



# Joy Mist Drilling System

Presented By:  
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Joy Mining Machinery



# What is Mist Drilling?

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**Joy's Mist Drilling System is patented as a "Low volume air-water drilling systems and methods"**

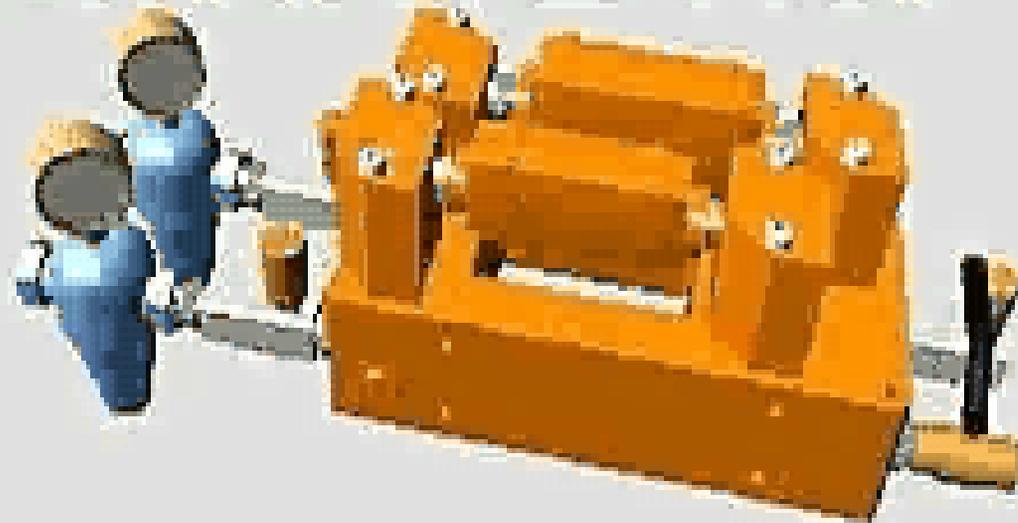


# Mist Drilling

- Mist Drilling is a positive displacement method of flushing the drill hole
- It uses a mixture of low pressure air and water to flush the drill cuttings away from the drill bit
- The air and water are combined in a simple mixing chamber
- Mine supply water is used
- A compressor is onboard the bolting machine, to provide the required air supply



