

# 2017 SWRMRA Mine Rescue Contest

JUDGES PACKET  
Field Competition  
Day 2



April 5, 2017  
Carlsbad, New Mexico

**Day 2 Mine Information**  
**Carlsbad, NM**  
**April 3-6, 2017**

**General**

The KCI Mine is an underground single level room and pillar Potash mine owned and operated by Hopkins & Associates Mining Company. Sam Hopkins is VP of Operations and Mark Bratcher is currently the mine manager. The KCI mine is located in Southeast New Mexico approximately 50 miles south of Carlsbad. The mine is active and operating at full capacity. The only known issue is an aquafer that allows water to free flow into the west side of the mine. This water is controlled by sump storage and water lines that pump the water to surface. The mine operates two 12 hours shifts per day, 6 days a week. Hours of operation are from 5 am to 5 pm on day shift and 5 pm to 5 am on nights.

**Mine Access**

Mine access is provided by two 14 foot diameter concrete-lined shafts. The two 14 foot shafts are known as the #1 Intake shaft and the #2 Exhaust shaft. The working areas of the mine are 10 feet by 10 feet and pillar sizes are 20 feet by 20 feet.

**Explosives**

No explosives are used or stored on mine site.

**Electricity**

Electrical service to the mine is provided by a local electric company. The main disconnect for all power to the underground is located on the surface. All face equipment in the mine is permissible. Power centers are located underground for mining equipment.

**Gas**

Non-Gassy classification

**Communication**

This is accomplished by two-way radios that are carried by mine personnel.

**Ground Control**

Ground control is maintained with 5 foot mechanical bolts and timbers are located in the mine for secondary support.

**Materials**

All materials to work the problem are located underground or on the surface.

**Mining Methods**

Room and pillar method is accomplished by continuous mining machines.

### **Mine Maps**

The mine maps were last updated on December 1, 2016.

### **Mine Equipment**

The mine currently utilizes continuous miners, fletcher bolters, diesel scoops and diesel cars to transport material.

### **Ventilation**

The mine is ventilated by a non-reversible 100,000 cfm fan that is located on surface. The mine utilizes a blowing system; ventilation enters the mine via the #1 Intake shaft and exits the mine via the #2 exhaust shaft.

### **Water**

Water flows into the mine from an underground aquifer and is collected at a sump that's located in the west side of the mine.

### **Notification**

All federal, state and local officials have been notified.

### **Backup Teams**

Two other trained and fully equipped mine rescue teams are on site.

# Day 2 TEAM BRIEFING

Carlsbad, NM

April 3-6, 2017

You have arrived at the KCI Mine, the mine Manager Mark Bratcher has received the following information about today's events. Seven miners tagged in for work this evening around 5 pm, they were assigned to work in the North West side of the mine. They were tasked to relocate a power center and reestablish power for mining into a new area of the mine.

At approximately 10:00 pm the Hoistman was notified via radio to call someone from management and inform them that an accident occurred underground. He was also told to notify the local EMS service to get them on their way. The Hoistman did not ask the caller what type of accident took place nor did he ask how many miners were injured.

At approximately 10:30 pm two miners arrived on surface by way of the intake shaft and were both taken to the local hospital for further evaluation. One miner stated that smoke was building up in the mine. At approximately 11:15 pm one miner carrying his foreman exited the intake shaft cage and both of those miners were taken in for further evaluation. We have not been able to gather any more information at this time.

It is now 2:00 am and you will be the first team to enter the mine, we will provide any information that is gathered once management can speak to the injured miners. The fan is being guarded and is in the off position. Your backup teams are on site and will be available to support your team if necessary.

If you are ready and willing, the service of your mine rescue team is needed. Your objectives are listed below and the mine manager will be available at the fresh air base for any questions or requests. GOOD LUCK!

## **Field Problem Objectives:**

- Explore all accessible areas of the mine
- Extinguish or seal all fires
- Locate all missing miners
- Bring all survivors to the surface

