International Mining Health and Safety Conference

*Charleston Civic Center, Charleston, West Virginia*

*April 7, 2011*

WHEELING JESUIT UNIVERSITY

# MSHA Mine Emergency Operations

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*MSHA, Pittsburgh, Pennsylvania, USA*

# MSHA Mine Emergency Operations

## Current Coal Mine Emergency Unit information

- Fully Equipped Mine Rescue Stations for Coal are Maintained in Pittsburgh, Beckley, and Price

- The Coal Unit is Comprised of About 30 Members who Practice Four Days each Quarter.

## Current Metal and Non-Metal Mine Rescue Team Information

- Mine Rescue Station is located in Beckley

# MSHA Mine Emergency Operations

## Mine Rescue Team Trucks Located in Beckley and Price

**Trucks Contain Support Equipment for the Mine Emergency Unit**

# MSHA Mine Emergency Operations

## Pittsburgh Station – National Headquarters

**New Command Vehicle – State of the Art Communications**

*90% Complete, Operational*

# MSHA Mine Emergency Operations

## Pittsburgh Station – National Headquarters

**Mobile Monitoring Vehicle**

**Infra-red Detectors**

# MSHA Mine Emergency Operations

## Pittsburgh Station – National Headquarters

**Mobile Laboratory**

**Chromatographs**

# MSHA Mine Emergency Operations

## Pittsburgh Station – National Headquarters

**Seismic Location System**

*Upgrades Underway*

# MSHA Mine Emergency Operations

## Pittsburgh Station – National Headquarters

**Borehole Camera System**

# MSHA Mine Emergency Operations

## Pittsburgh Station – National Headquarters

**Modified (Permissible) Remotec Andros Wolverine Robot**

# MSHA Mine Emergency Operations

## Beckley Station

**PEIR Communication Vehicle**

# MSHA Mine Emergency Operations

## Beckley Station

**Urban Search and Rescue / Field Office Trailer**

# MSHA Mine Emergency Operations

## Price Station / Denver Office

**Command Center**

# MSHA Mine Emergency Operations

## Price Station / Denver Office

**Mobile Monitoring Vehicle**

**Under Construction**

**Infra-red Detectors**

# MSHA Mine Emergency Operations

## Price Station / Denver Office

**PEIR Communication Vehicle**

**Trailer Under Construction, 50% Complete**

# MSHA Mine Emergency Operations

## WHAT ELSE?

1. ***Specialized Equipment***
2. ***Training***
3. ***Experience***

# What is MSHA looking for?

- Information from underground
- Gas readings

# *By the Numbers*

## free and Oxygen

end Upwards

CO AIRF

OXYGEN (percent)

0
10
20
30
40

2
3
4
5
6
7
8
9
10

4/2/99 0:00
4/4/99 0:00
4/6/99 0:00
4/8/99 0:00
4/10/99 0:00
4/12/99 0:00
4/14/99 0:00
4/16/99 0:00
4/18/99 0:00