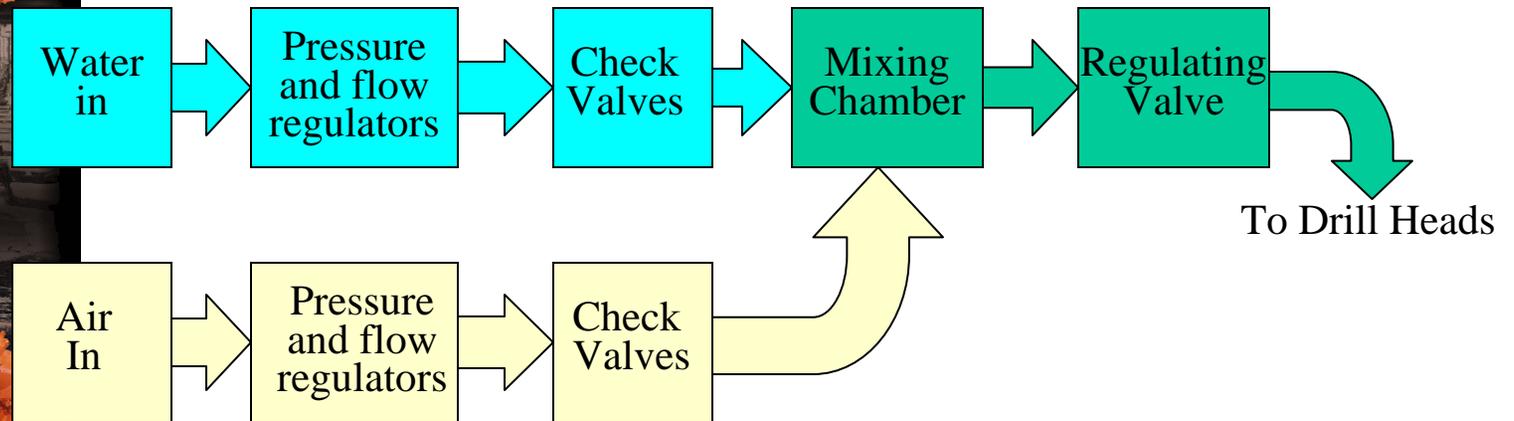
# Mist Drill



# Block Assembly



# Simplified Misting Block Diagram





# Joy Mist Drilling System

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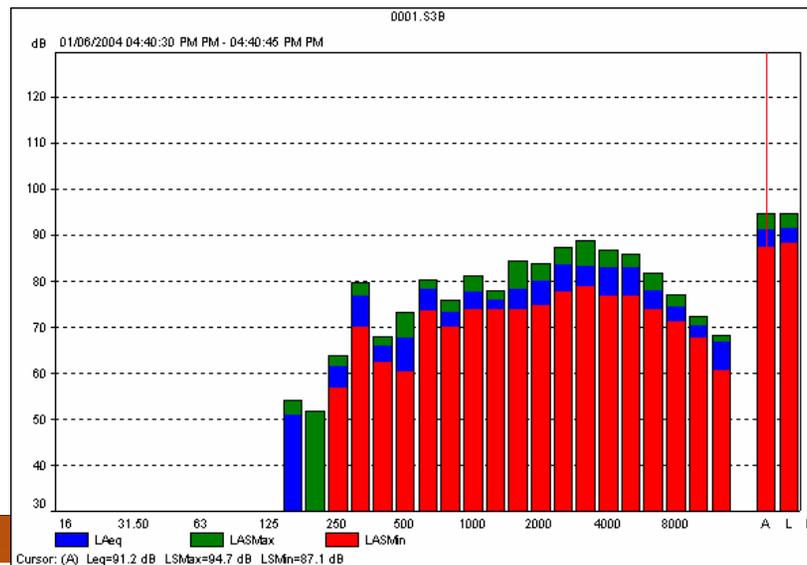
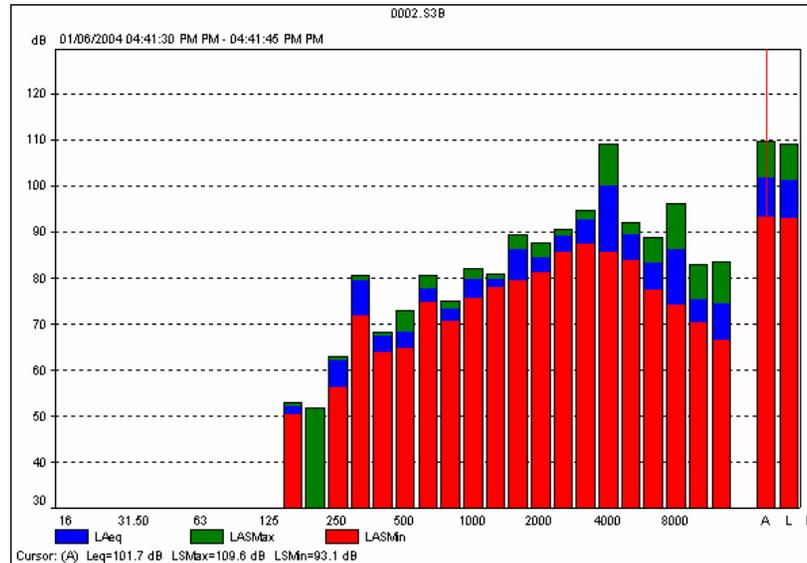