# Team Map Day 2

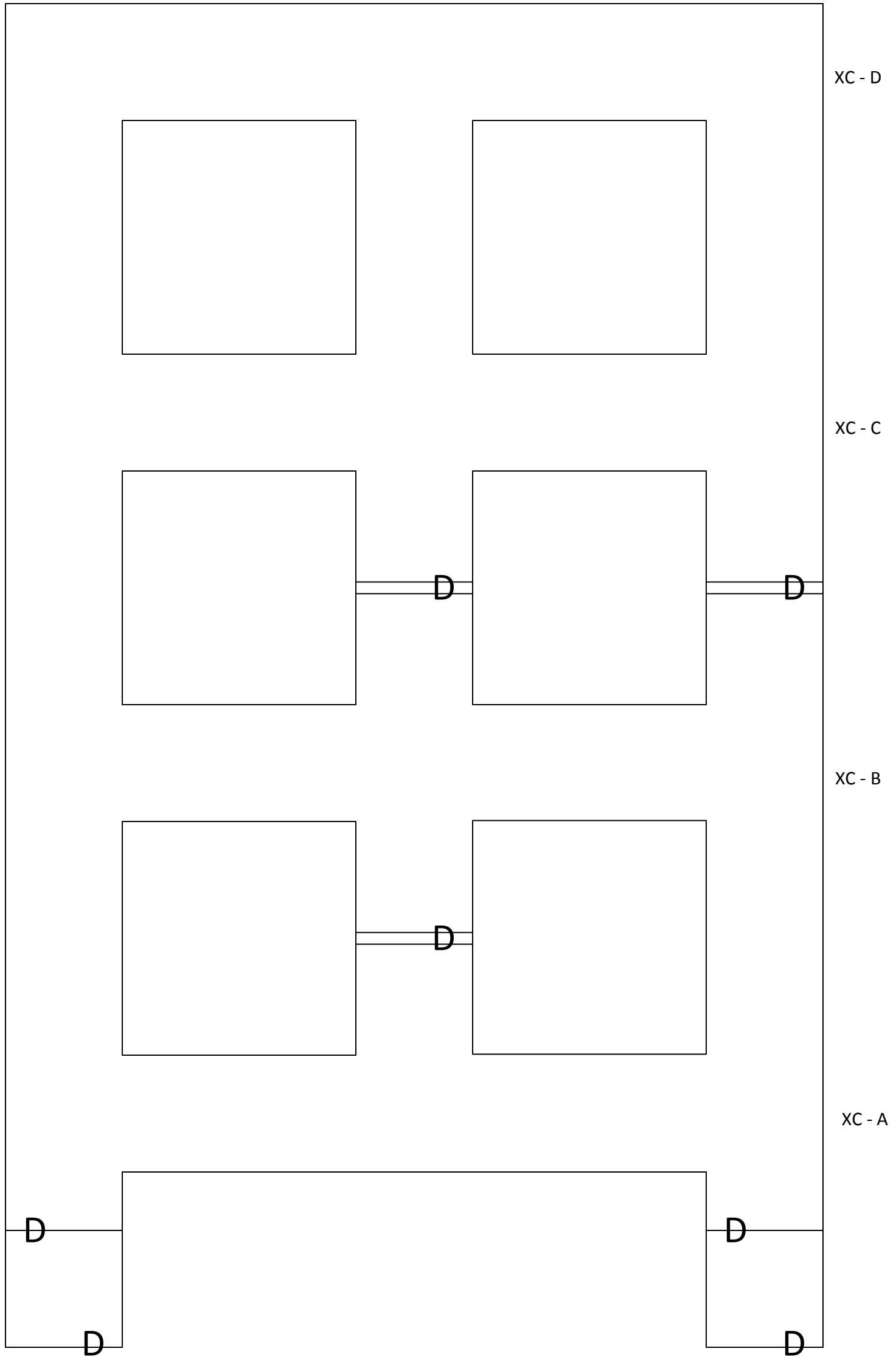
Team Name: \_\_\_\_\_

Team Draw # \_\_\_\_\_

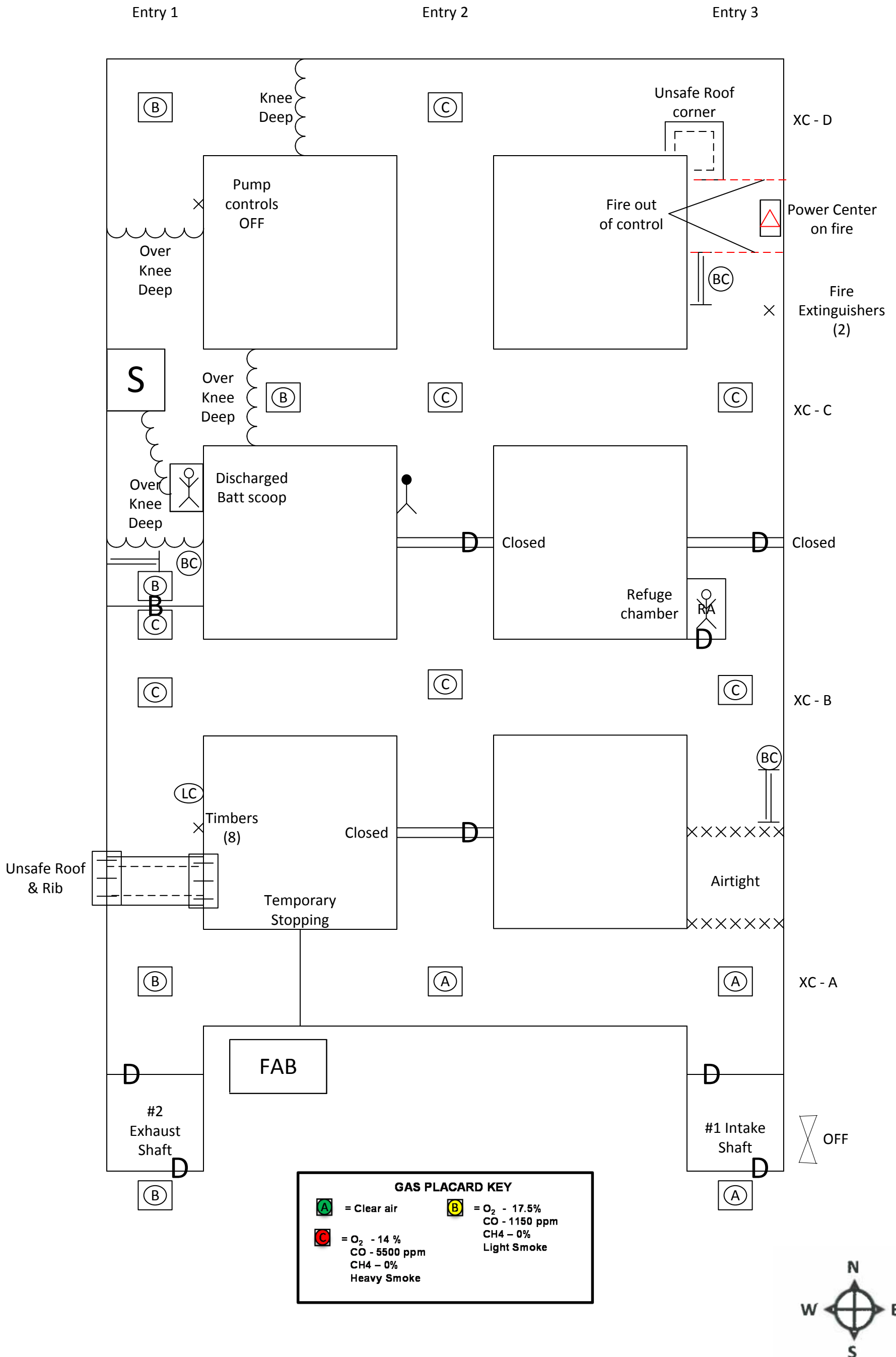
Entry 1

Entry 2

Entry 3



# Problem Map



## **Field Problem Solution Day #2**

**(See Solution Maps)**

### **FAB**

The teams will arrive at the FAB and have introductions, the team will also be informed that they will be able to string out their communication line but will not be able to check functionality until they have started the clock. Once the clock has been started the team will receive all of their maps and information.

### **Team Stop #1**

Teams will explore the #2 Exhaust Shaft, checking the shaft and cage they find no issues and identify "Light Smoke".

### **Team Stop #2**

Teams will travel to the "#1 Intake Shaft", examining this shaft and cage the team will find no issues and identify a "Clear Air" placard. The team will elect to enter the mine through the #1 Intake Shaft.

### **Team Stop #3**

The team will count of entering the mine and continue north in entry #3 until they reach the intersection of XC-A. The team will identify a "Clear Air" placard and "Caved Airtight" the team will most likely conduct their 50' check in this location as well.

