CONTINUOUS MINER DUST SUPPRESSION

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DEVELOPMENT MINING PROCESS

THE PROBLEM

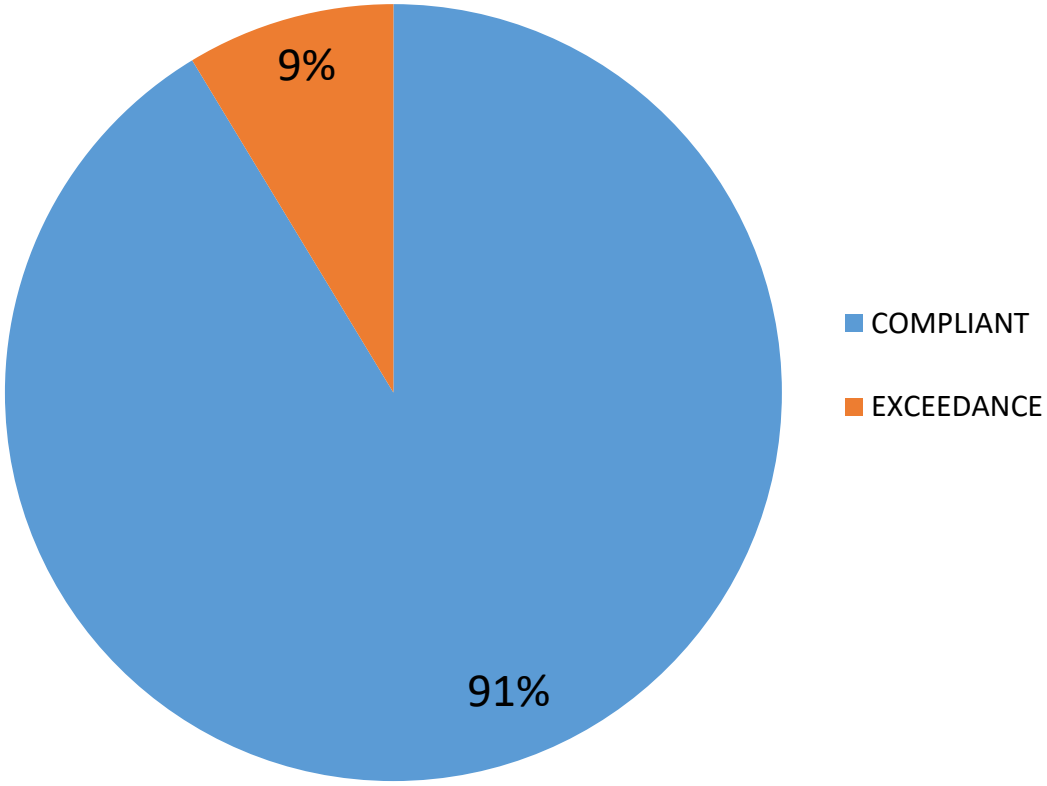
PRE ENGINEERING CONTROLS

- 13 EXCEEDANCES
- 150 TOTAL DEVELOPMENT PERSONAL SAMPLES

POST ENGINEERING CONTROLS

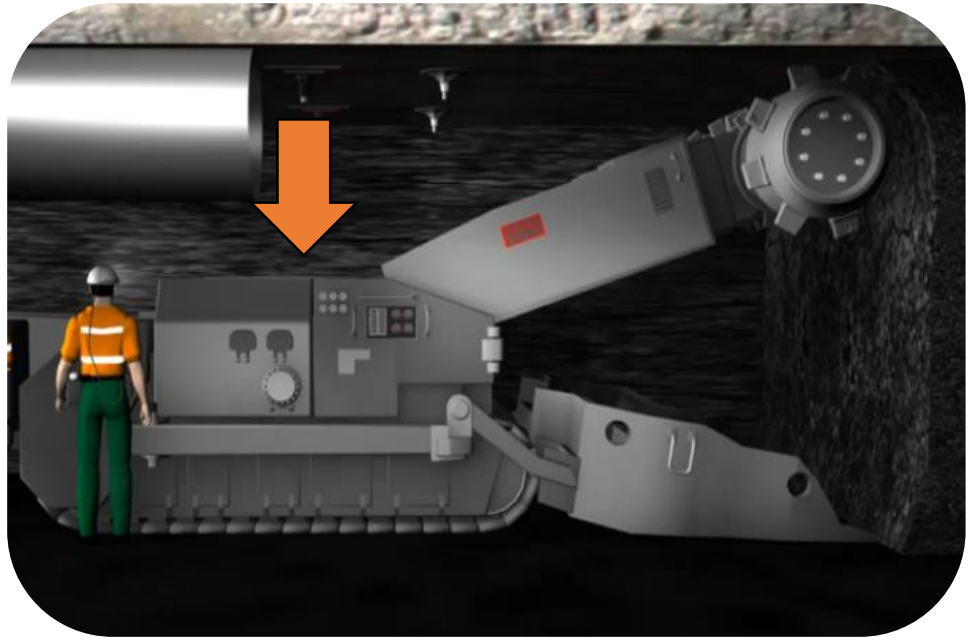
- 0 EXCEEDANCES
- 101 TOTAL DEVELOPMENT PERSONAL RESPIRABLE DUST SAMPLES
- 100 % COMPLIANCE

PERSONAL RESPIRABLE DUST SAMPLES PRIOR TO IMPLEMENTATION OF ENGINEERING CONROLS



THE SOLUTION

- HIERARCHY OF CONTROLS - ENGINEERING
- ISOLATION VIA CURTAIN SPRAY EFFECT OVER SUPPRESSION
- DUST CURTAIN SPRAY COMBINED WITH HYDRAULIC HOSE PROTECTION (ROOF BOLTER)
- REDUCED MAINTENANCE OF BOTH SPRAYS AND HYDRAULIC HOSES
- USES COOLING WATER DISCHARGE - PILOTED ON WITH CUTTER HEAD
- INTERCHANGABLE – SAME MODEL FOR LEFT AND RIGHT SIDE



INNOVATION

NO DUST SUPPRESSION

- COOLING WATER CIRCUIT DISCHARGED TO ATMOSPHERE
- NO ADDITIONAL BENEFIT

INITIAL CURTAIN SPRAY

- COOLING WATER UTILISED IN CURTAIN SPRAY BAR
- FLOW RATE: 42 L/MINUTE
- REDUCTION IN RESPIRABLE DUST EXPOSURE BY 53%

INTEGRATED POLY SPRAY

- COOLING WATER UTILISED IN INTEGRATED POLY SPRAY
- FLOW RATE: 21.42 L/MINUTE
- REDUCTION IN RESPIRABLE DUST EXPOSURE BY 85%
- REDUCTION IN WATER USAGE OF 21 L/MINUTE