# Mist Drilling Advantages

- Over Dry Drilling – Reduction in Noise Exposure\*

\*Information  
Courtesy  
of NIOSH



**Dry Drilling**  
Avg dBA = 101.7

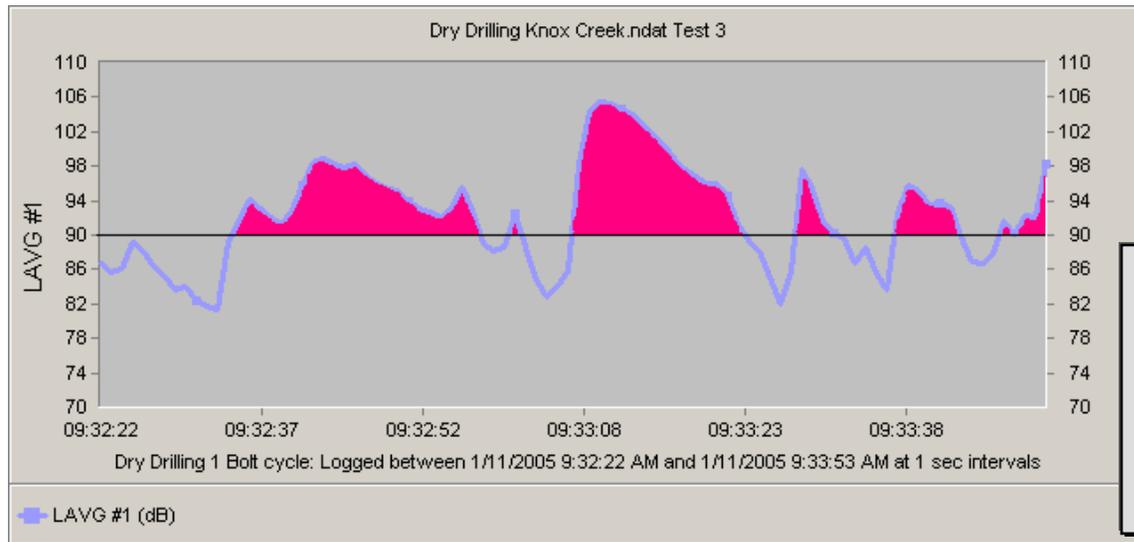
As much as 10 dBA  
reductions seen in  
some cases