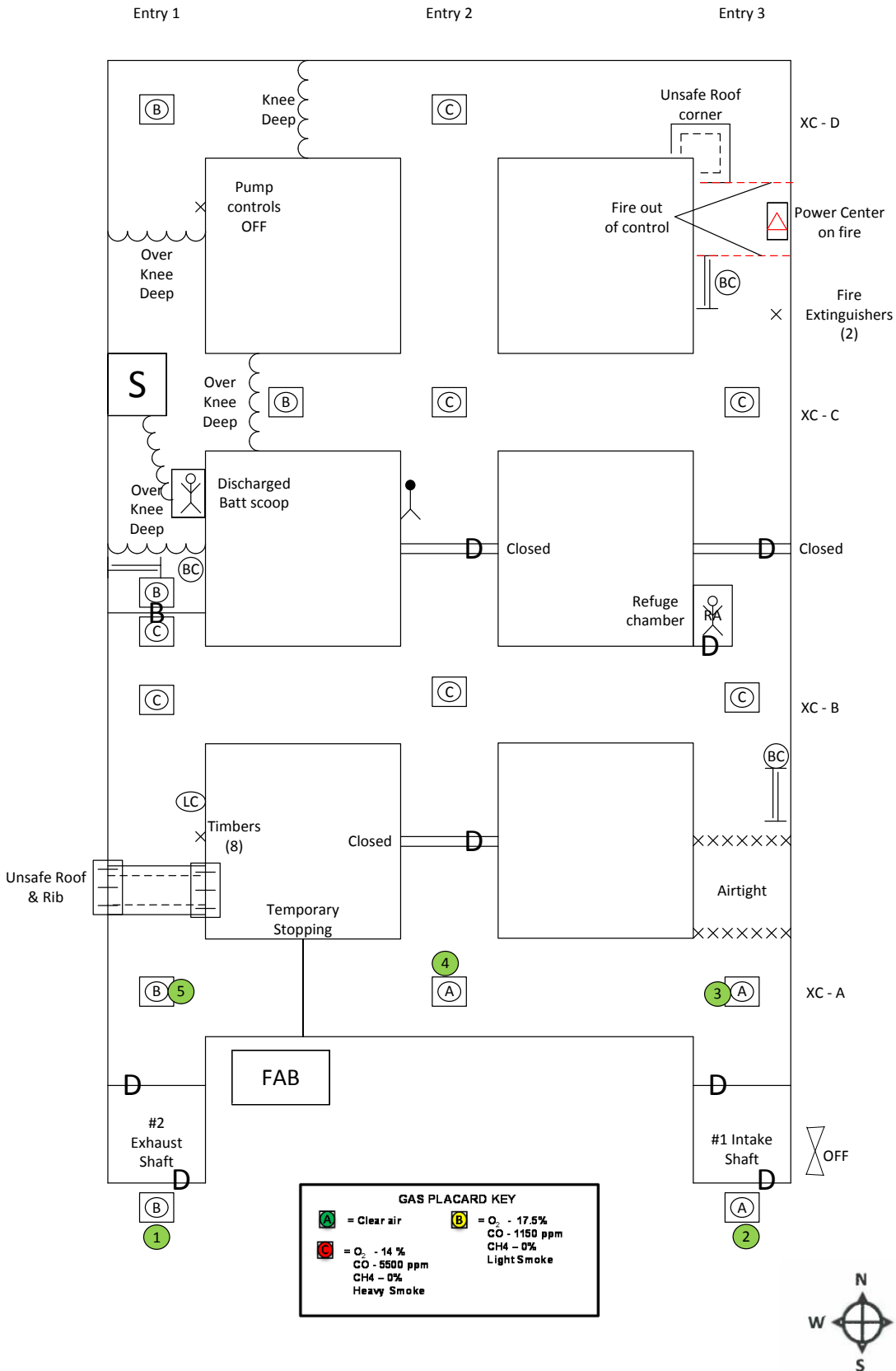
### **Team Stop #4**

The team will continue exploration west in XC-A until they reach the intersection of entry #2. The team will identify a "Clear Air" placard. Stretching into entry #2 the team will identify "Permanent Stopping (door closed)", stretching west the team will find a "Temporary Stopping". This will be their furthest point of advance in this location.

### **Team Stop #5**

The team will retreat out of the mine and enter the mine by way of the #2 Exhaust Shaft. Exploring north in entry #1 the team will identify a "Light Smoke" placard in the intersection. Stretching north the team will identify "Unsafe Roof & Rib" and will not have the means to support this area at this time. Stretching east in the team will find the backside of the temporary stopping and since they know the conditions on both sides they will take down the temporary stopping and continue exploration.

# Problem Map





### **Team Stop #6**

Due to not knowing the conditions behind the closed door in entry #2, it will be necessary for the team to construct an “Air Lock” to enter the door. The team will continue exploration north in entry #3 until they reach the intersection. The team will identify a “Heavy Smoke” placard. Stretching north the team will identify a “Permanent Stopping (door closed)”.

### **Team Stop #7**

The team will explore west in XC-B until they reach the intersection of entry #1, the team will identify “Light Smoke”. Stretching north in entry #1 the team will identify a “Barricade” if the team knocks on the barricade they will hear the shouts of a missing miner (Jim) informing them to get him out. If the team does not address the Barricade then they will explore south until they identify the other side of the Unsafe Roof & Rib. The team will also identify a “Line Curtain” and “Timbers (8).

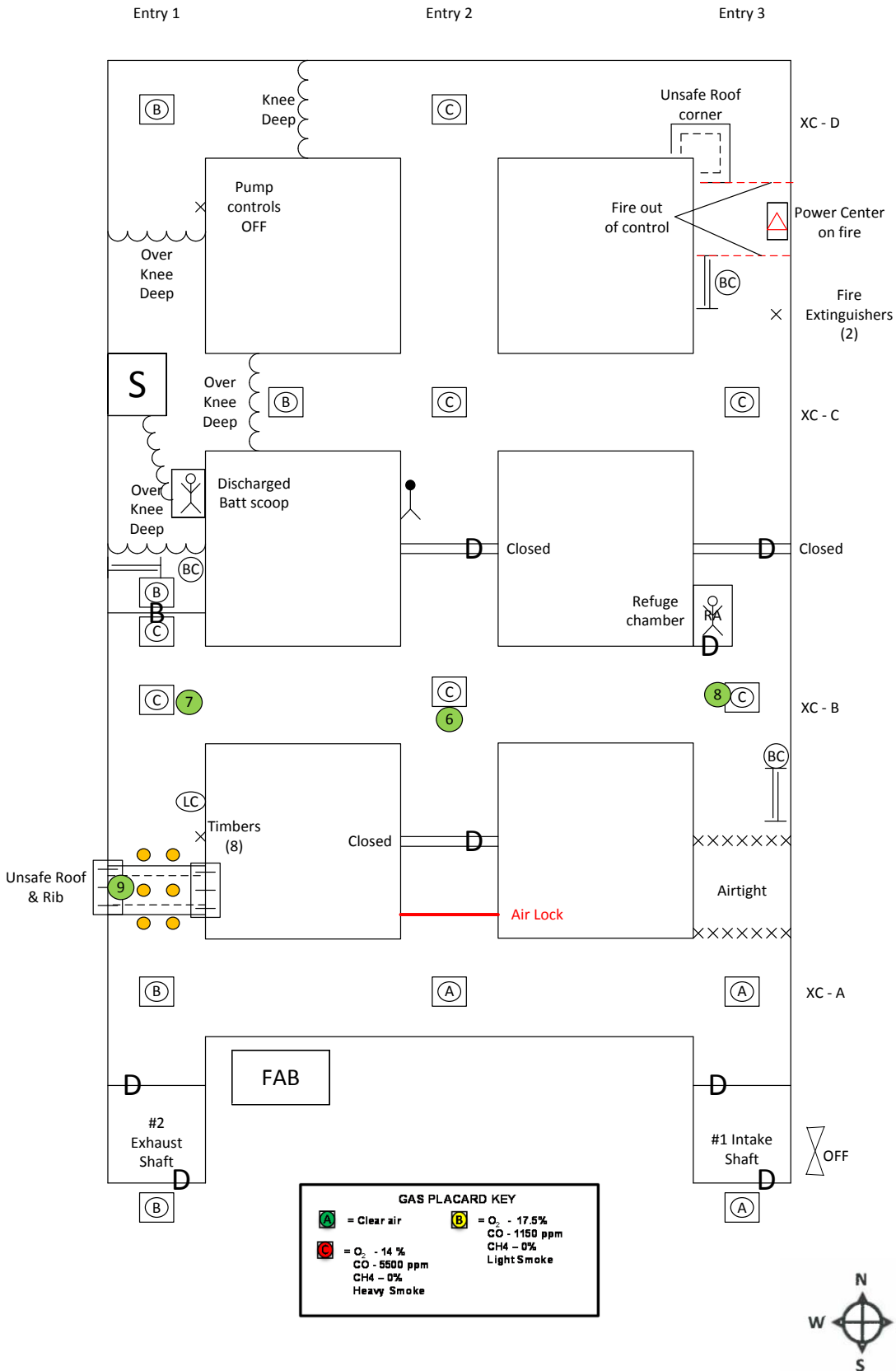
### **Team Stop #8**

The team will continue exploration east in XC-B until they reach the intersection of entry #3 where they find that they have remained in “Heavy Smoke”. Stretching south they find “Building Materials (1 set)” and the back side of the Caved Airtight. Stretching north the team will find a “Refuge Chamber” and a “Permanent Stopping (door closed)”. Knocking on the door of the refuge chamber they make verbal contact with Drew and he will provide the following statement. “Get me out of here, I’m not injured and the air in here is good. I’m completely enclosed”.

