

2017 SWRMRA Mine Rescue Contest

JUDGES PACKET

Field Competition

Day 1



April 4, 2017

Carlsbad, New Mexico

Mine Information
Carlsbad, NM
April 3-6, 2017

General

The Walnut Canyon Mine is a single level room and pillar Limestone mine owned and operated by Cavern and Associates Mining Company. Jim White is VP of Operations and Darwin Williams is currently the mine manager. The Walnut Canyon mine is located in Southeast New Mexico. The mine is active and operating at full capacity. The mine operates a single shift 10 hours per day and 5 days per week. Hours of operation are from 6 am to 4 pm. The mine does not have a history of any known hazardous conditions.

Mine Access

Mine access is provided by a single portal entrance located on the south side of the mining operation. This portal also provides access for haulage equipment to transfer material from the underground to a crushing operation on surface. The working areas of the mine are 10 feet by 10 feet and pillar sizes are 20 feet by 20 feet.

Explosives

All explosives are stored on surface in an approved storage facility.

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. The controls for the mine fan are located at the fan on surface.

Gas

Non-Gassy classification

Communication

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

Ground Control

The Mine does not utilize any ground support systems at this time but the mine does have timbers located in the mine in case it is determined to be necessary.

Materials

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

Mining Methods

Mining methods are currently drilling and blasting methods. The material is loaded onto haul trucks and transported to a surface stockpile for crushing. Surface crushing operation is located approximately 1,000 feet south of the mine portal.

Mine Maps

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

Mine Equipment

The mine currently utilizes 2 jumbo drills, 3 diesel haul trucks, 2 front end loaders and other smaller transportation equipment.

Ventilation

The mine is ventilated by a 250 hp non-reversible fan that is located on surface. The mine utilizes a blowing system; ventilation enters the mine by way of ventilation tubing at the mine portal and exits the mine through a 6 foot in diameter vent raise located in the mine.

Water

Water flows into the mine from natural springs and is collected at a sump that's located in the northeast 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.

TEAM BRIEFING

Carlsbad, NM

April 3-6, 2017

You have arrived at the Walnut Canyon Mine, the mine manager has received the following information about the events that took place today. Five miners tagged in for work this morning around 6:00 am, they were assigned to perform their normal duties and there were no known issues.

At approximately 10:00 am Don (Powder Man) left the mine to get explosives from the surface explosive magazine, after exiting the mine he heard what appeared to be an explosion but he was not alarmed due to the mining activity on surface. At about 10:45 Don observed smoke exiting the ventilation raise and quickly returned to the mine portal.

When he arrived, he met Corey (foreman) running toward the fan controls, Corey stated that there was heavy smoke inside of the mine and he was going to turn off the fan to keep from blowing more air into the mine. After shutting off the fan Corey collapsed and Don immediately called 911 for help.

It is now 3:00 pm and you will be the first team to enter the mine, we do know that we still have 3 miners unaccounted for, there is power to the mine, the mine fan is still in the off position and the mine ventilation raise is currently being guarded but is not accessible from the fresh air base. Back up teams are on site and will be available to support your team once you arrive at the fresh air base.

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!