**Mist Drilling**  
Avg dBA = 91.2

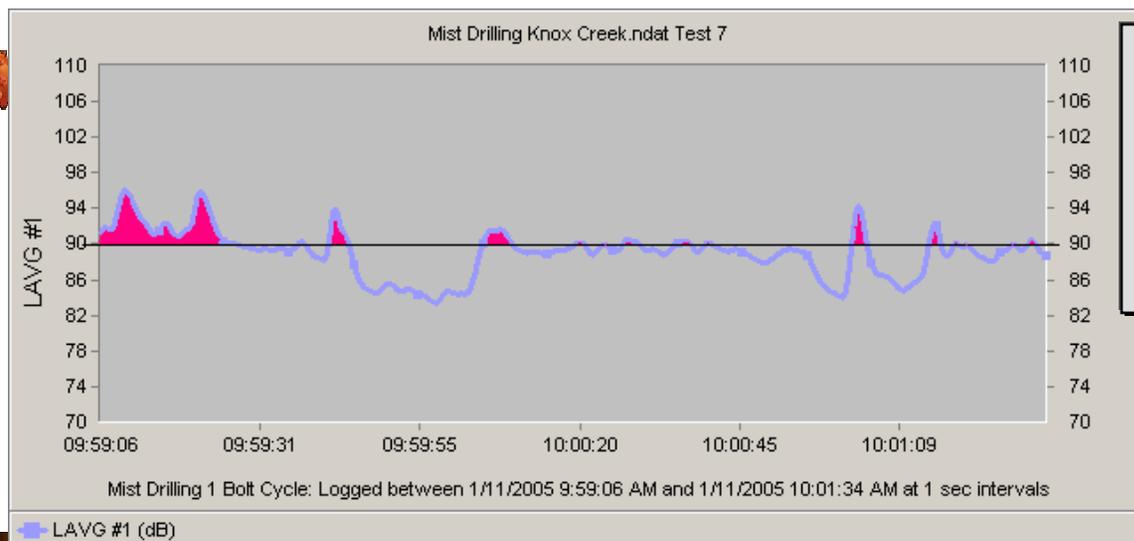


# Mist Drilling Advantages

- Over Dry Drilling – Reduction in Noise Exposure



**Avg dBA = 94.6**  
**DOSE = 0.5% per bolt**  
**200 bolts per shift to reach 100% dose**

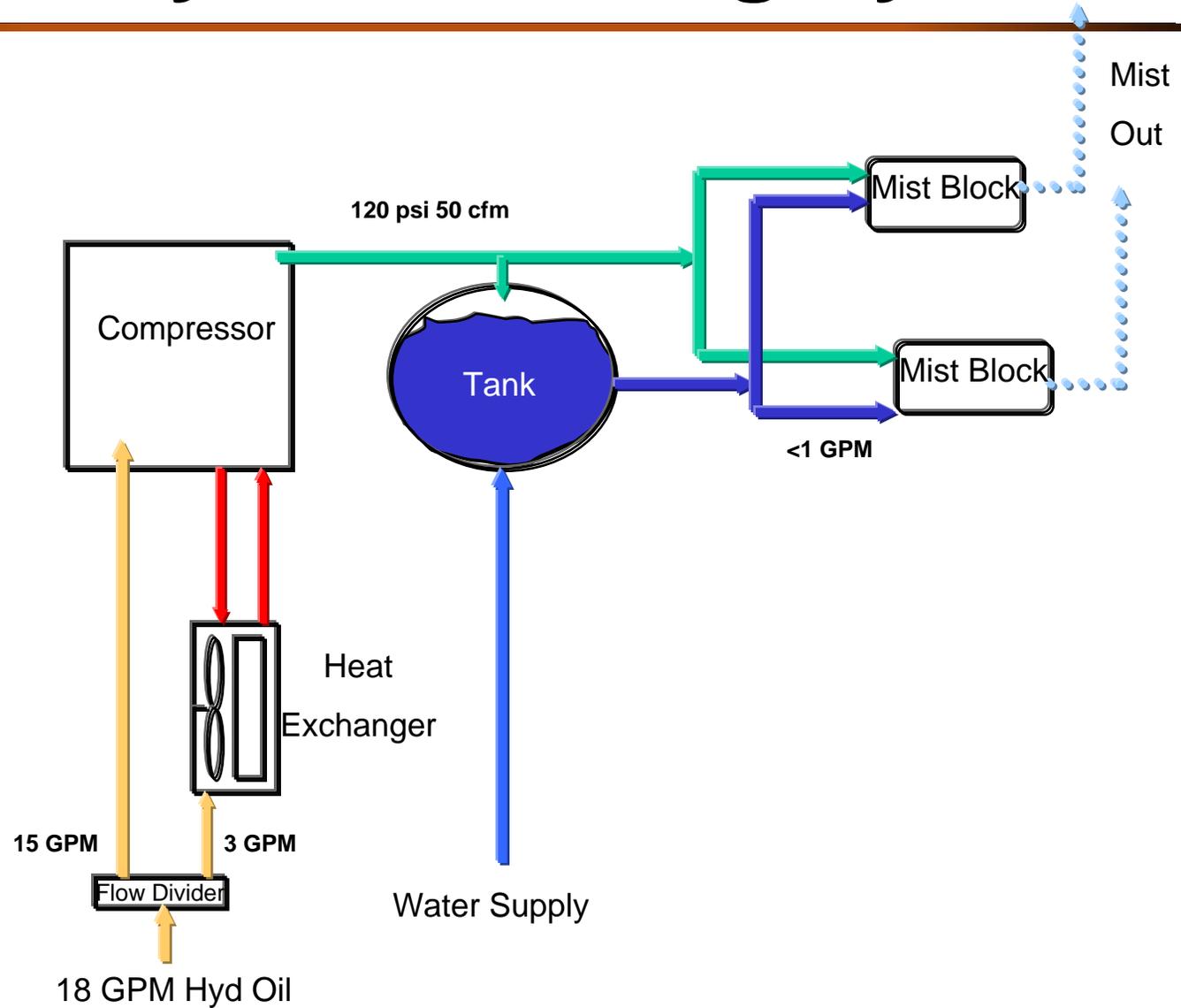


**Avg dBA = 89.4**  
**DOSE = 0.2% per bolt**  
**500 bolts per shift to reach 100% dose**





# Joy Mist Drilling System





# Joy Mist Drilling System



**Bluefield Coal Show Display  
September 2003  