BENEFIT/EFFECT

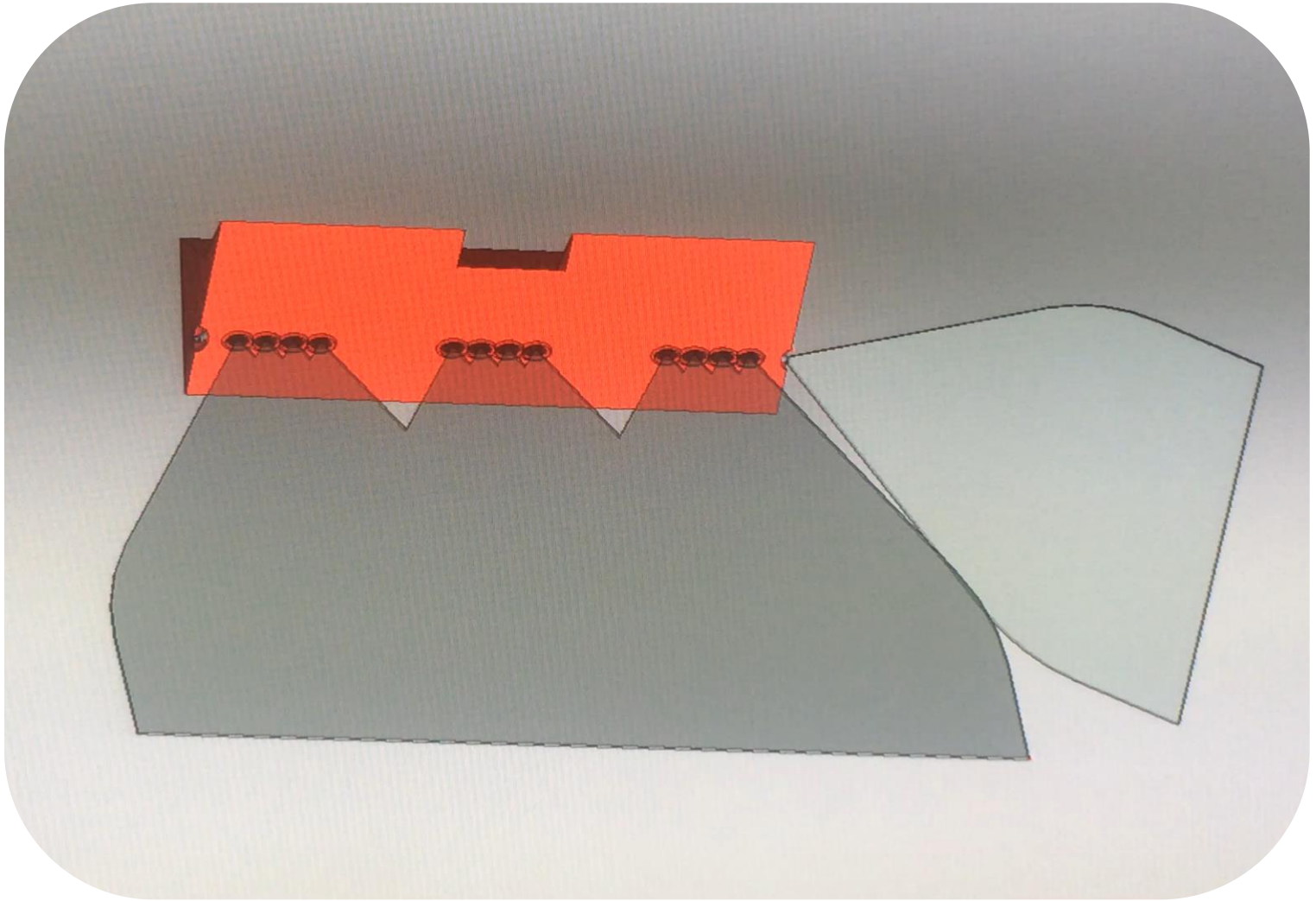
CURTAIN SPRAY BANKS – 60 DEGREES

- MITIGATES LOSS OF WATER
- ENHANCE THE EFFECT OF VENTILATION