### **Team Stop #9**

The team will have the means to execute Ventilation change #1. Since there is still one miner unaccounted for the team will need to support the unsafe area prior to making the ventilation change. The team will retreat to the unsafe area in entry #1 and utilizing dual supports, it will be necessary to utilize 8 timbers to support the area.

# Problem Map



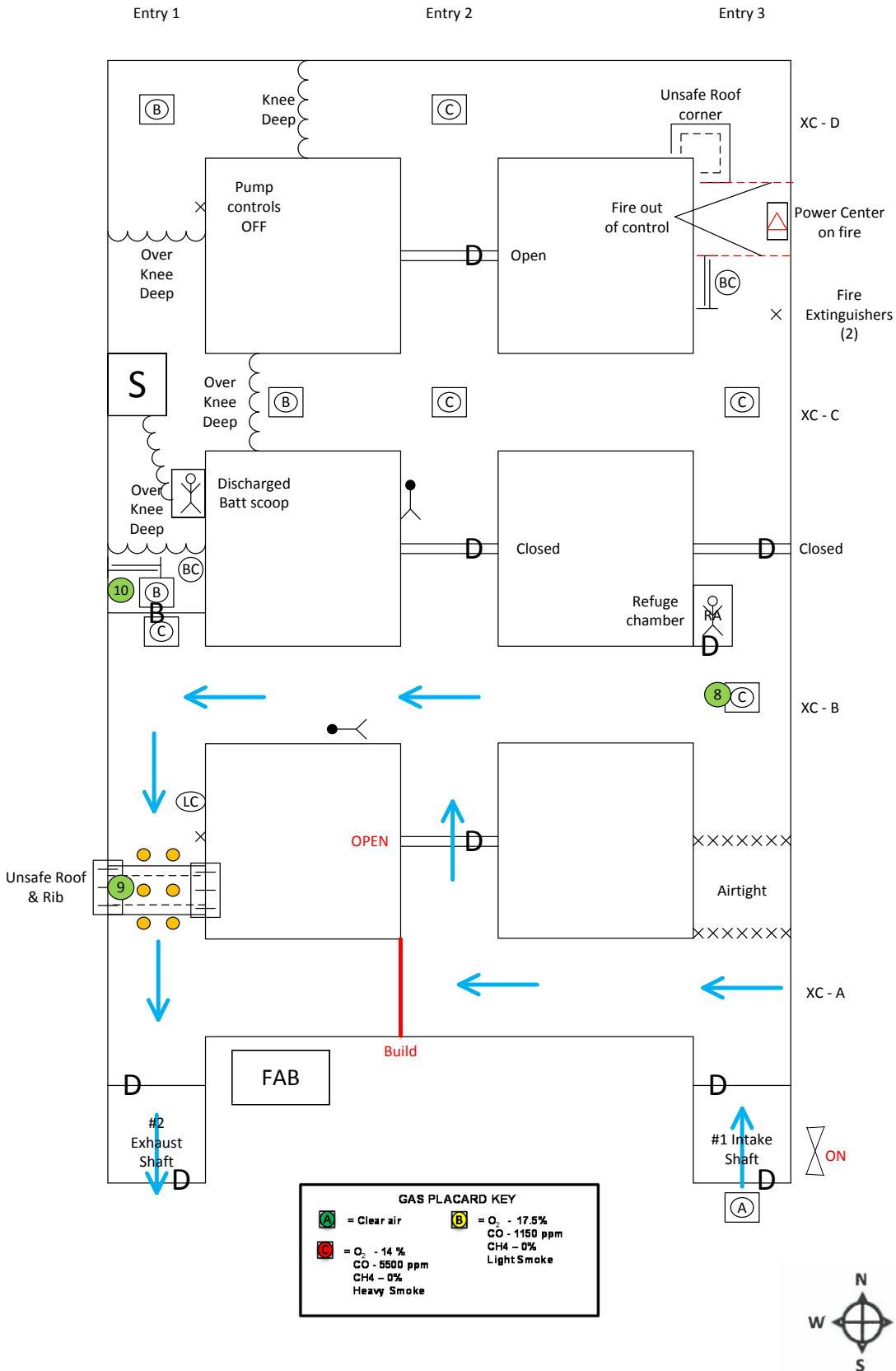
**Ventilation Change #1 to enter the Barricade (See attached map)**

The team has the means to execute the first ventilation change. The team will request the ventilation change, once granted the following steps will be required to clear the barricade.

- Build a temp stopping in XC-A anywhere between entry #1 and #2 to course the air up entry #2.
- Turn the fan ON

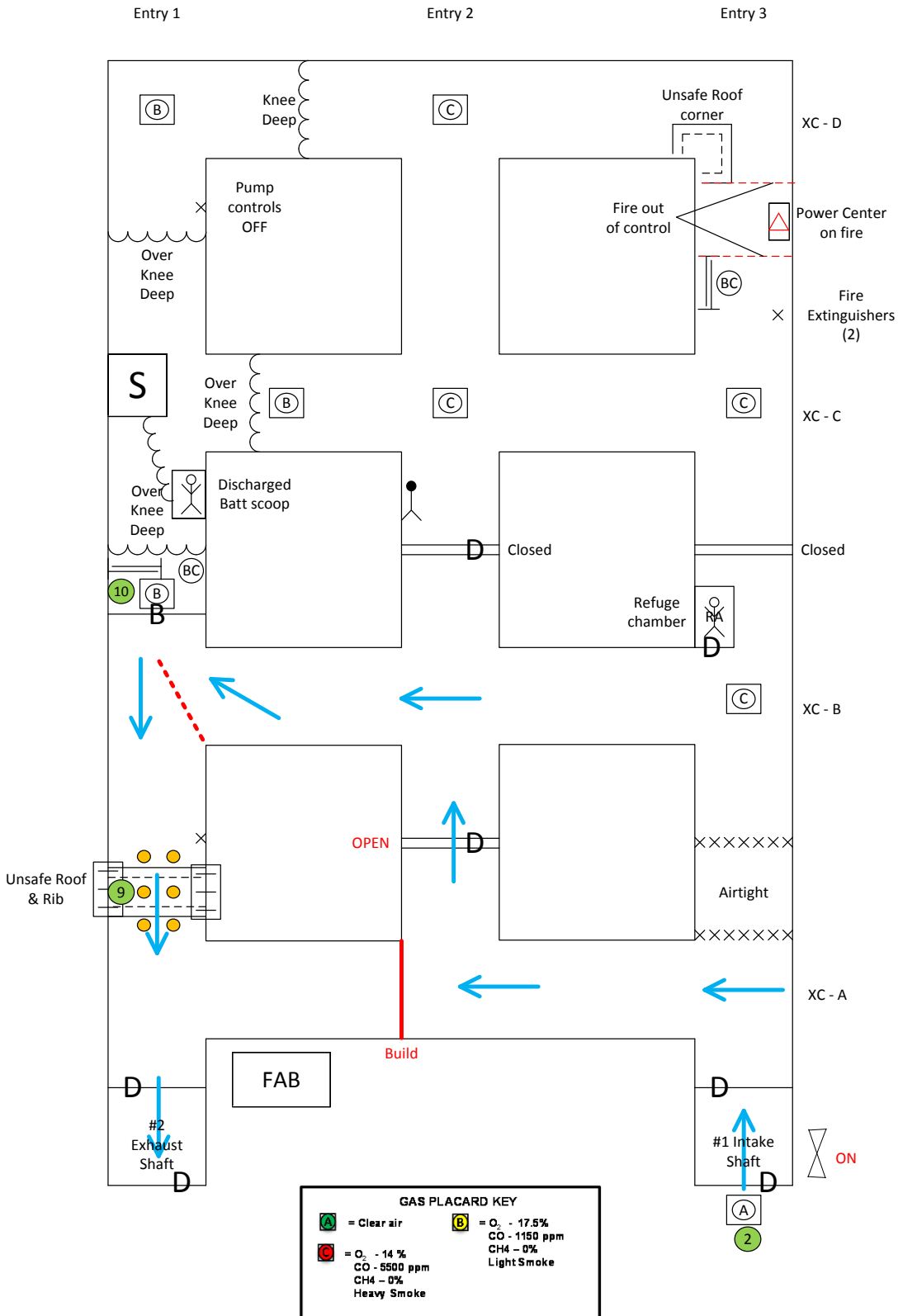
Ventilation will move along the path shown in the ventilation solution map.