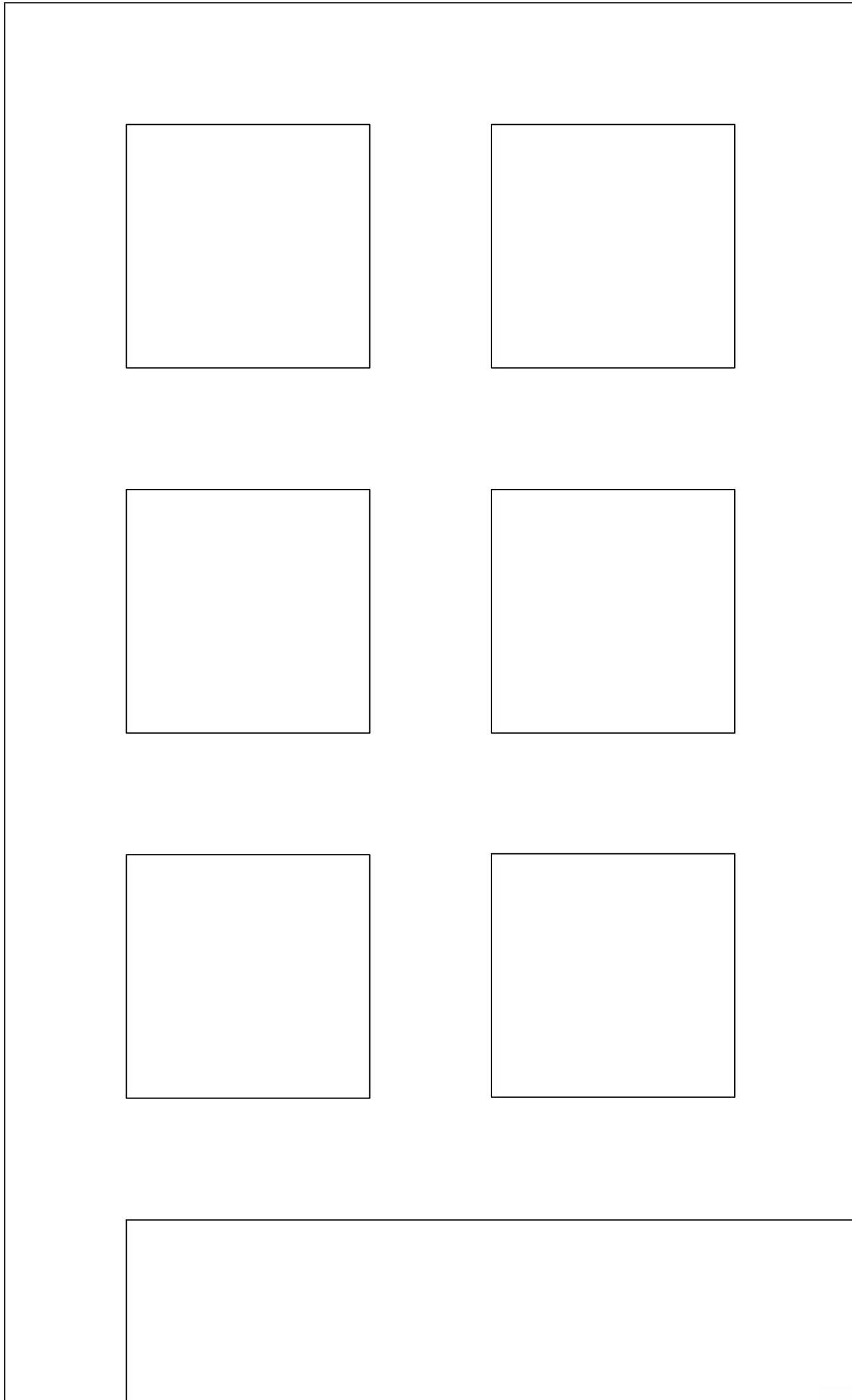
Field Problem Objectives:

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

Entry 1

Entry 2

Entry 3



XC - D

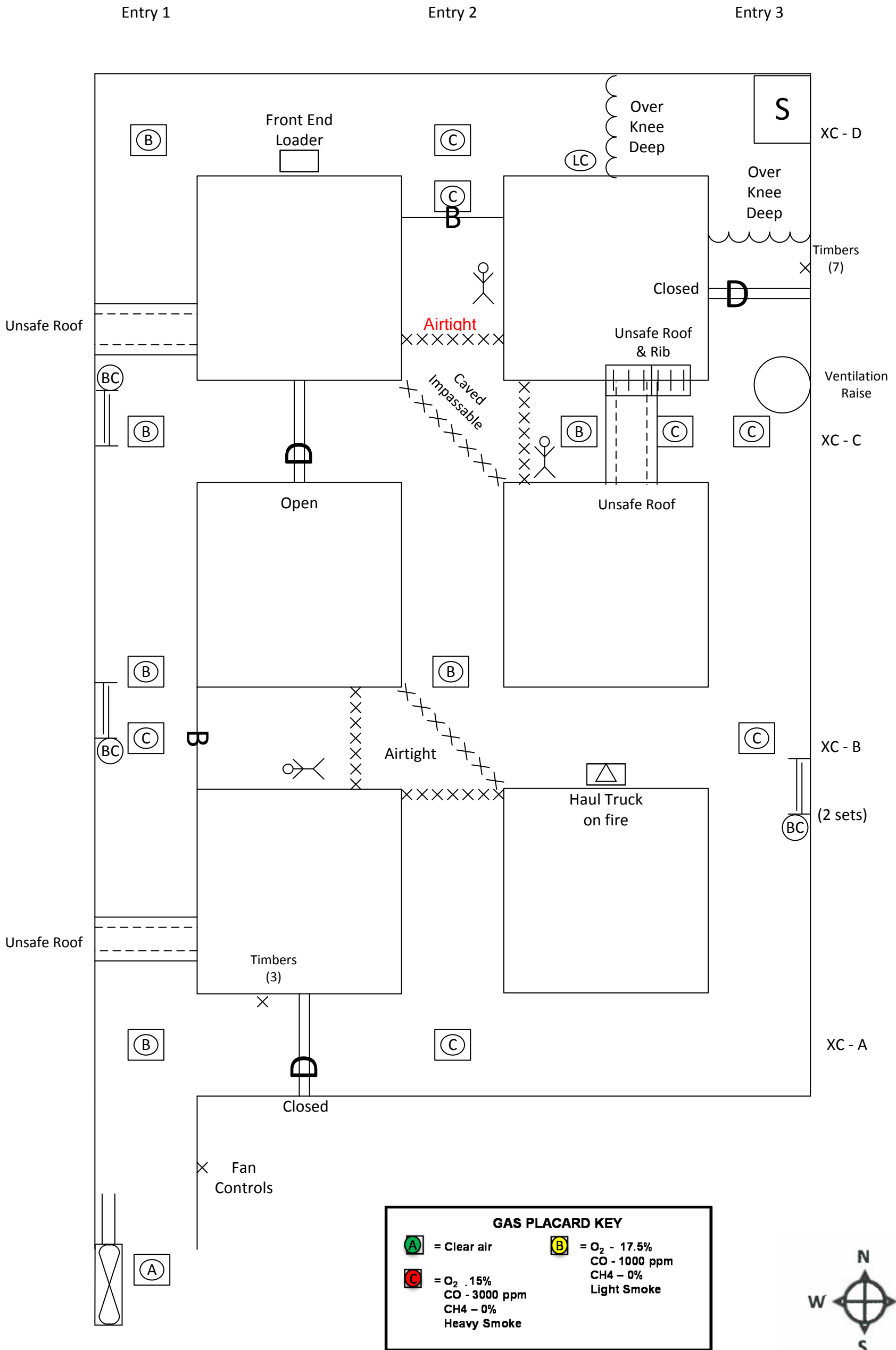
XC - C

XC - B

XC - A



Problem Map



GAS PLACARD KEY	
A	= Clear air
C	= O ₂ .15% CO - 3000 ppm CH ₄ - 0% Heavy Smoke
B	= O ₂ - 17.5% CO - 1000 ppm CH ₄ - 0% Light Smoke

Field Problem Solution Day #1

(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 and check the portal opening to the mine. They will identify a "Clear Air" placard and a ventilation Fan with tubing. They should remember that they cannot access the ventilation raise from the FAB.

Team Stop #2

Teams will enter the mine and explore north in entry #2, checking the intersection of XC-A the team will identify a "Light Smoke" placard and count off. The team will likely conduct their 50' check at this point as well. Stretching north the team will identify "Unsafe Roof", stretching to the east in XC-A the team will identify a "Permanent Stopping (door closed)" and "Timbers (3)". The team will not have building material to air lock through the door and will utilize the timber to support the unsafe roof.

Team Stop #3

The team will continue exploring north in entry #1 until they reach the intersection of XC-B, the team will only be able to explore 3 feet past the second intersection. The team will identify that they are now in "Heavy Smoke" and find a set of "Building Materials". The team will also identify a "Barricade", knocking on this barricade they will make contact with a survivor named Lee. Lee will provide the following statement. "Hey get me out of here, I'm not injured and the air in here is ok. The area behind me is airtight". The team will need to ventilate in front of the barricade before they can enter.

Team Stop #4

The team will retreat to XC-A and utilize the building material to create an air lock to enter the door. The team will explore east until they reach the intersection of entry #2 where they identify a "Heavy Smoke" placard.

Team Stop #5

The team will explore north in entry #2 until they reach "Caved Airtight", this will be their furthest point of advance at this point.

Team Stop #6

The team will retreat to XC-A and explore east until they reach entry #3. The team will then explore north in entry #3 until they reach the intersection of XC-B. They will identify "Building Materials (2 sets)" and a "Heavy Smoke" placard.

Team Stop #7

The team will explore west in XC-B and identify a "Haul Truck on Fire", this fire will be combatable and the team will be required to utilize 2 fire extinguishers to put the fire out.

Team Stop #8

The team will continue exploration west in XC-B until they reach the intersection where they find that the intersection is "Caved Airtight" diagonally from pillar to pillar. The team will also identify a "Light Smoke" placard.

Team Stop #9

The team will continue exploration north in entry #2 until they reach the intersection of XC-C, where they identify that the intersection is "Caved Impassable" diagonally from pillar to pillar.