END SPRAY – 45 DEGREES

- REDIRECTION OF DUST ACROSS FACE AND THROUGH THE VENTILATION TUBE

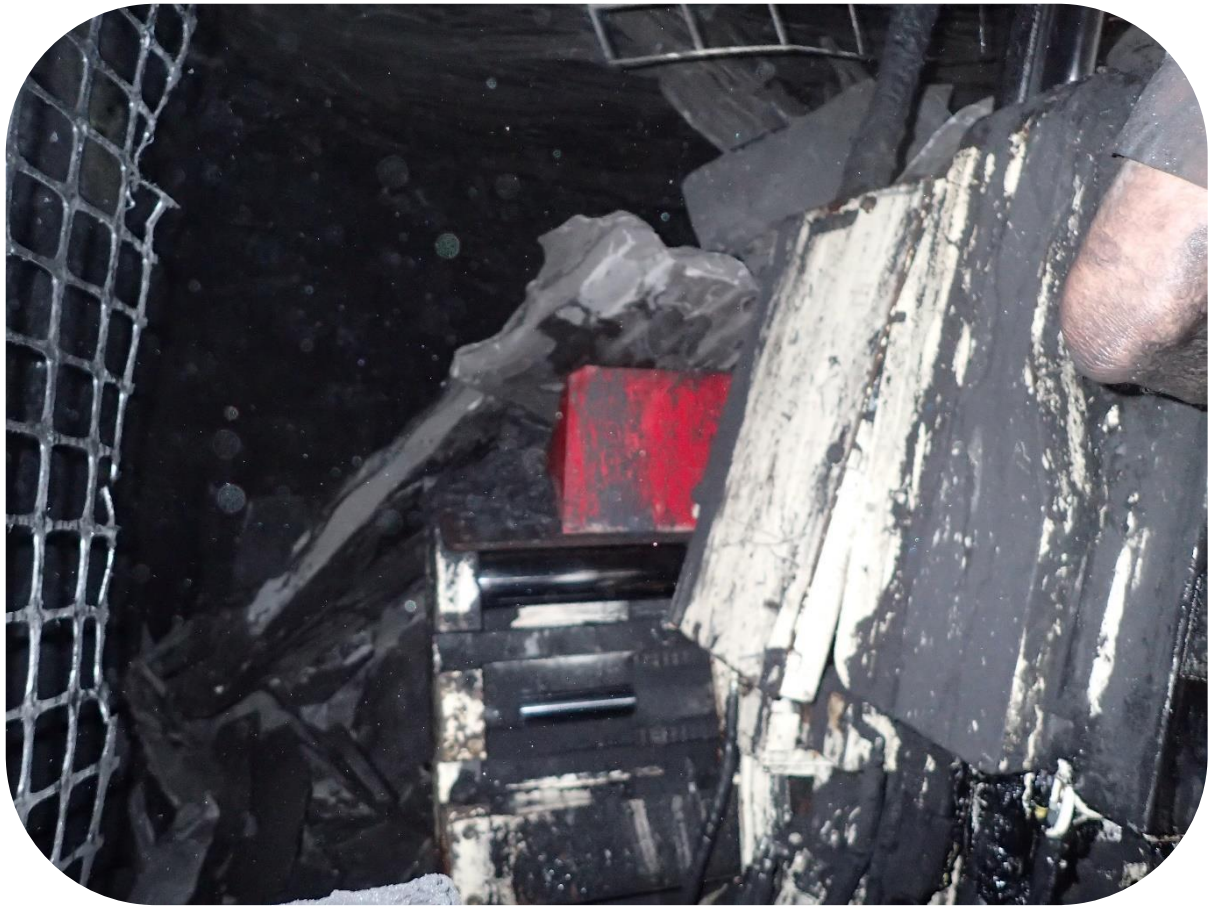
FAN SPRAY APPLICATION ANGLE – 65 DEGREES