Ventilation Change  
#1 to Enter the  
Barricade



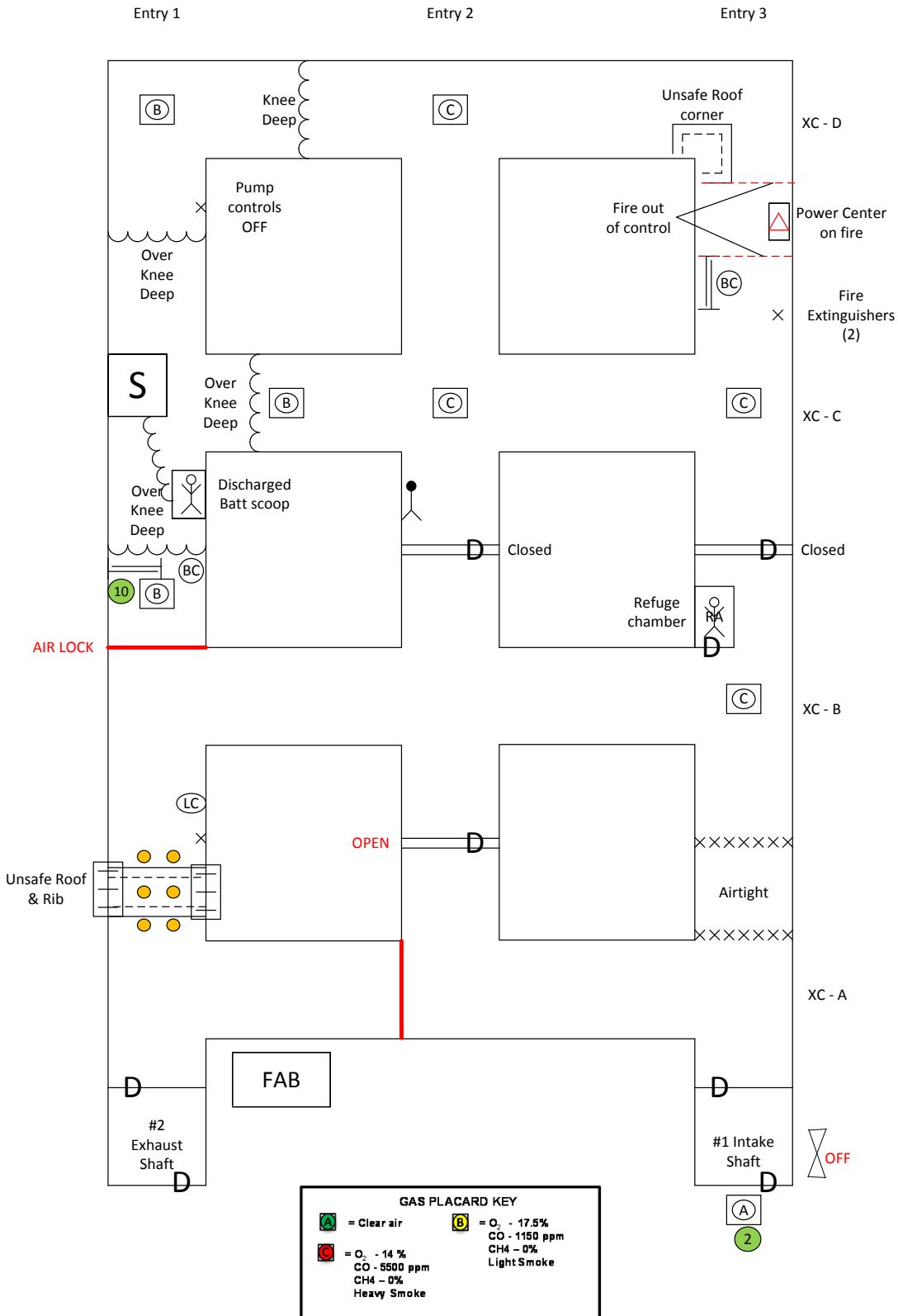
**Ventilation Change #1 also requires the team to utilize a line curtain to wing into the Barricade.**  
**(See attached map)**

Ventilation Change #1 also requires a line curtain to wing into the second Barricade



### **Team Stop #10**

Due to the unknown conditions behind the Barricade, the team will be required to construct an “Air Lock” to enter the area. The team will enter the area and identify a “Light Smoke” placard, “Building Material (1 set), and “Water Over Knee Deep”. The team will also see Jim, sitting on top of a “Discharged Battery Scoop” that is surrounded by water over knee deep. The team will not be able to access the miner and should not ask the miner to come to them. The team will need to re-barricade the area and continue exploration to find a safe means to access the survivor.





### **Team Stop #11**

Due to the gas conditions outside of the door in entry #3 the team will not be able to enter this area and must utilize entry #2. Due to the unknown conditions behind the door, the team will need to construct an "Air Lock" in entry #2 in order to enter the door. The team will explore north in entry #2, along the way they will find a deceased miner on the left. Team will make the appropriate marks and continue exploration. They will continue north until they reach the intersection in XC-C, they will find a "Heavy Smoke" placard. Stretching west the team will identify a "Light Smoke" placard and "Water Over Knee Deep". This will be the team's furthest point of advance at this time.

### **Team Stop #12**

The team will continue exploration east in XC-C until they reach the intersection of entry #3. They will find a "Heavy Smoke" placard, stretching south they will identify the backside of the permanent stopping (door closed).