Date & Time

CO Airfree

# Gas Readings

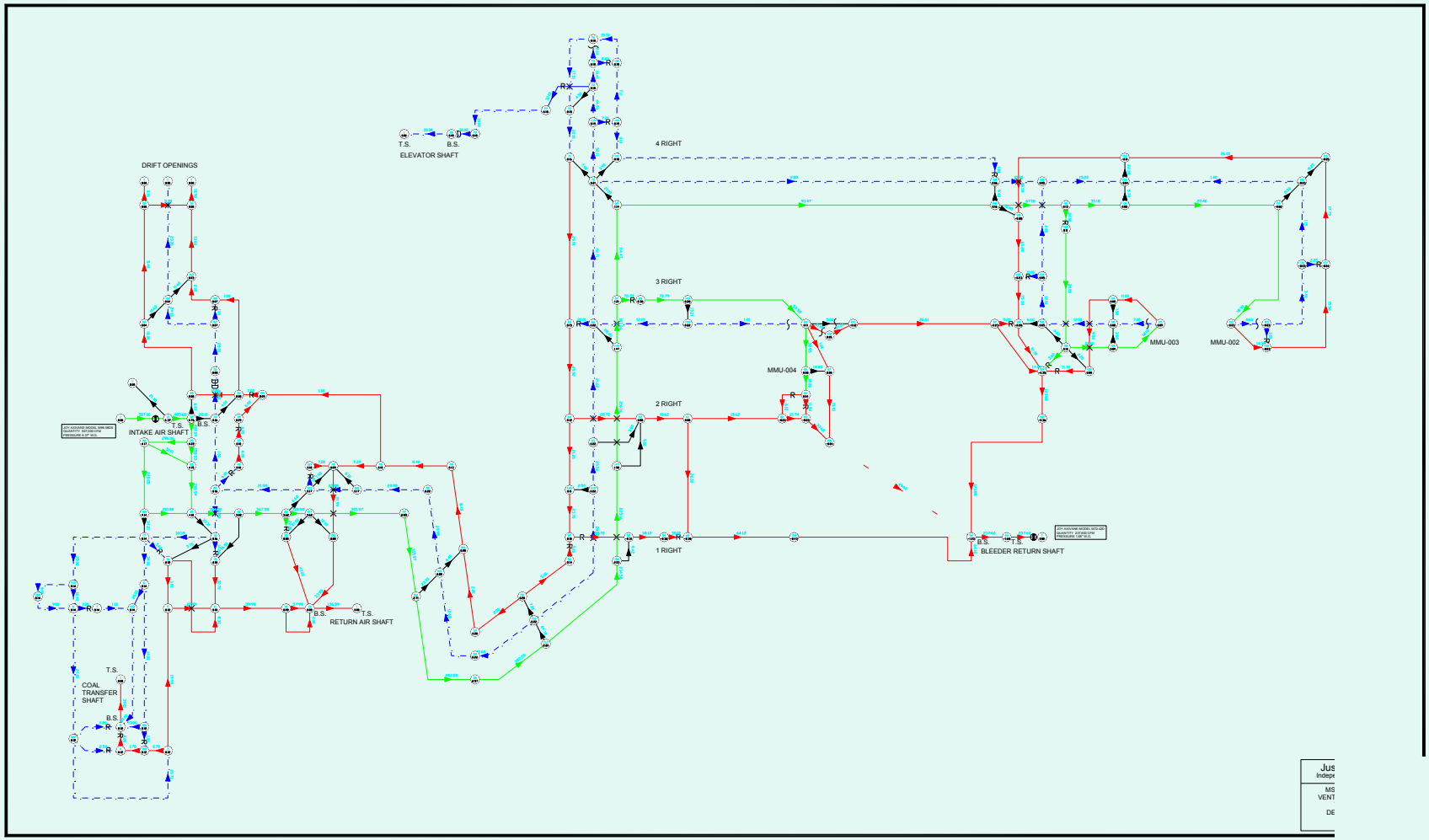
- In General;
  - An upward trend in methane or carbon monoxide is not positive.
  - Higher than normal concentrations of methane must be explained.
  - A stable trend may be positive
  - A downward trend may be positive

# Thoughts

- If all personnel are safely withdrawn from the mine:
  - Wait 72 hours
- If the mine or a portion of the mine is sealed:
  - Wait 100 days