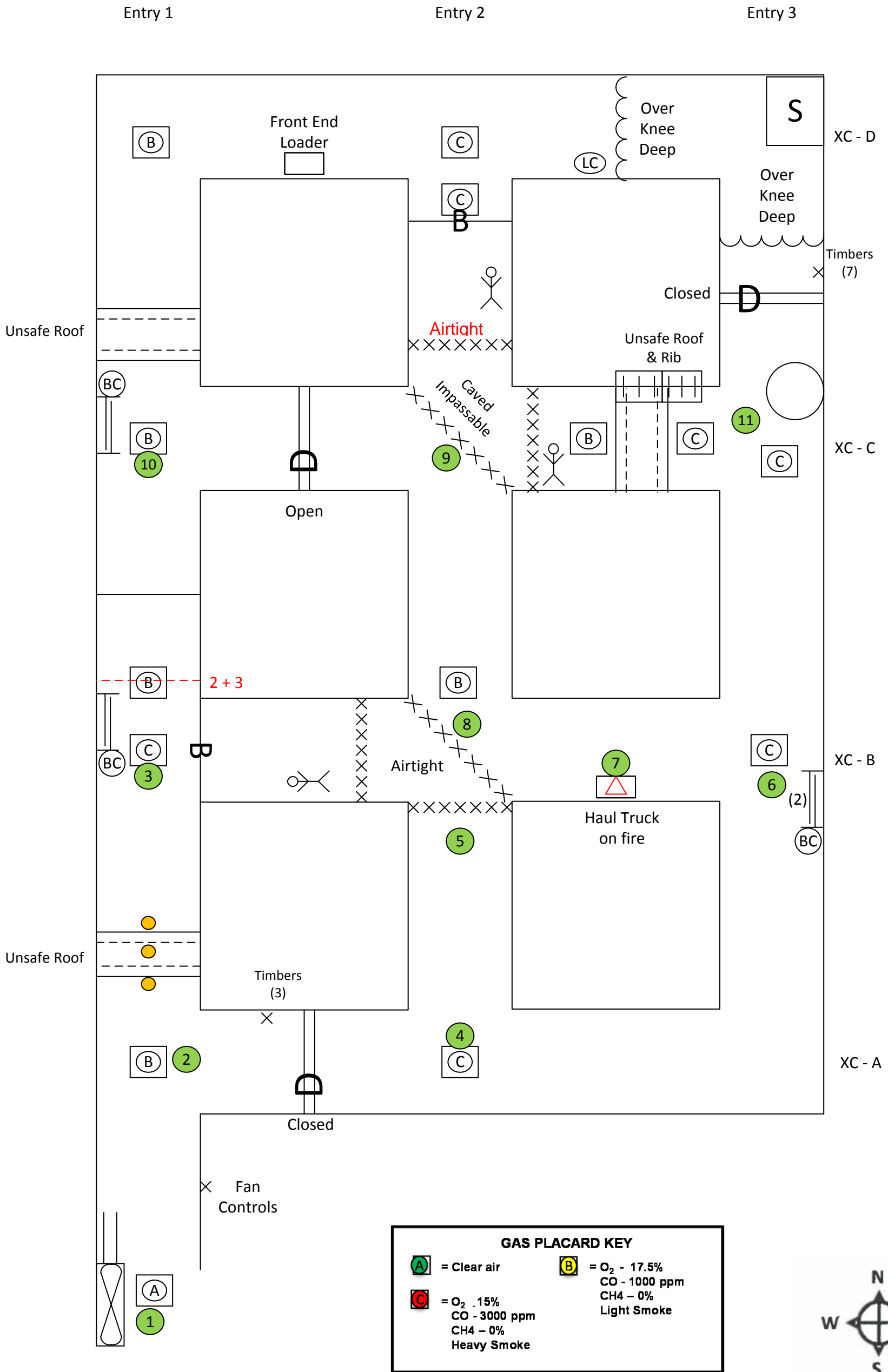
Team Stop #10

The team will continue exploration west in XC-C, until they reach the intersection of entry #1. Along the way they identify a "Permanent Stopping (door open)", "Light Smoke" placard and "Building Materials (1 set)". Stretching north they identify "Unsafe Roof", they do not have the means to support the area and will travel south to tie in to the supported area.

Team Stop #11

The team will retreat to the intersection of XC-B and entry #3. The team will continue exploration north in entry #3 until they reach the intersection. They will identify a "Heavy Smoke" placard, "Ventilation Raise". Stretching west in XC-C they identify "Unsafe Roof" on the south end of the crosscut and "Unsafe Roof & Rib" on the north side of the crosscut. The team does not have the means to support the area and will continue exploration north in entry #3. Continuing exploration in entry #3, the team will identify a "Permanent Stopping (door closed)".