### **Team Stop #13**

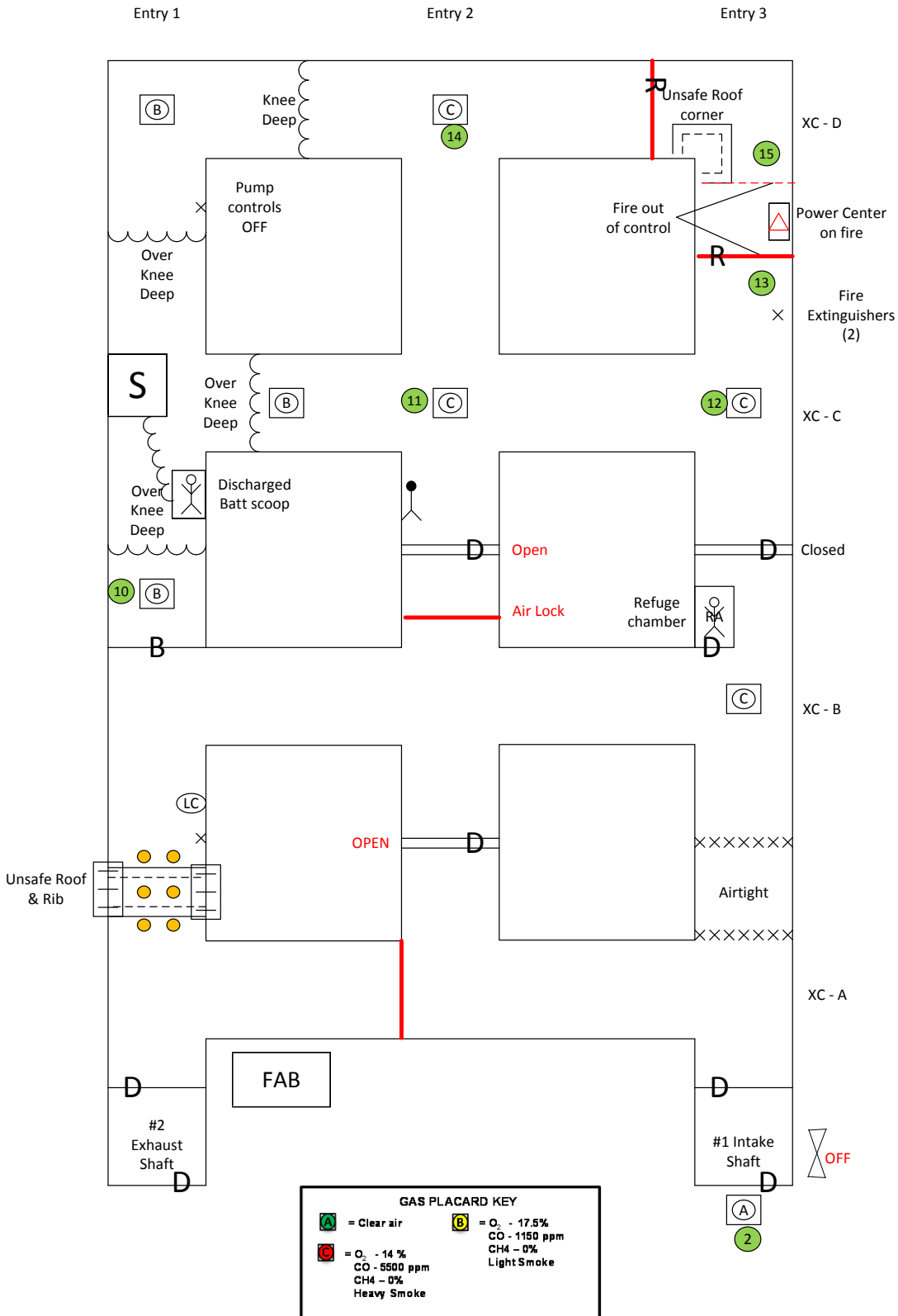
Stretching north they will identify "Fire Extinguishers (2)", "Building Material (1 set) and "Fire out of Control" the team shall, without undue delay seal or regulate the fire. The team should not attempt to extinguish the fire with the fire extinguishers. The team will construct a temporary stopping with a regulator.

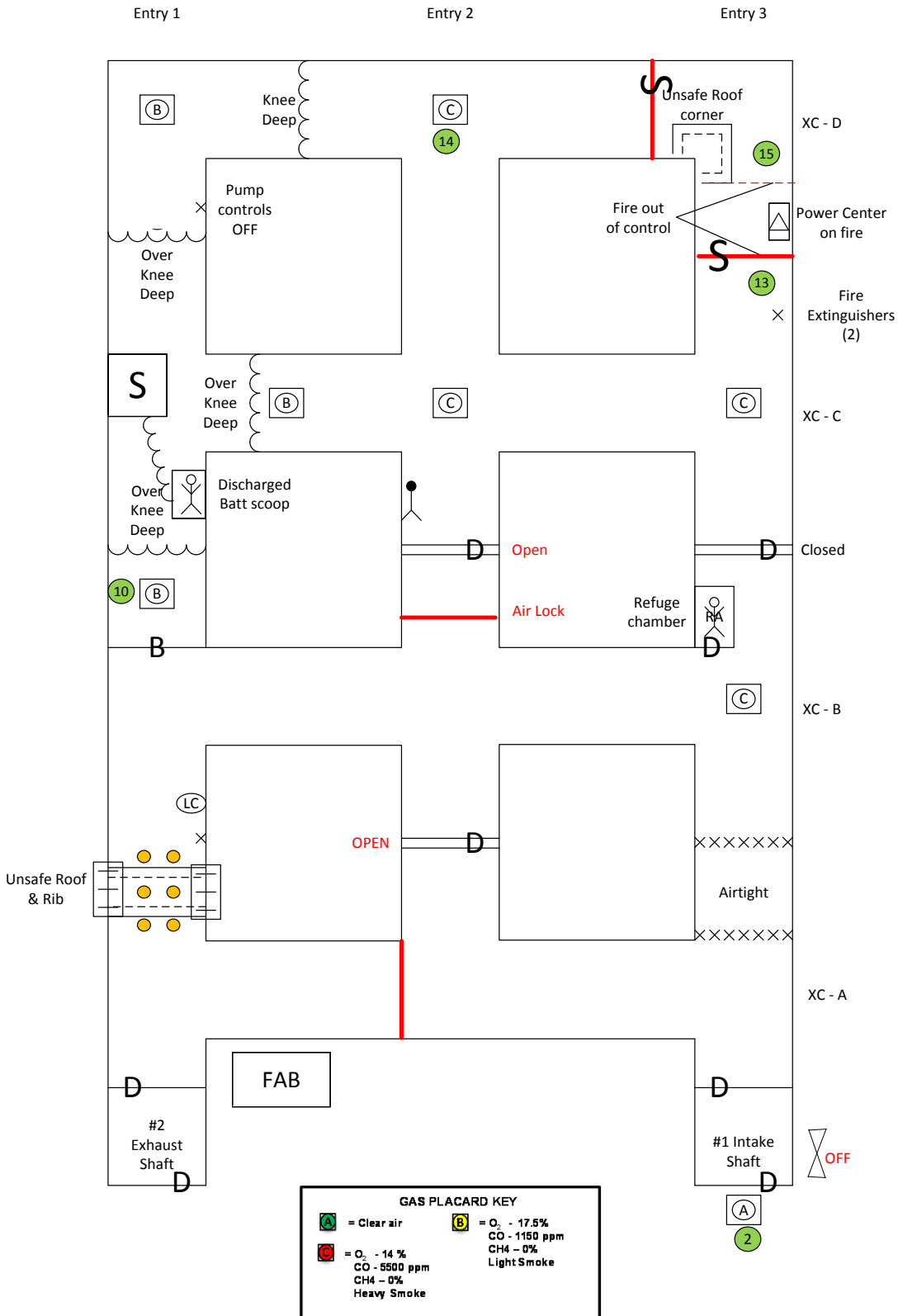
### **Team Stop #14**

The team will retreat to entry #2 to locate all other approaches to the fire. The team will explore the intersection of XC-D. The team will find a "Heavy Smoke" placard.