# DO NOT CHANGE VENTILATION

WITHOUT KNOWING THE FULL SITUATION AND BEING ABLE TO TAKE ONE STEP BACK



# *Know your Options*

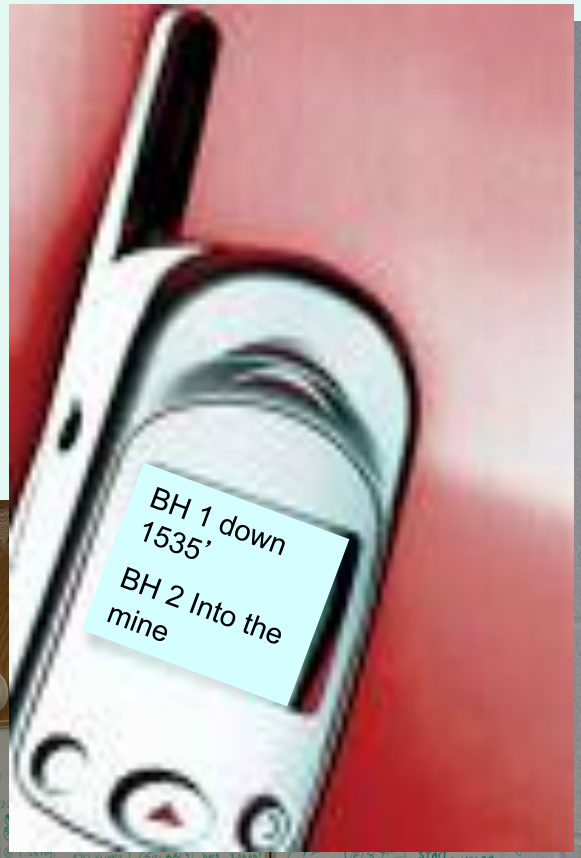
