_AU/products/products.html](http://www2.dupont.com/Dust_Suppression/en_AU/products/products.html) : accessed 27 August 2010)



# Monitoring

Dust sampling  
Personnel  
Static  
Equipment



SKC-PCXR8 dust sampler  
AusIMM Monograph 12,  
pp572,

Locations, frequencies and  
persons for Sampling (as  
issued by the Joint coal  
Board, 1994)

Health testing

Regulation

Airbourne Dust  
Major Hazard  
Management Plan

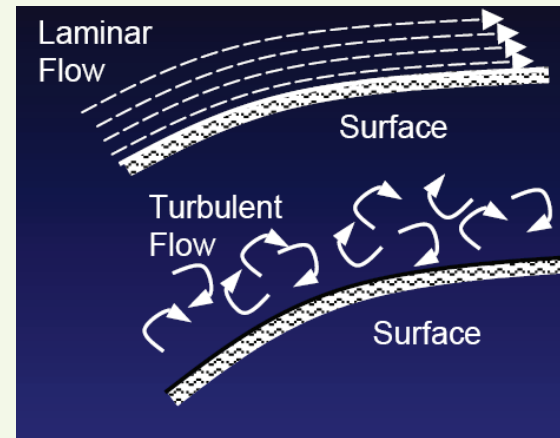
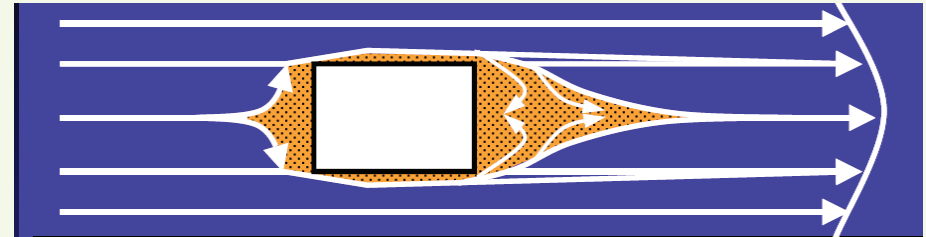


Hund dust sampler  
AusIMM  
Monograph 12,  
pp572,

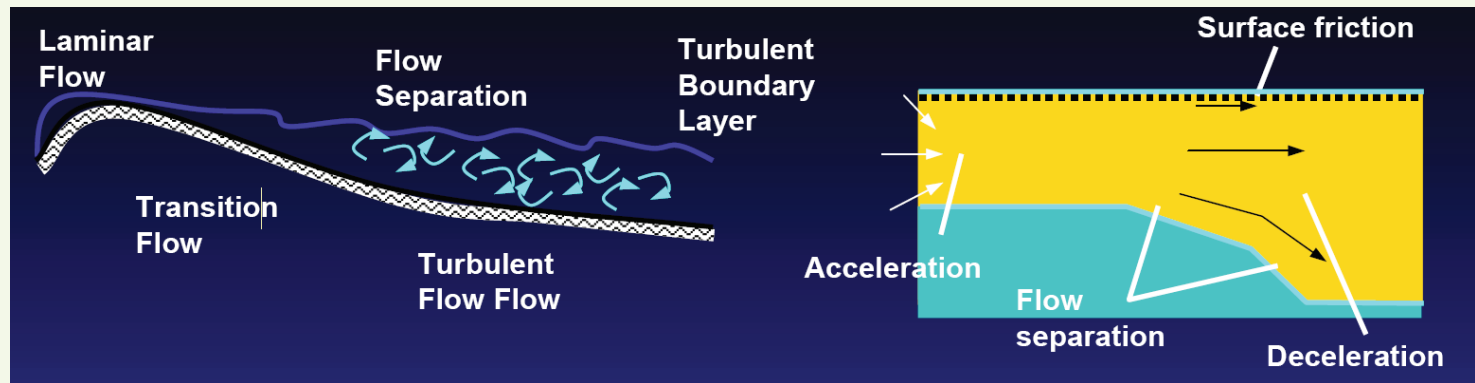
Column 1	Column 2	Column 3
Location	Frequency of sampling	Persons to be sampled
(a) In each part of the mine where longwall mining is carried out.	Each producing shift at intervals not exceeding six months.	Samples to be collected from the breathing zone of at least five persons including, where possible: <ul style="list-style-type: none"> <li>- a shearer-loader operator,</li> <li>- two powered support operators,</li> <li>- a deputy, and</li> <li>- one other person to be selected by the manager.</li> </ul>
(b) In each part of the mine where a continuous mining machine operates.	Each producing shift at intervals not exceeding 12 months.	Samples to be collected from the breathing zone of at least five persons in each unit including, where possible: <ul style="list-style-type: none"> <li>- a continuous miner driver,</li> <li>- a sideman or cable handler,</li> <li>- a shuttle car driver,</li> <li>- a deputy, and</li> <li>- a boot end attendant or other person to be selected by the manager.</li> </ul>
(c) In any place in or about an underground mine other than those referred to in (a) or (b) above, but including crusher stations and washeries	At intervals not exceeding 12 months.	Samples to be collected from the breathing zone of at least one person.
(d) In any place in or about an open-cut mine where dust may be present.	At intervals not exceeding 12 months.	Samples to be collected from the breathing zone of at least one person.