Solution Map



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

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

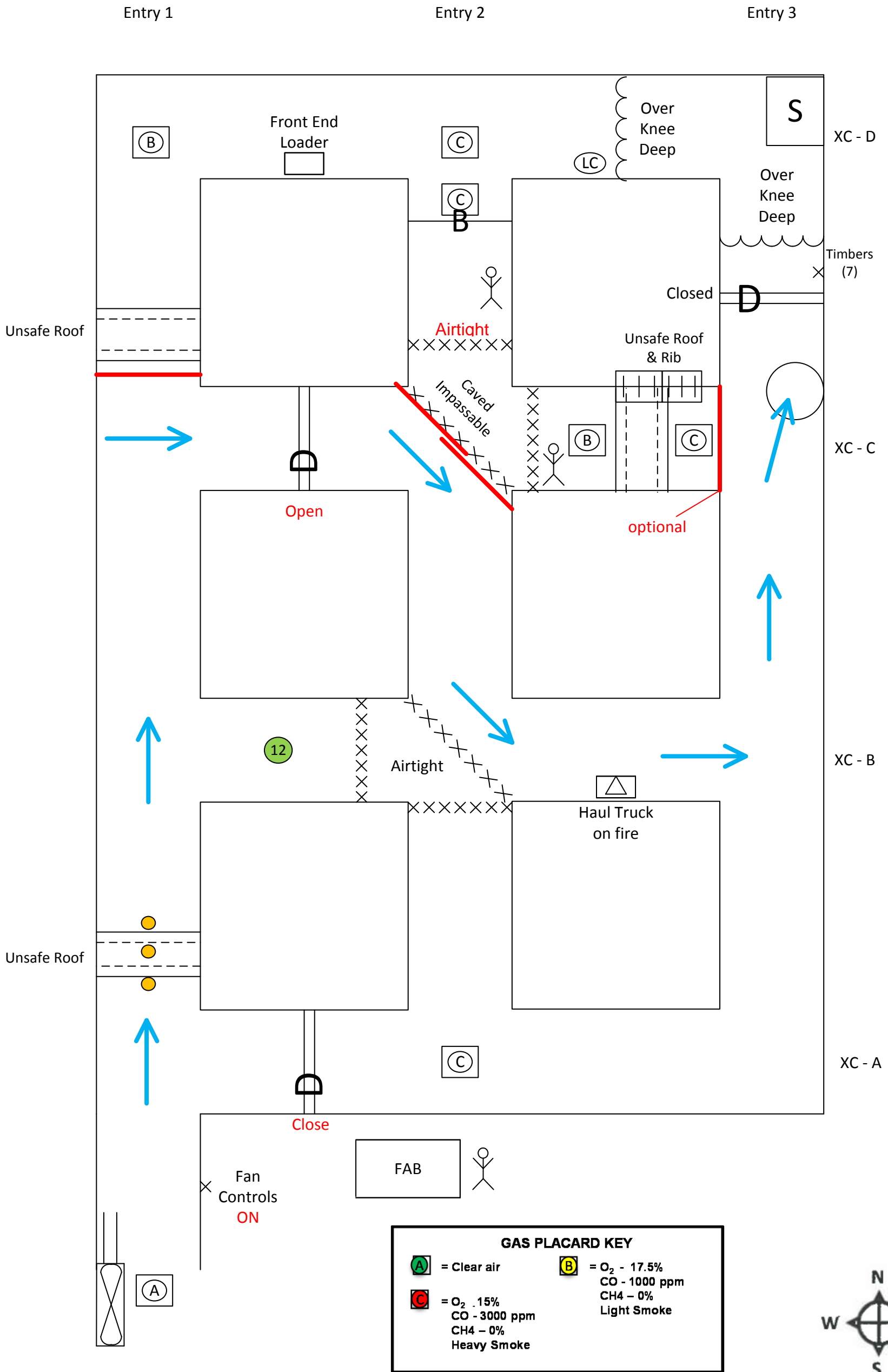
- Build a temp stopping in front of the unsafe roof in entry #1.
- Build temp stopping in front of the caved impassable in the intersection of entry #2 and XC-C. Due to the width, the team will need 2 sets of building materials.
- Turn the fan ON

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

Team Stop #12

The team will check gases along the route of entry and return to the barricade. Since conditions behind the barricade are known, the team will enter and transport the survivor to the FAB.