BENEFIT/EFFECT

BENEFIT/EFFECT

REDUCED RESPIRABLE DUST EXPOSURE



COST SAVING

INCREASED PRODUCTIVITY AND REDUCED MAINTENANCE

SECONDARY USE OF WASTE WATER

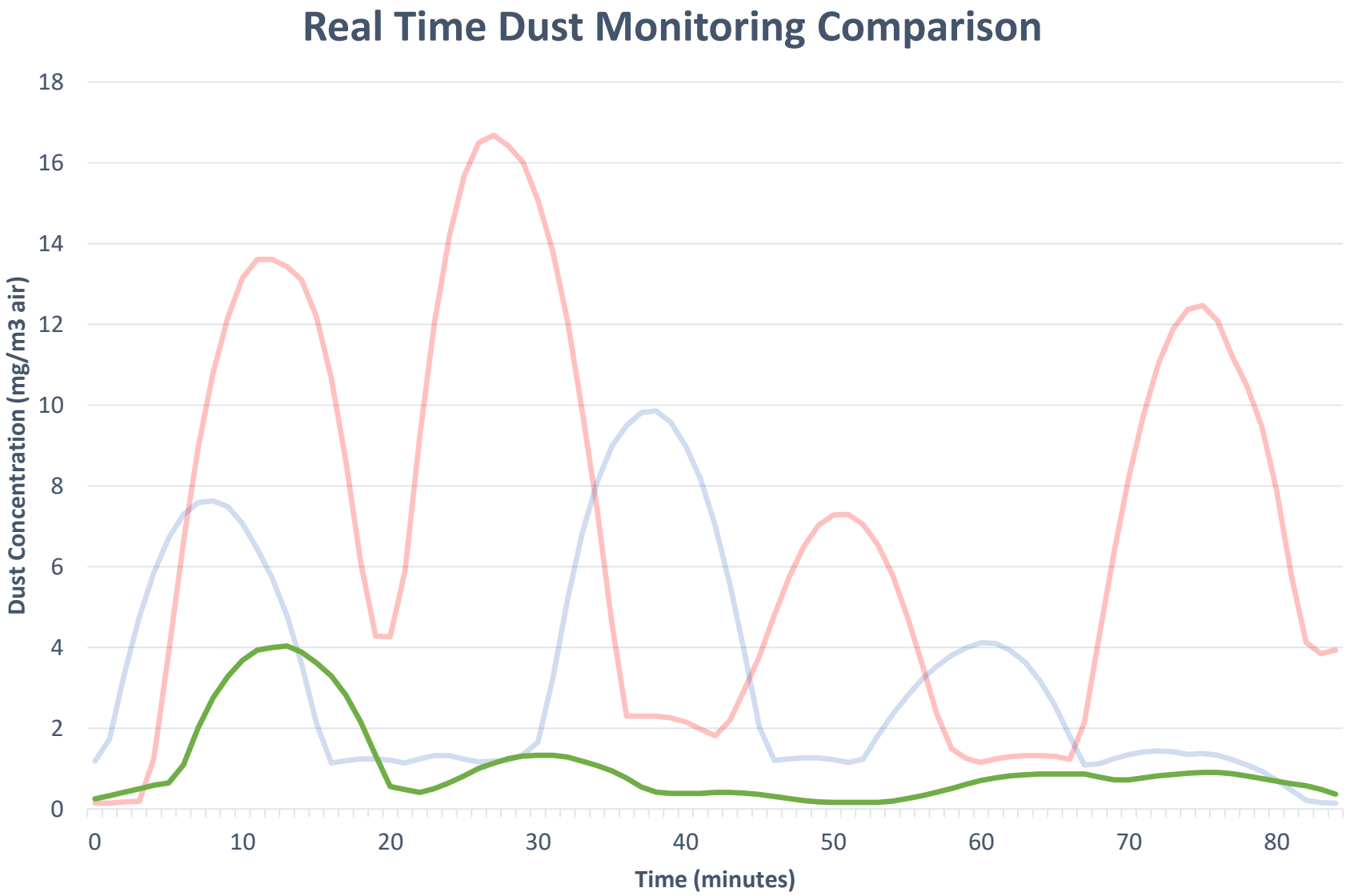
BENEFIT/EFFECT

RESPIRABLE DUST AVERAGE CONCENTRATIONS

NO DUST SUPPRESSION
6.99 mg/m^3

INITIAL CURTAIN SPRAY DESIGN
3.29 mg/m^3

INTEGRATED POLY SPRAY
1.03 mg/m^3



TRANSFERABILITY

CONTINUOUS MINERS

- MODIFICATIONS MAY BE NEEDED DEPENDING ON THE MACHINE

CONVEYOR BELT – BOOT END

- INTEGRATE SPRAYS INTO HUNGRY BOARD WITH A LOWER SPRAY ANGLE

COAL PREPARATION PLANT - HOPPER

- ROBUST PROTECTION OF DUST SUPPRESSION SPRAYS – INCREASED RELIABILITY

HARD ROCK

PORT – TRAIN LOAD OUT

COSTING

TOTAL SAVINGS OF 10 DAYS LONGWALL FLOAT AND $238 150

The integrated hungry board spray has a predicted life cycle of 4 year at a cost of $3, 568 per unit.

Annually the fleet of 3 continuous miners use approximately 110 5-1 hydraulic hoses.

$$110\ hose\ kits\ annually\ \times \frac{\$2095}{hose\ kit} = \$\mathbf{230\ 450}\ \boldsymbol{in\ material\ costs\ annually}$$

$$110\ hose\ kits\ annually\ \times \frac{70\ \cancel{minutes}}{hose\ change} \times \frac{1\ hour}{60\ \cancel{minutes}} = \mathbf{128.3}\ \boldsymbol{hours\ lost\ production}$$

$$Approximation\ of\ 10\ days\ Longwall\ Float$$

$$128.3\ hours\ labour\ \times \frac{\$60}{1\ hour}\ fitter\ labour = \$\mathbf{7700}\ \boldsymbol{in\ labour\ costs\ annually}$$

THANK YOU
QUESTIONS?