# Updating circuit

- Remove resistance
- Remove roughness
- Remove infrastructure
- Remove shock losses
- Prevent changes in circuit
- Optimise velocity and direction



UNSW, 2009, *Graduate Diploma in Ventilation*



# Assessment

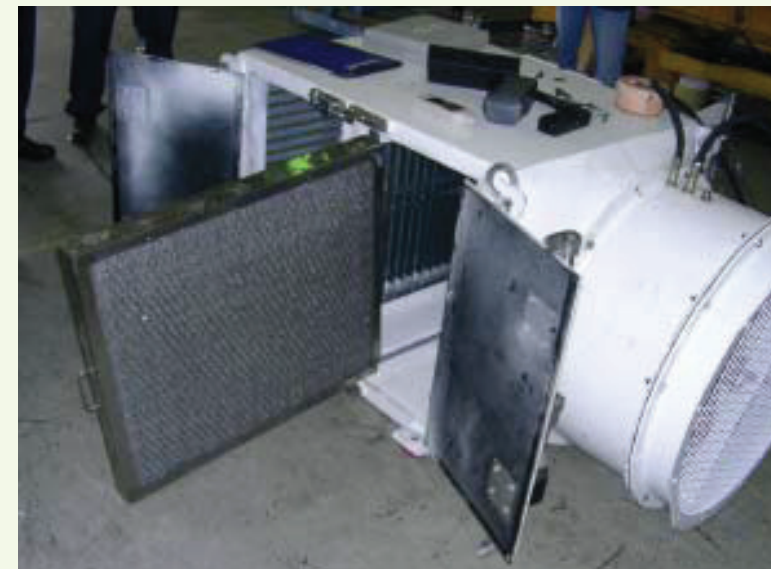
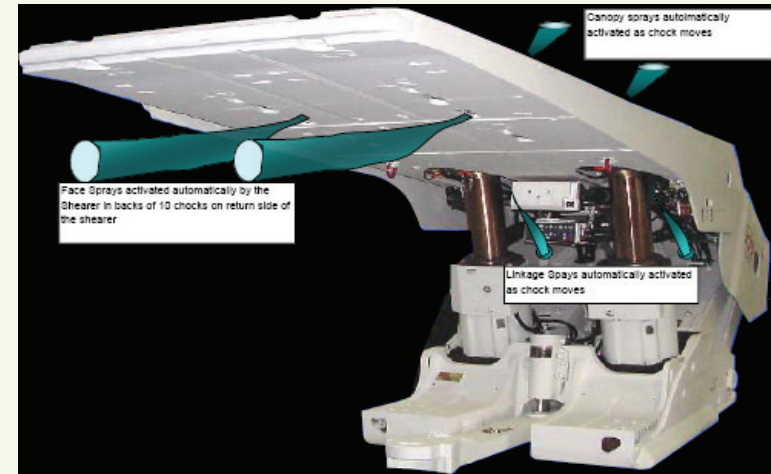
- Type of dust
- Cost
- Application
- Effective term
- Rates
- Maintenance
- Preparation
- Equipment
- OH&S issues
- Other issues





# Assessment

- Sealing and enclosing ore transfer points
- Ventilation direction
- Water infusion into seam
- Shearer initiation of chocks
- Water sprays
- Scrubbers



# Assessment

Activated dust control systems on:

- Shield
- Shearer
- AFC
- BSL



# Assessment

- Surfactants
- Salts
- Lignite
- Oils (fruit, canola, petroleum)
- Cement/ bitumen
- Polymers
- Lower dust products
- Operator location
- Ventilation as a control
- What can the individual do?





# Implementation

## Preparation

MSDSs

Resources

Risk assessment



## Application

How often

How

Rates

Procedures

Training

Equipment



# Review

- Appoint inspectors
- Dust management plans
- Safe work procedures
- Analysis of dust results
- Dust control training
- Mine workers health and safety records
- Test and assess for change
- Trigger Action Response Plans
- Audits







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Thank you.  
Any Questions?

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