Ventilation Change #1 to Enter the Barricade

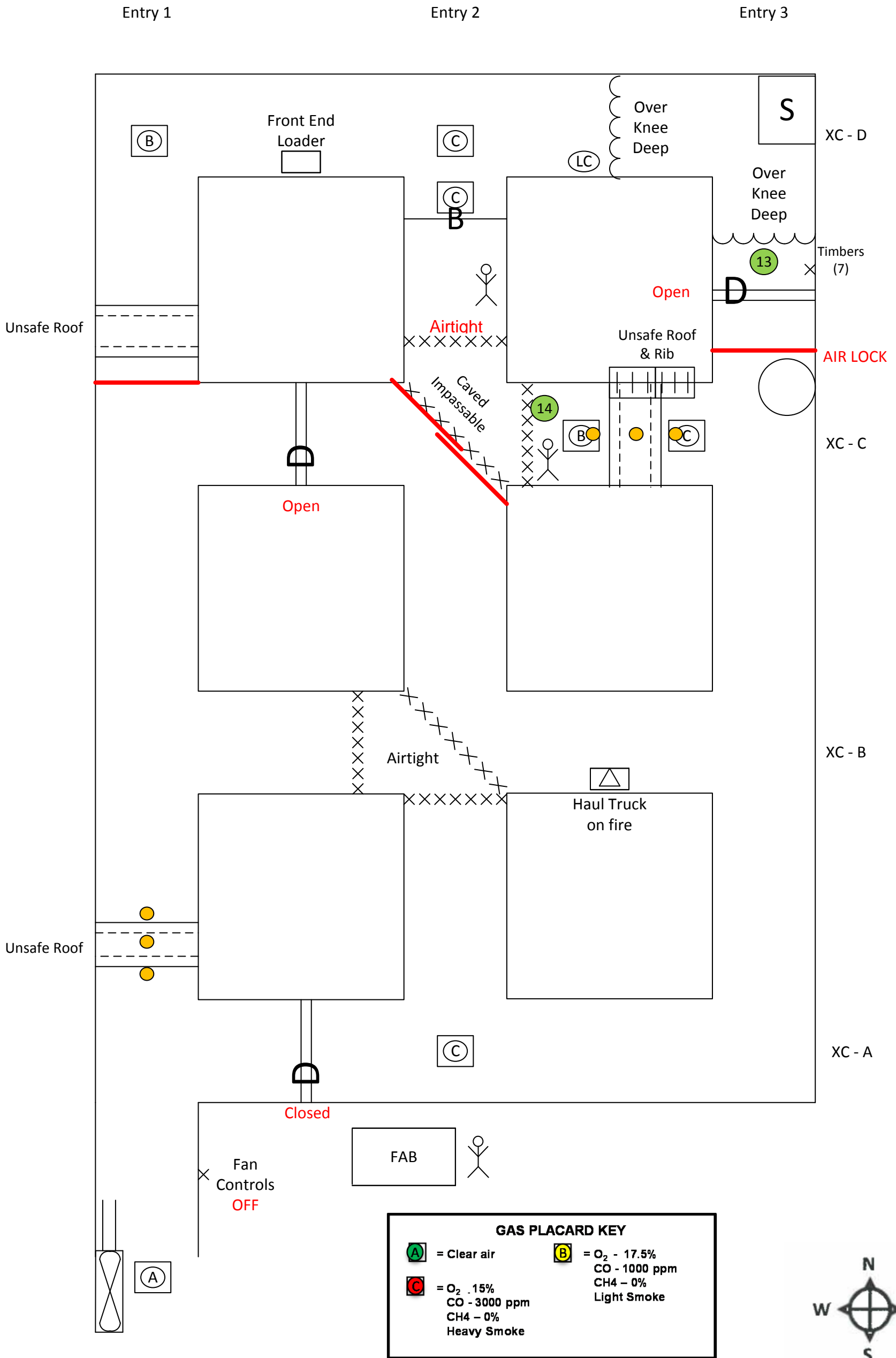


Team Stop #13

The team will return to the intersection of XC-C and entry #3. The team will construct an “Air Lock” to enter the door since condition behind are unknown. The team will enter the area and explore north until they reach “Water Over Knee Deep”. This will be the team’s furthest point of advance at this point. The team will also identify “Timbers (7)” in this area.

Team Stop #14

The team will utilize the timbers to support the unsafe roof area. Since the team has a safe rib on the south side of the crosscut, they will only be required to use 3 timbers but the team must travel between the safe rib and the timbers to enter safely. The team will identify a “Light Smoke” placard, “Caved Impassable” and the second survivor Jon. Jon will provide the following statement “I’m not injured and I can walk”. The must remember the irrespirable atmosphere just east of the unsafe roof. The team will need to provide respiratory protection to safely evacuate the miner.