Mine Expo - Oct 2004**





# Joy Mist Drilling System

## COMPRESSOR



Hydraulic Drive  
29"L x 20"H x 18"W

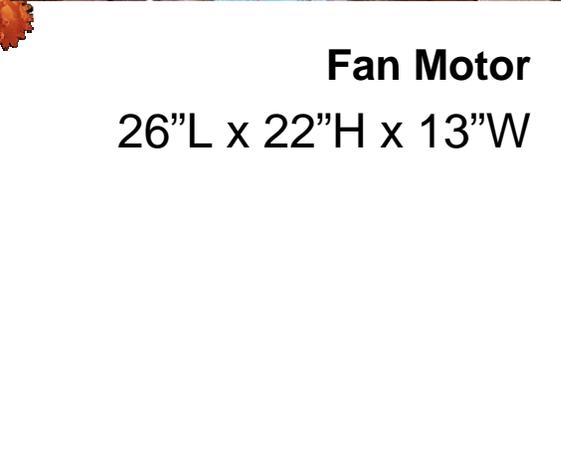




# Joy Mist Drilling System



Heat  
Exchanger



Fan Motor  
26"L x 22"H x 13"W





# Joy Mist Drilling System



**Water Tank:**  
**30 gal**  
40"L x 16"Dia.

**30 gal tank for onboard  
water supply.**

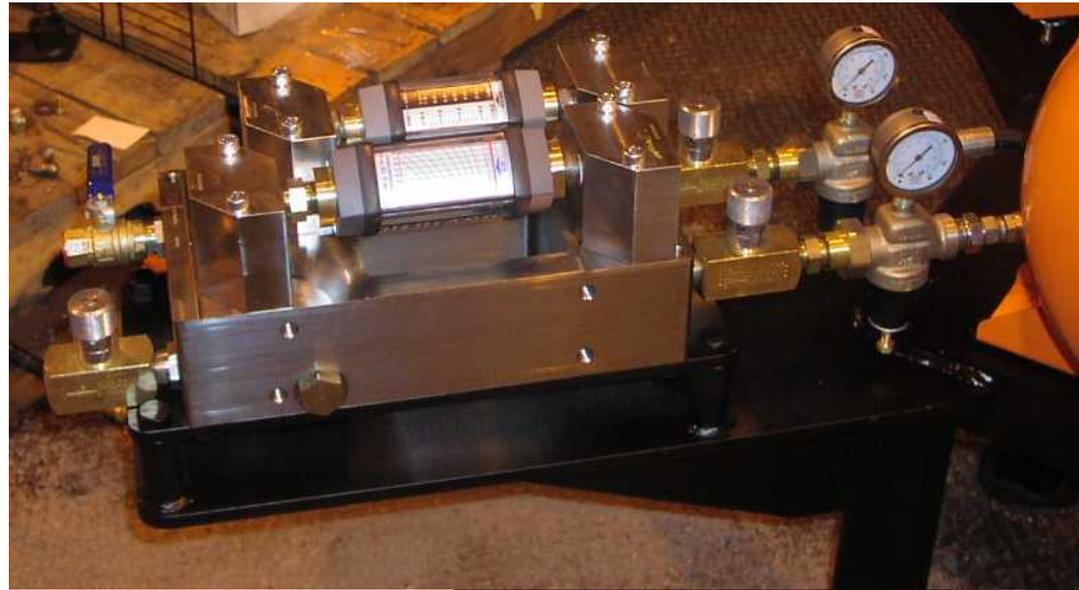
**Experimentation with  
other options**