Look at the Numbers.

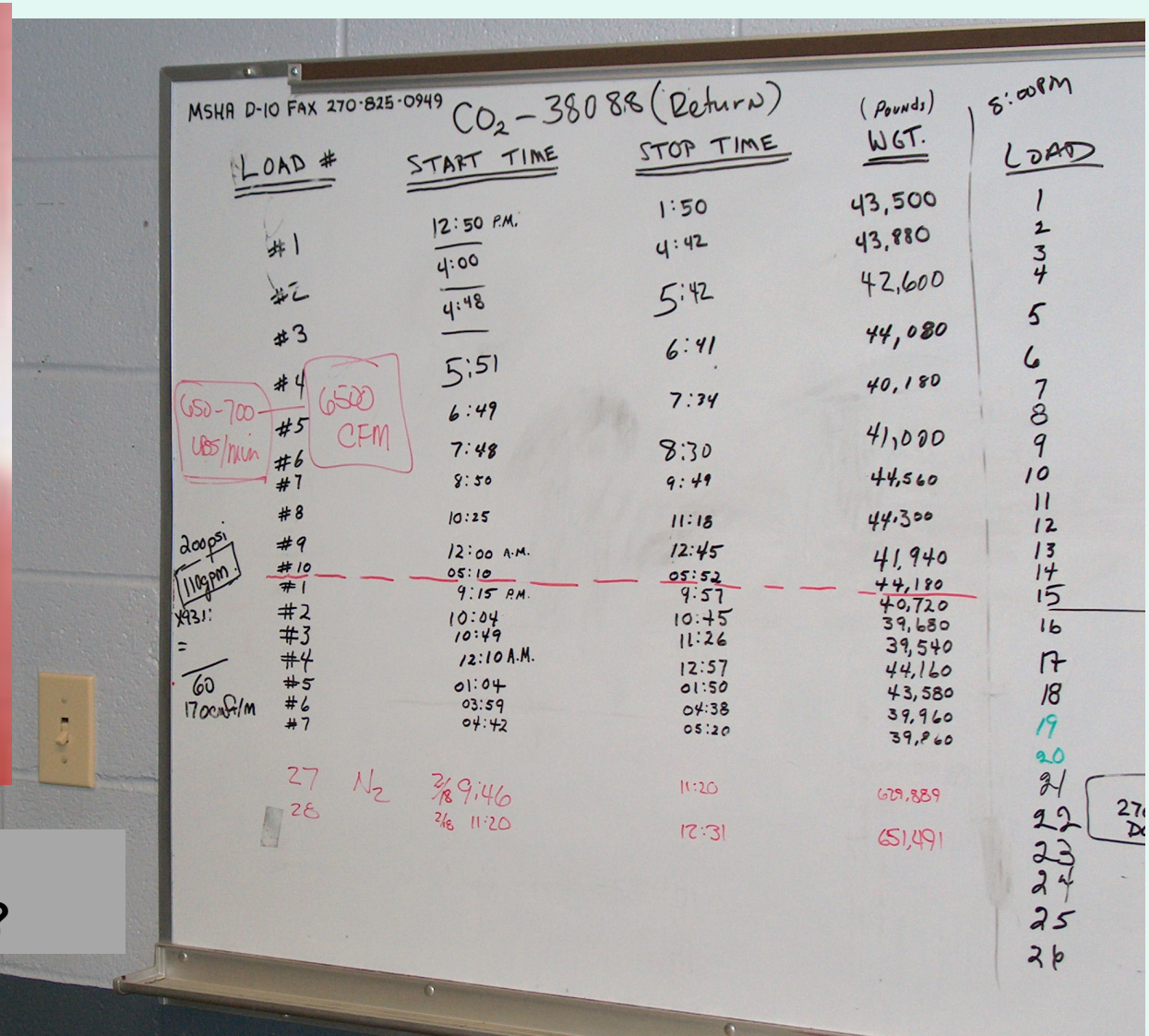
If it is too dangerous for Mine Rescue Teams, explore other options.