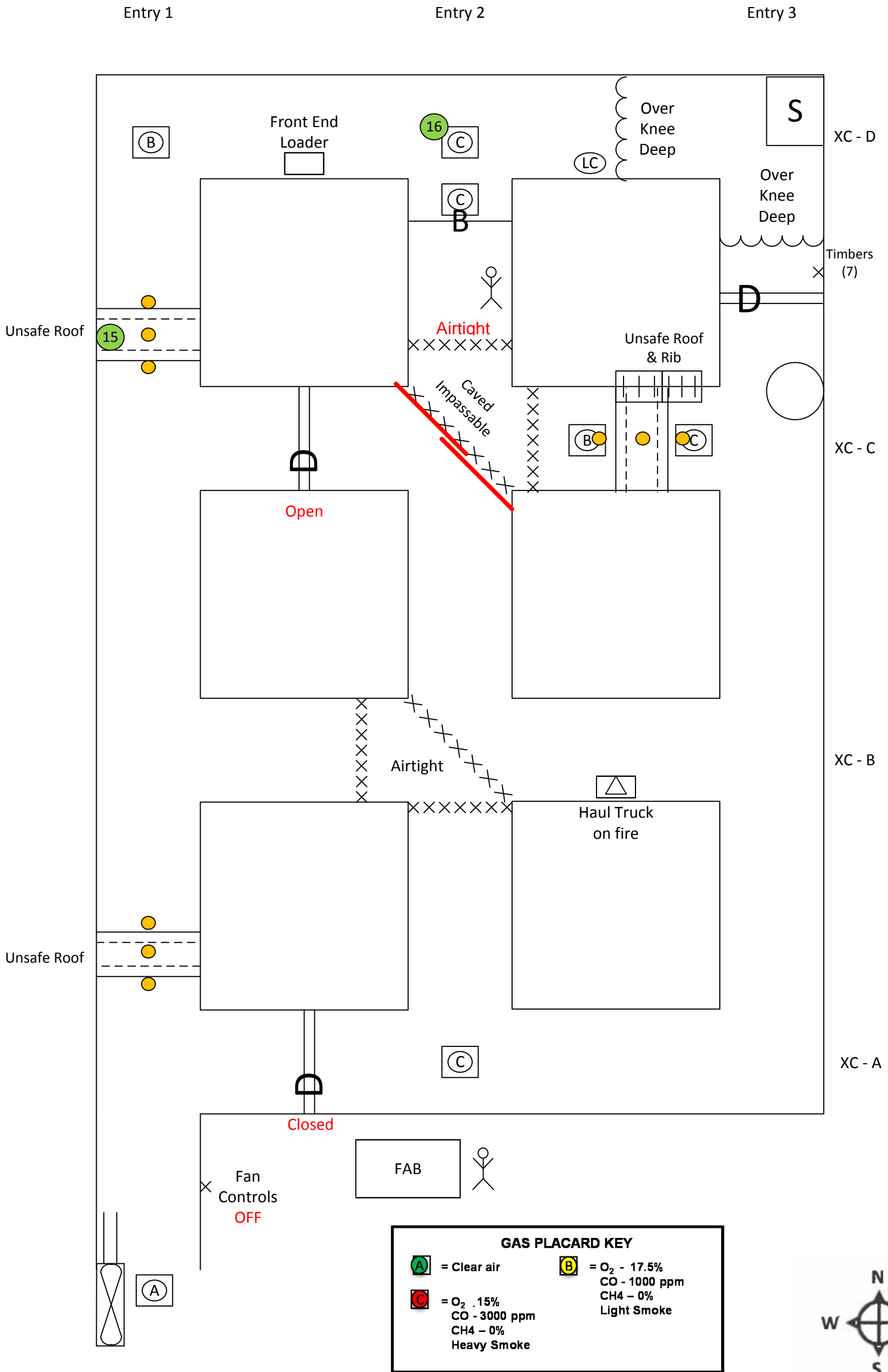
GAS PLACARD KEY	
A	= Clear air
C	= O ₂ - .15% CO - 3000 ppm CH ₄ - 0% Heavy Smoke
B	= O ₂ - 17.5% CO - 1000 ppm CH ₄ - 0% Light Smoke

Team Stop #15

The team will travel north in entry #1 until they reach the “Unsafe Roof”, utilizing 3 of the remaining timbers they can safely support the area.

Team Stop #16

The team will continue exploration to the intersection of XC-D and entry #2. Along the way the team will identify a “Light Smoke” placard and a “Front end Loader”. Exploring the intersection they identify a “Heavy Smoke” placard and a barricade. Knocking on barricade the team will make contact with the third and final survivor named Al. Al will provide the following statement “Hey get me out of here, I’m not injured and the air in here is ok. The area behind me is airtight”. The team will need to ventilate in front of the barricade in order to enter to rescue the survivor. Stretching east they identify a “Line Curtain” and “Water Over Knee Deep”, this will be the teams furthest point of advance.



