

# Trapped Miners Now Have Chance For Survival!

## Mine Escape Planning & Emergency Shelters Workshop

National Academy of Sciences

Washington, DC

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[www.ChemBioShelter.com](http://www.ChemBioShelter.com)





**Life Shelter**<sup>TM</sup>

## ...Saving The Lives of Trapped Miners

ChemBio *Life Shelter*<sup>TM</sup> - the most reliable, economical and technologically advanced way of providing a "Safe Haven".





## **NEWS: ChemBio Shelter Partners With Industry Leading Emergency Shelter Manufacturer**

- Zumro, Inc., Hatboro, PA
- 18 Years Experience
- Rugged Materials
- Soft-sided Construction
- Rapid, Air-Beam Deployment
- Design Flexibility

*Rugged*

*Soft-Sided*



*Air-Beam Deployed*



*Design Flexibility*



## **NEWS: DoD Selects Allentown, PA Company For Assessment of Chemical, Biological and Radiological Protection System**

- **Joint Program Executive Office for Chemical and Biological Defense (JPEO-CBD)**
- **December 2005 – Extensive 5-day Test**
- **Collective Protection for Troops**
- **Simulated Chemical Agent Attack**
- **Flame Retardant**
- **Maintained Life-sustaining Environment**
- **Decontamination Unit**
- **Toxic Free Entry and Exit**



**Portable Atmospheric Control Unit**

**Air Lock**



**Water Lock**





**NEWS:** *ChemBio Shelter Demonstrates  
Emergency Life Shelter at  
Bruceton Experimental Coal Mine*

*February 8, 2006*





# The Mine Rescue Need

Ensuring miners have a life-sustaining air supply...

- When,
- Where, and for
- How Long they need it!