### **Team Stop #15**

The team will continue exploration east in XC-D, along the way they will identify an "Unsafe Roof Corner". The team will explore until they reach "Fire out of Control", the team shall, without undue delay seal or regulate the fire. Due to the location of the fire out of control placard the team will need to construct a temporary stopping with a regulator on the west side of the unsafe roof corner. The team has now identified both approaches to the fire and will seal both sides.





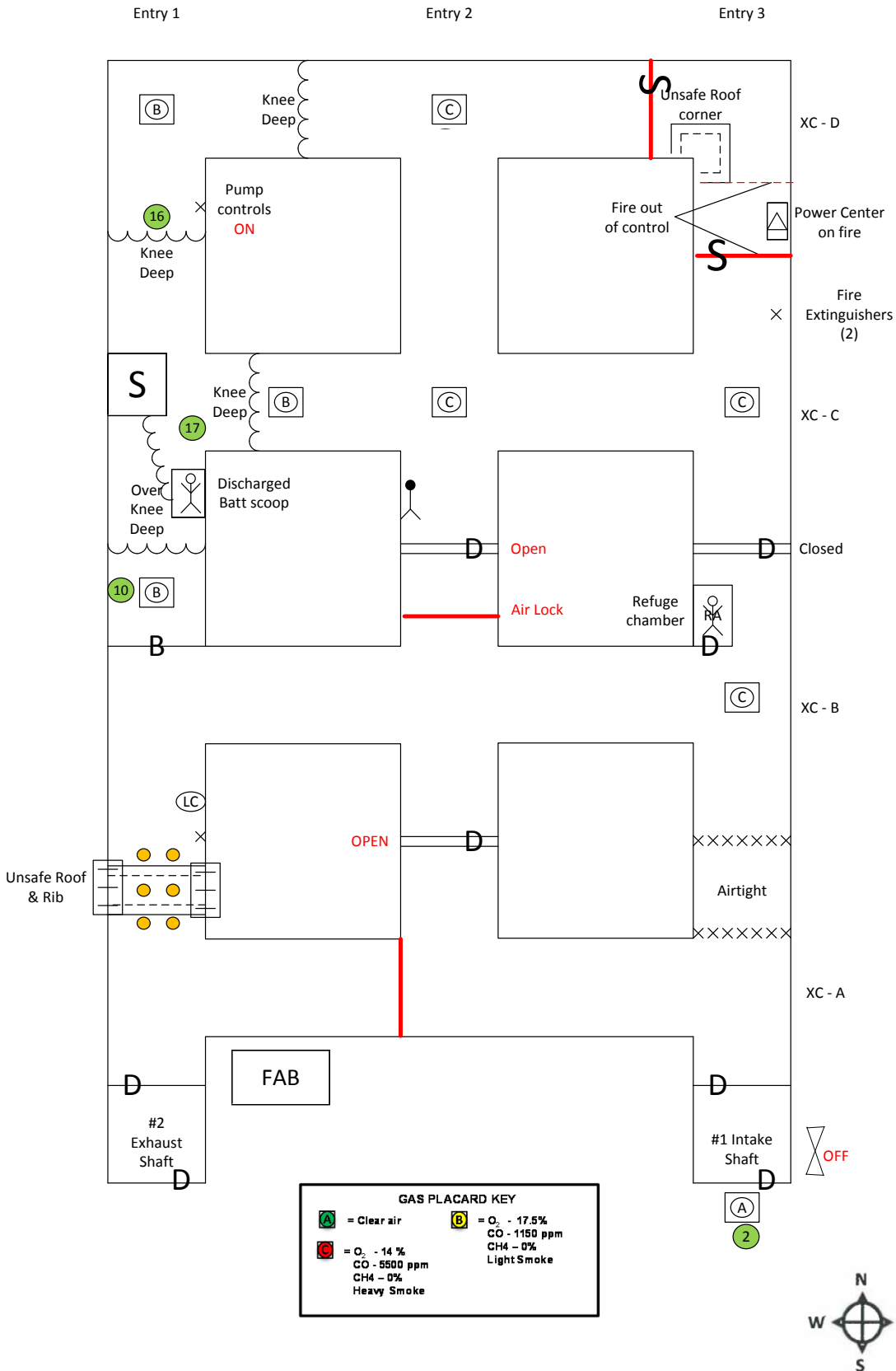
**Team Stop #16**

The team will explore west in XC-D and identify “Water Knee Deep”, the team will continue south in entry #1 until they reach “Water Over Knee Deep” the team will also identify the “Sump Pump Controls”. The team will need to turn the pump on in order to pump the water down.

**Team Stop #17**

The team can now enter the area to explore up to the survivor. The team will identify a “full sump” and tie in the area in XC-C. The team will be able to access the survivor and rescue him from the mobile equipment (Jim is not injured and can walk). Due to the gas conditions in the route the team will use to evacuate the survivor, the team will need to provide the miner with respiratory protection. The team will take Jim to the FAB.

Water Solution to access the miner.