U.S. Department of Labor
MSHA
Mine Safety and Health Administration
Start Drilling!!!
96 Hours

# Establishing a Command Center

Distribute the information




**WHO IS IN YOUR COMMAND CENTER?**

**Family Members are Brought in to Observe Drilling Operations**

# Media

**From the local newspaper…**

# Cameras and Robotics

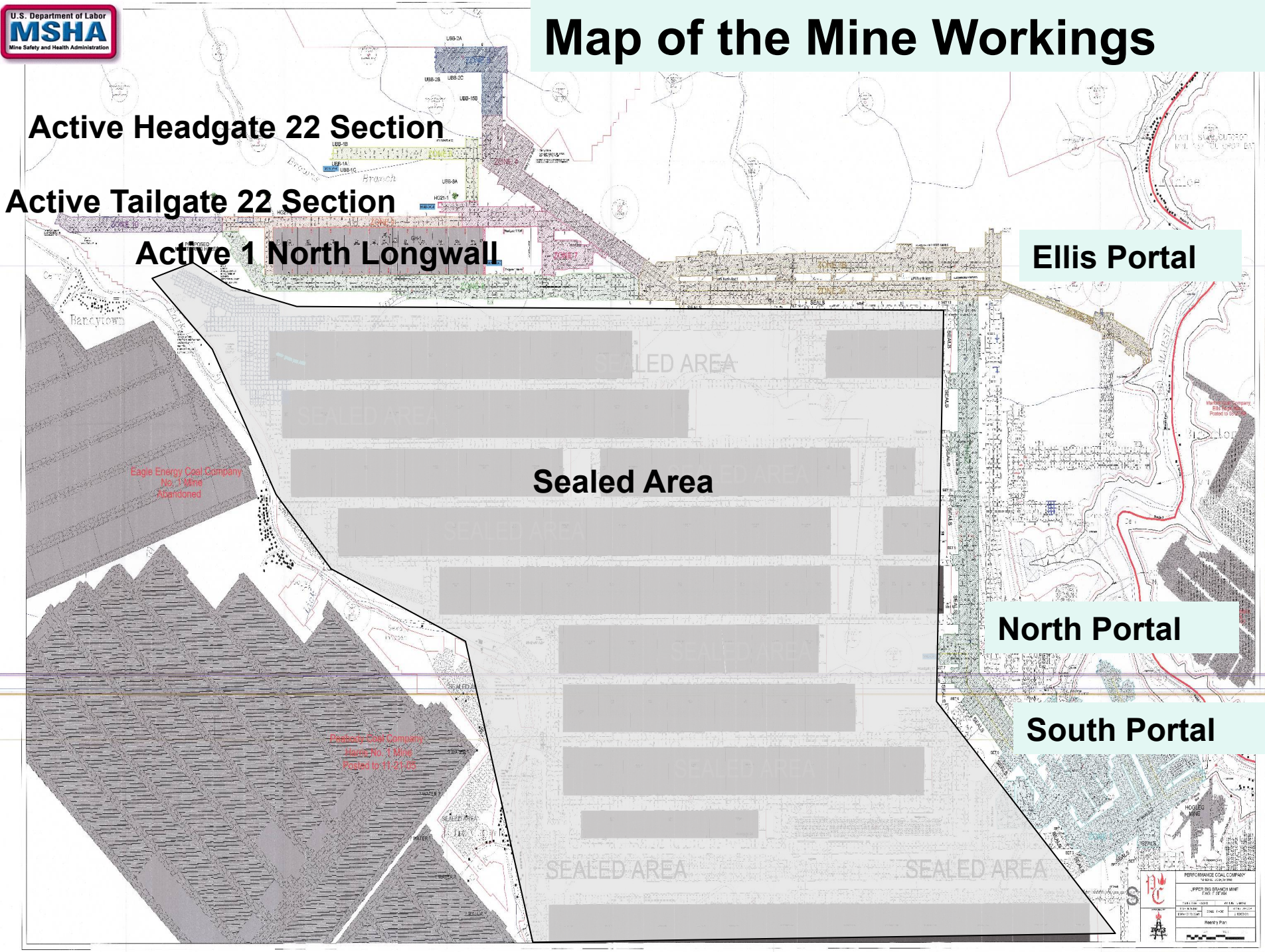
Cameras have been used in mine emergency responses for a number of years.