# The Need: When

## Mine Emergency Situations

- Explosion
- Fire
- Collapse
- Contaminated Air

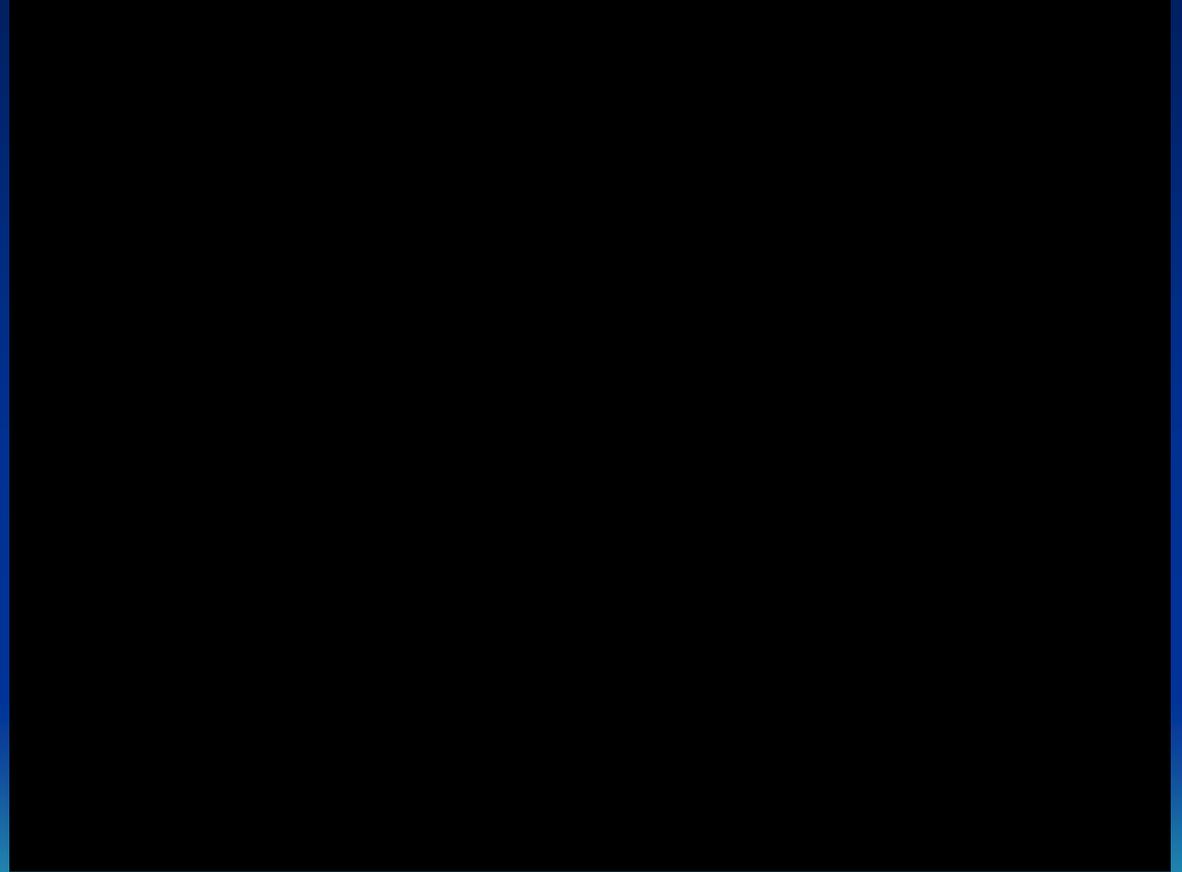
## Miners Unable To Exit Mine





## The Solution: Life Shelter<sup>TM</sup>

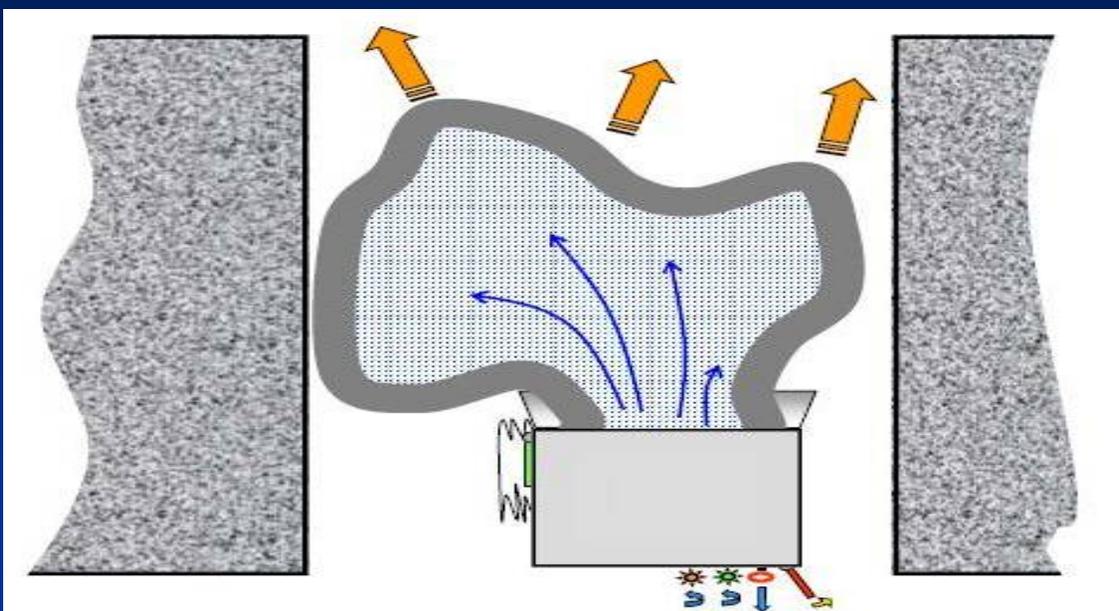
- Rapid Deployment  
(Less than 60 seconds)





## The Solution: Life Shelter<sup>TM</sup>

- Ease of Operation
- Durability
  - Flame Retardant (meets UL94-V0)
  - Puncture & Tear Resistant
- Availability



### Deployment Sequence

1. Open Panel & Pull Release
2. Open Valve 1  
(deploy & fills shelter with fresh air)
3. Open Valve 2  
(lifts shelter to available height automatically)



## The Need: Where

- Low seam / high seam
- Accessible by all workers
- Within 1000 feet of active workings
- Inby / Outby placement