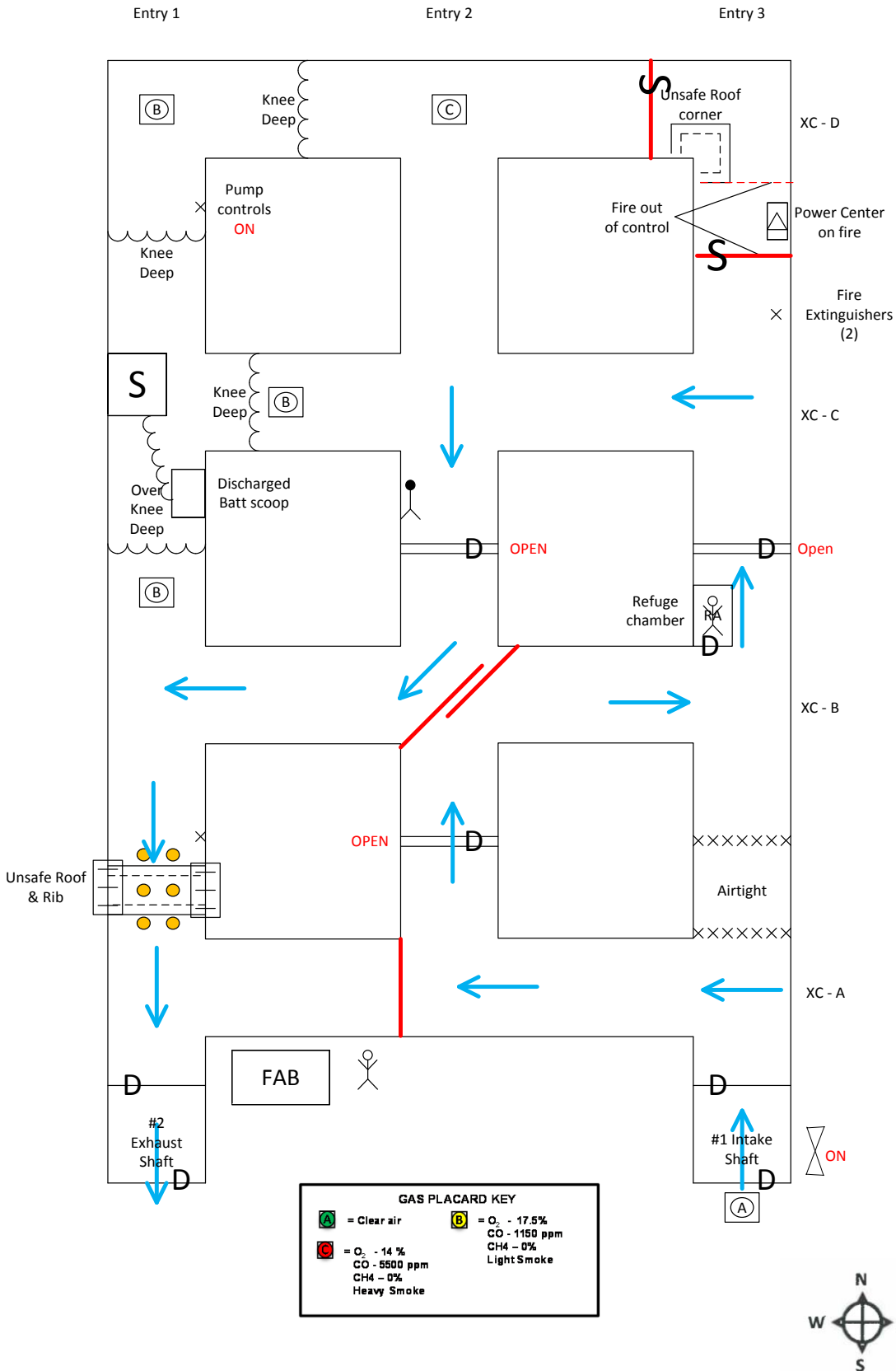
**Ventilation Change #2 to enter the Refuge Chamber (See attached map)**

The team will request the ventilation change, once granted the following step will be required to clear refuge chamber.

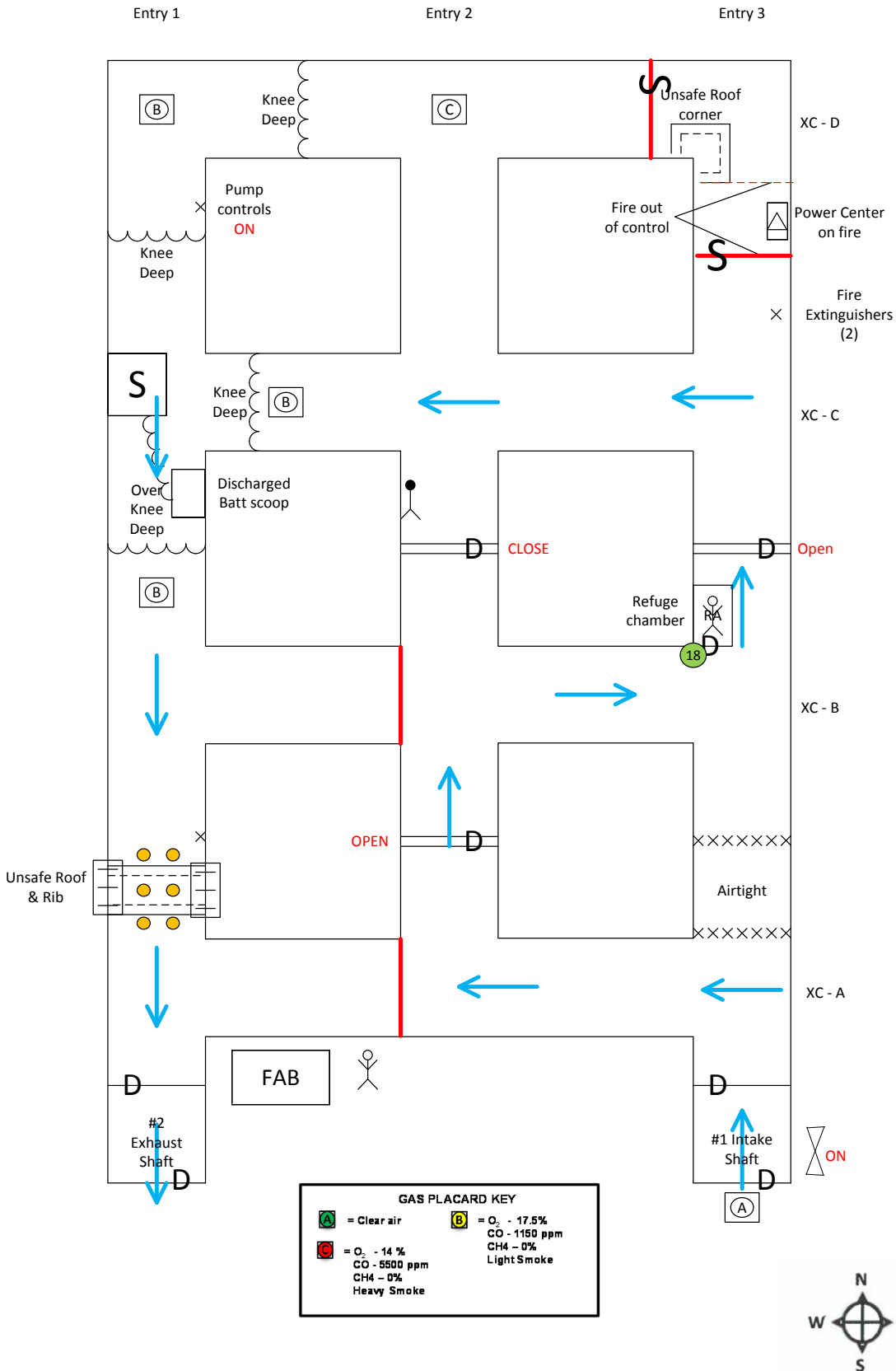
- Maintain the temporary stopping in XC-A
- Utilize 2 sets of building materials to divide the intersection of XC-B and entry #2
- Open the door in entry #2 and #3
- Turn ON the fan (Ventilation will move along the path shown in the ventilation solution map, clearing the door at the refuge chamber).

**See Alternative ventilation solution Map**

Ventilation Change  
#2 to enter the  
refuge chamber.



Alternative  
Ventilation Change  
#2 to enter the  
refuge chamber.





**Team Stop #18**

The team will enter the refuge chamber and access Drew, he is not injured and can walk out with the team.

The team will return to the FAB and provide all information to the mine manager and stop the clock. THE  
END

Team Name: \_\_\_\_\_

Team Draw # \_\_\_\_\_

# Placard Map Day 2

Entry 1

Entry 2

Entry 3