Remote Plugs were Installed
Using this Equipment.

# Upper Big Branch Mine

## April 5, 2010

# Map of the Mine Workings



# A Joint Collaborative Effort Between MSHA and NIOSH

- **Purpose : To develop a Mine Rescue Team Vehicle (aka Mule)**
- **Anticipated Timeframe: 18 to 24 months**
- **Scope of Work: Includes Prototype Construction and an Evaluation Period**

# Mine Rescue Vehicle Requirements

- Transportable by MEO
- Rugged
- Possible Trailer
- 4 wheel drive or cats
- Holds 5??
- Diesel?
- 4 to 5 feet High
- Less than 8 feet wide
- Minimal Frills

# 2007 National Mine Rescue Association

## Fatal Underground Coal Mine Explosion

## January 2, 2006

## Sago Mine
## Wolf Run Mining Company

***Sketches are for demonstrative purposes only and are not exact replications***

# Exploration

- Must be accomplished quickly
- Multiple Entries
- Working with Communications and Tracking to develop a system to track teams and provide direct communications to the command center with team members exploring separate entries.

# Pike River Mine Explosion

**Gas Explosion in the Pike River Coal Mine**
**Friday November 19th, 2010 – 1530 hours**

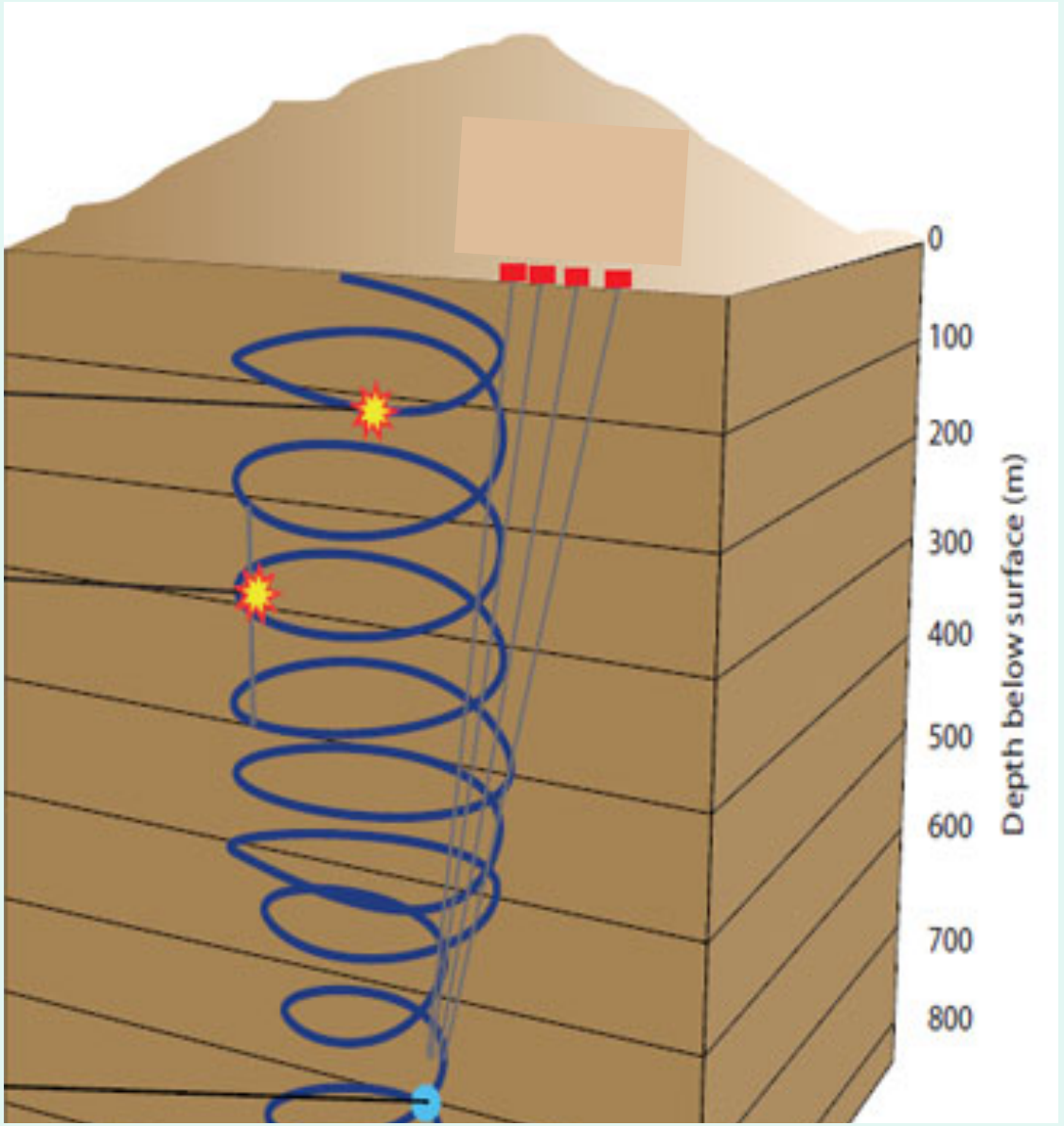
# Robotics

- When it is unsafe to enter, do we have the expertise to enter a mine with robotics\
- Current MSHA approved robot limited to 3000 feet.
- Need to develop capability to travel 5 miles

**The San Jose Mine is a Copper/Gold mine located near the town of Copiapo, Chile**

Note: Photos courtesy of AP, Reuters, ABC, and other Internet Sources

On Aug 5, there was a massive collapse that blocked all access below the 300 meter level.




33 miners were working below that level. All communications were cut-off.

# Rescue Boreholes

- Meeting with manufacturers and drillers to discuss preparedness
- Availability of equipment
- Expertise
- Cameras, communications, supplies, air