## The Solution: Life Shelter<sup>TM</sup>

### Mobile

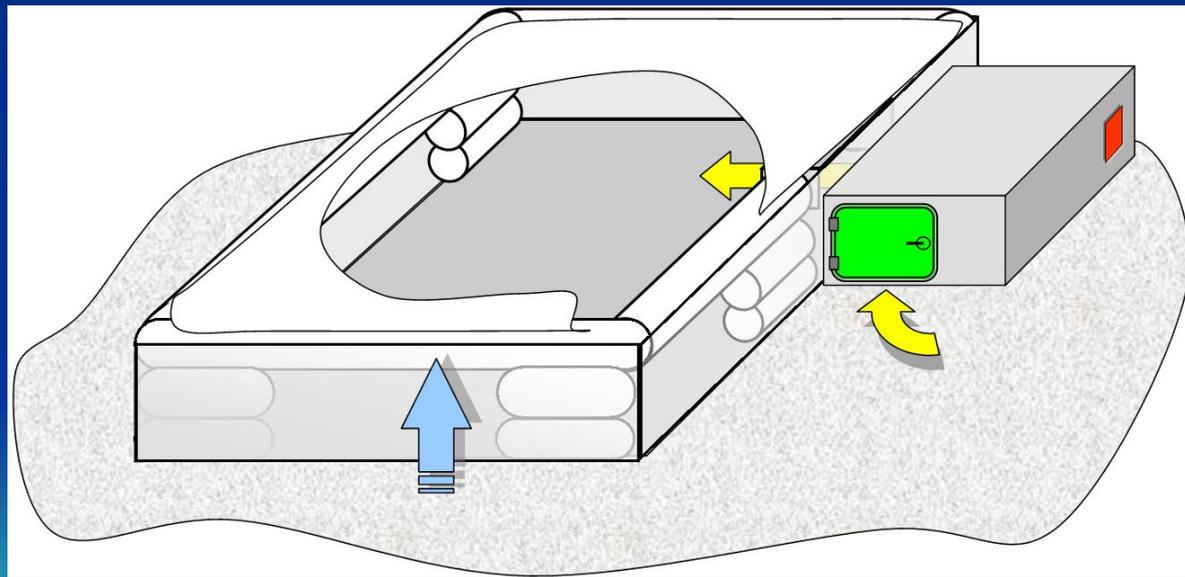
- Skid Mounted

### Capacity

- Up to 18 workers

### Sizes

- 20" to 36"
- 36" to 60"
- 84"
- Custom





# The Need: How Long

## Duration of Emergency

- Contaminated Mine Air
- Rescue Team Arrives

## Shelter Design

- Duration of life-sustaining air supply
  - Monitoring air
  - Power requirements
- Shelf-life of equipment & supplies





## The Solution: Life Shelter<sup>TM</sup>

### Life-sustaining air supply

- 96 hours of protection (or more)
- No external power required
- Air-lock entry system
- Positive pressure

### Shelf-life: Equipment

- Shelter ( 20 yrs)
- Monitors (2 yrs)

### Shelf-life: Supplies

- Oxygen candles (10 yrs)
- CO<sub>2</sub> scrubbing (5 yrs)
- CO scrubbing (10 yrs)
- Activated carbon filter (5 yrs)





# Life Shelter™ Standard Package

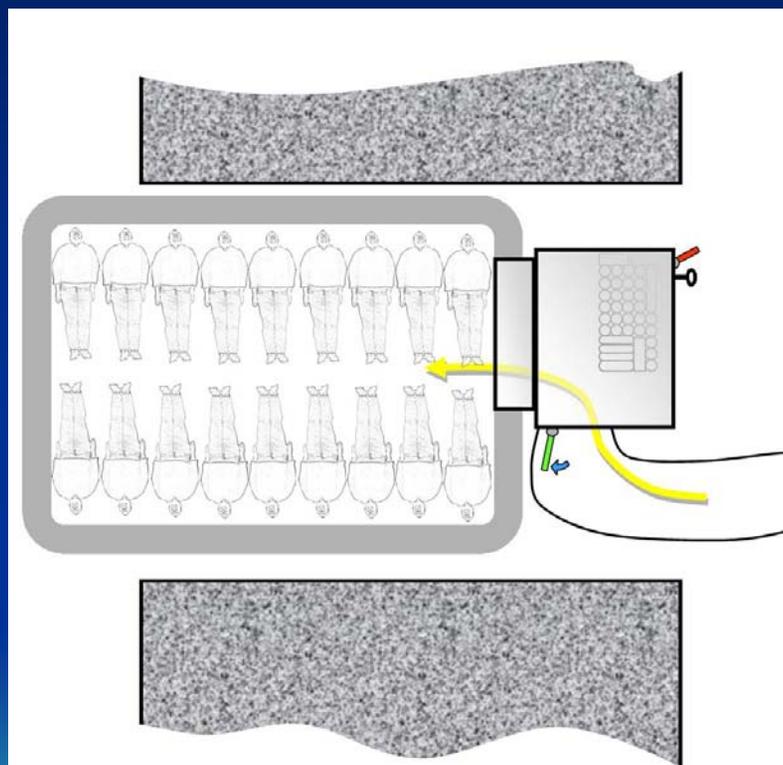
## Air-beam deployed, hermetically sealed shelter

- Protects up to 18 people
- Easily stored and moved
- Rapidly deployed
- Air lock for safe entry
- Field repair kit
- Emergency lighting

## Air-processing system

(operates without external power)

- Oxygen reactor
- CO<sub>2</sub> scrubber
- CO scrubber



### Entry Sequence

1. Open Side Door
2. Enter Thru Air-lock Sleeve



# Life Shelter™ Standard Package

## Monitors

- Oxygen, CO, CO<sub>2</sub> & temperature
- Intrinsically safe
- Inside / outside monitoring

## Consumables

- Oxygen reactor cartridges
- CO<sub>2</sub> absorbent
- Activated carbon filters
- Emergency medical supply kit
- Pre-packaged Meals
- Potable Water
- Chemical Toilet Packs

CO<sub>2</sub> Monitor



CO Monitor



Oxygen Monitor





## Summary

- Long Term Air Supply
- Mobile
- Rapid Deployment
- Air Processing without Electrical Power
- Tough Material and Storage Cart
- Standard and Custom Sizes
- Availability





*Life Shelter™*

...Protecting You In An Uncertain World.

Thank You  
For Your  
Interest!



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