- Accumulator
- Reservoir





# Joy Mist Drilling System



Mist  
Block

16"L x 10"H x 8.5"W





# Joy Mist Drilling System



## Rotation units

- Use Wet Type
- Customer Supplied
- Positive Seal Required

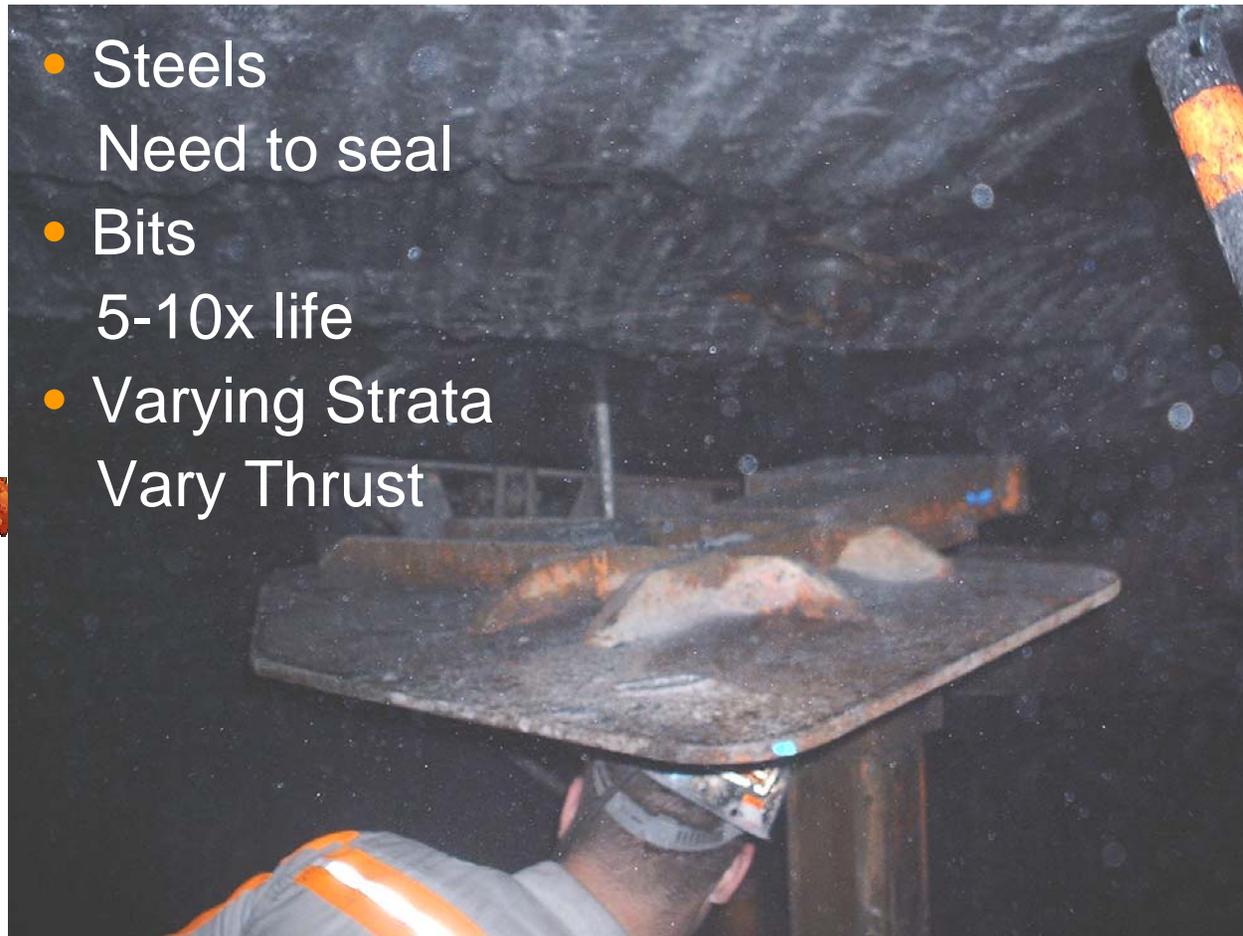




# Joy Mist Drilling System

Lessons from first trial:

- Steels  
Need to seal
- Bits  
5-10x life
- Varying Strata  
Vary Thrust

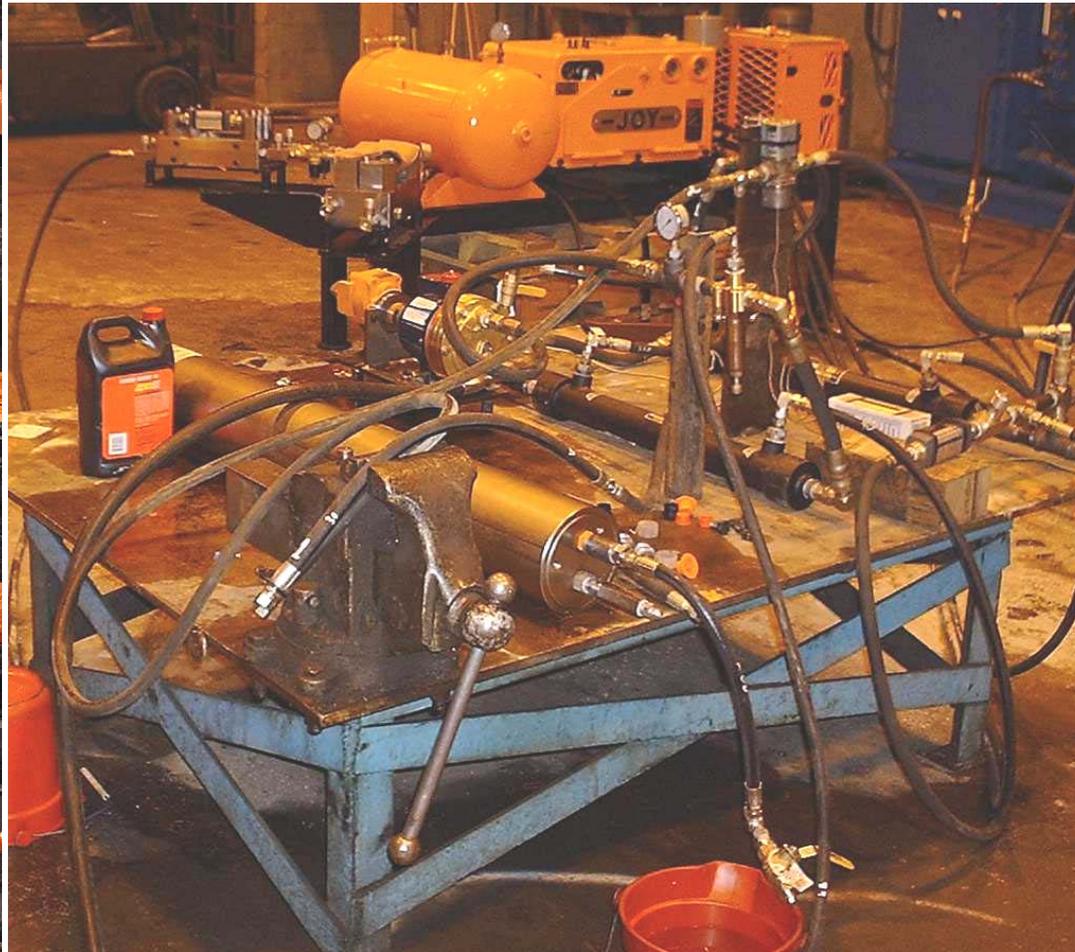




# Joy Mist Drilling System

## Options

- Reservoir with Pump
- Accumulator
- Pilot mist valve
- Water cooled w/ over temp shutdown





# Joy Mist Drilling System

System installed above ground with reservoir





# Joy Mist Drilling System

## 2<sup>nd</sup> Trial

- No Tank - 700 psi water supply
- From Wet to Mist
- Floor dried up

- Operators happy
- Mine management happy
- Trial system purchased

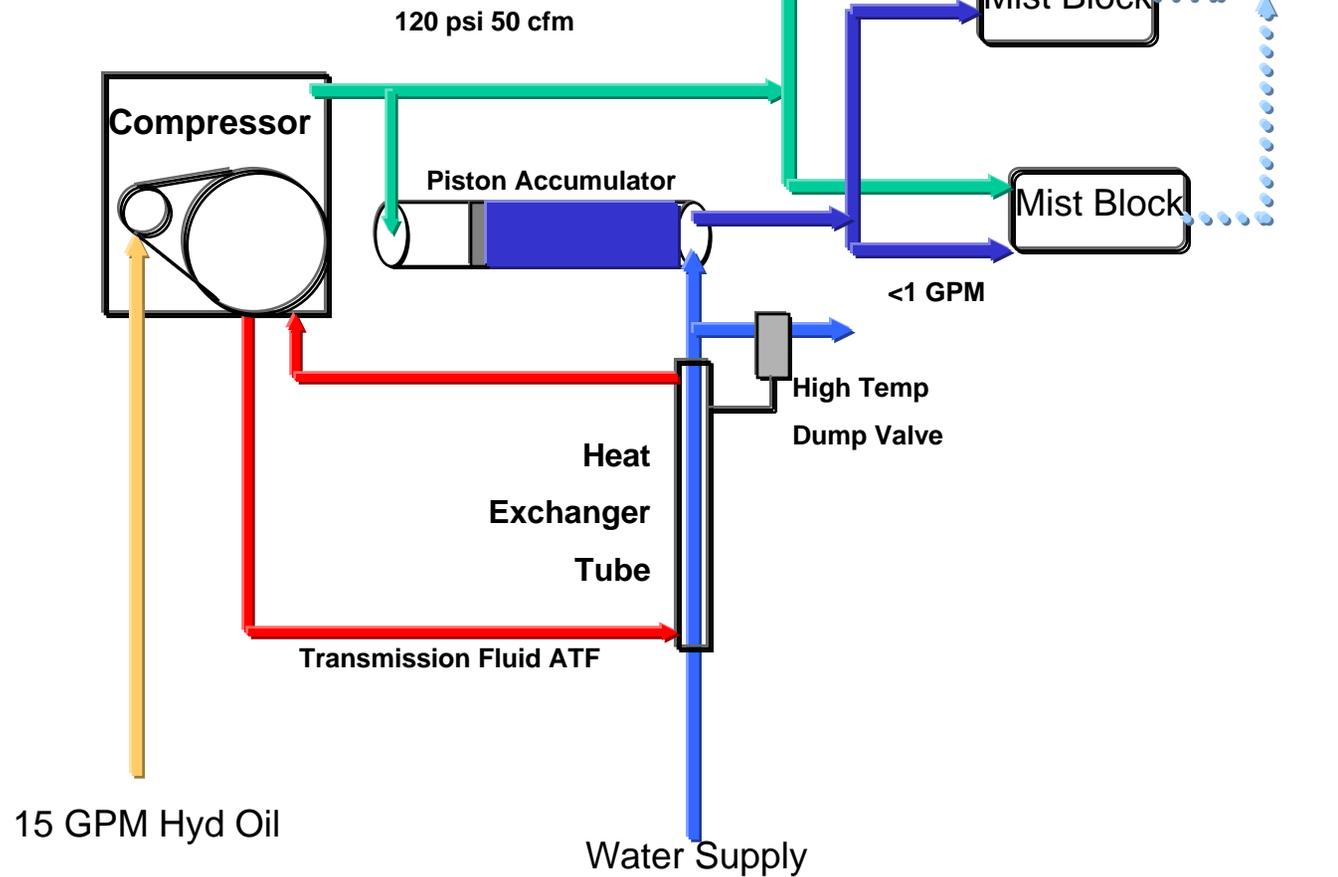




# Joy Mist Drilling System

## Miner-Bolter Configuration

### Water Cooled





# Joy Mist Drilling System

## Miner-Bolter Configuration Installation





# Mist Drilling Advantages

- Wet Drilling

- Reduction in water consumption by up to 90%.
- Improved operator environment
- Improved floor and roof conditions
- Reduced moisture content in coal

- Dry Drilling

- Reduced noise levels
- Improved bit life saves time and \$\$
- Improved penetration rates (depends on bit and roof conditions)
- Reduction in respirable dust
- Cleaner holes
- Reduces impact of moisture in overlying strata
- Reduced maintenance
- Fewer components