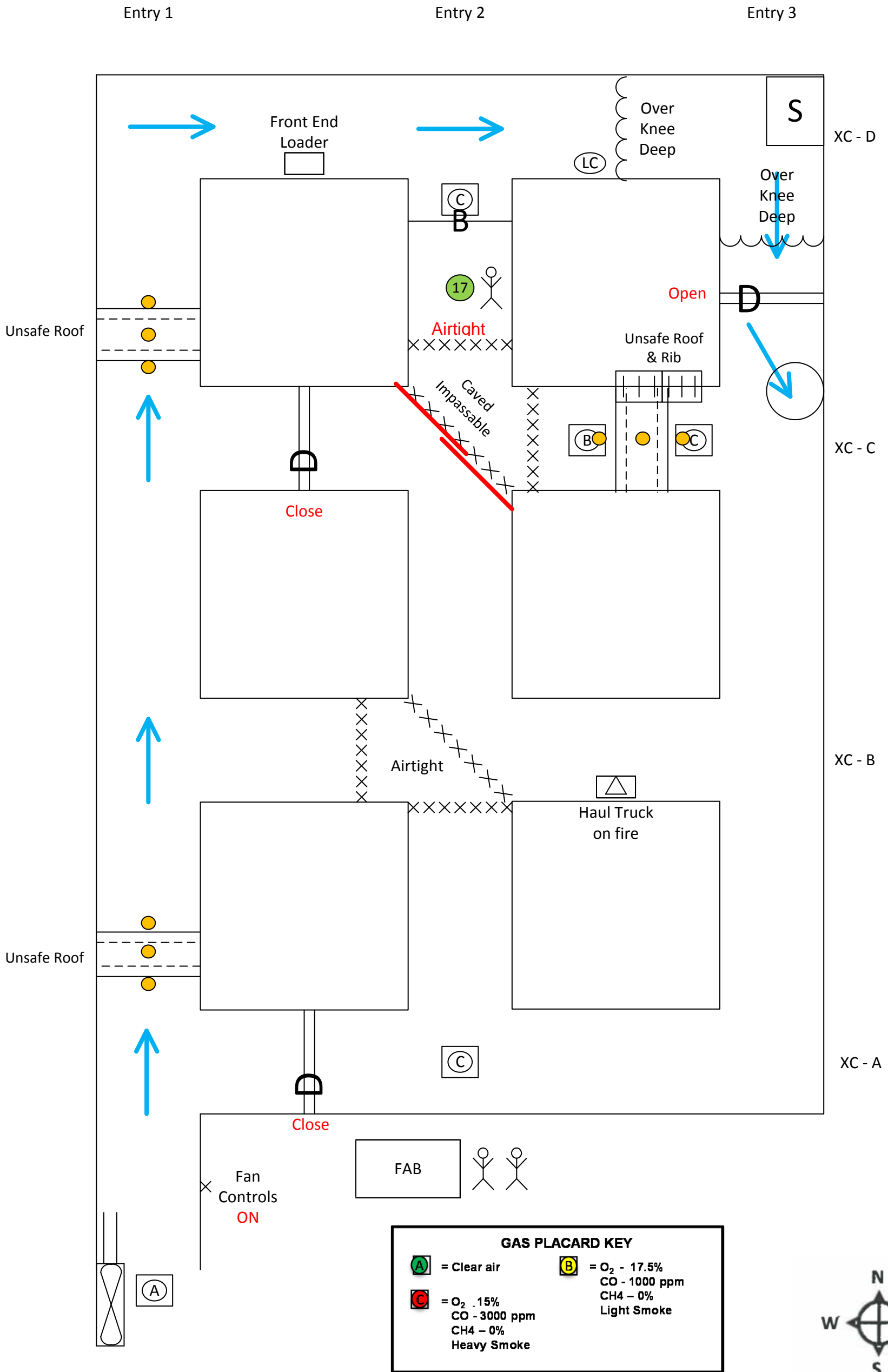
GAS PLACARD KEY	
A	= Clear air
B	= O ₂ - 17.5% CO - 1000 ppm CH ₄ - 0% Light Smoke
C	= O ₂ - 15% CO - 3000 ppm CH ₄ - 0% Heavy Smoke

Ventilation Change #2 to enter the second Barricade (See attached map)

The team will request the ventilation change, once granted the following step will be required to clear the barricade. **Note: Since the team has located all missing miners, they will not need to pump the water over knee deep and will be permitted to move ventilation over this area.**

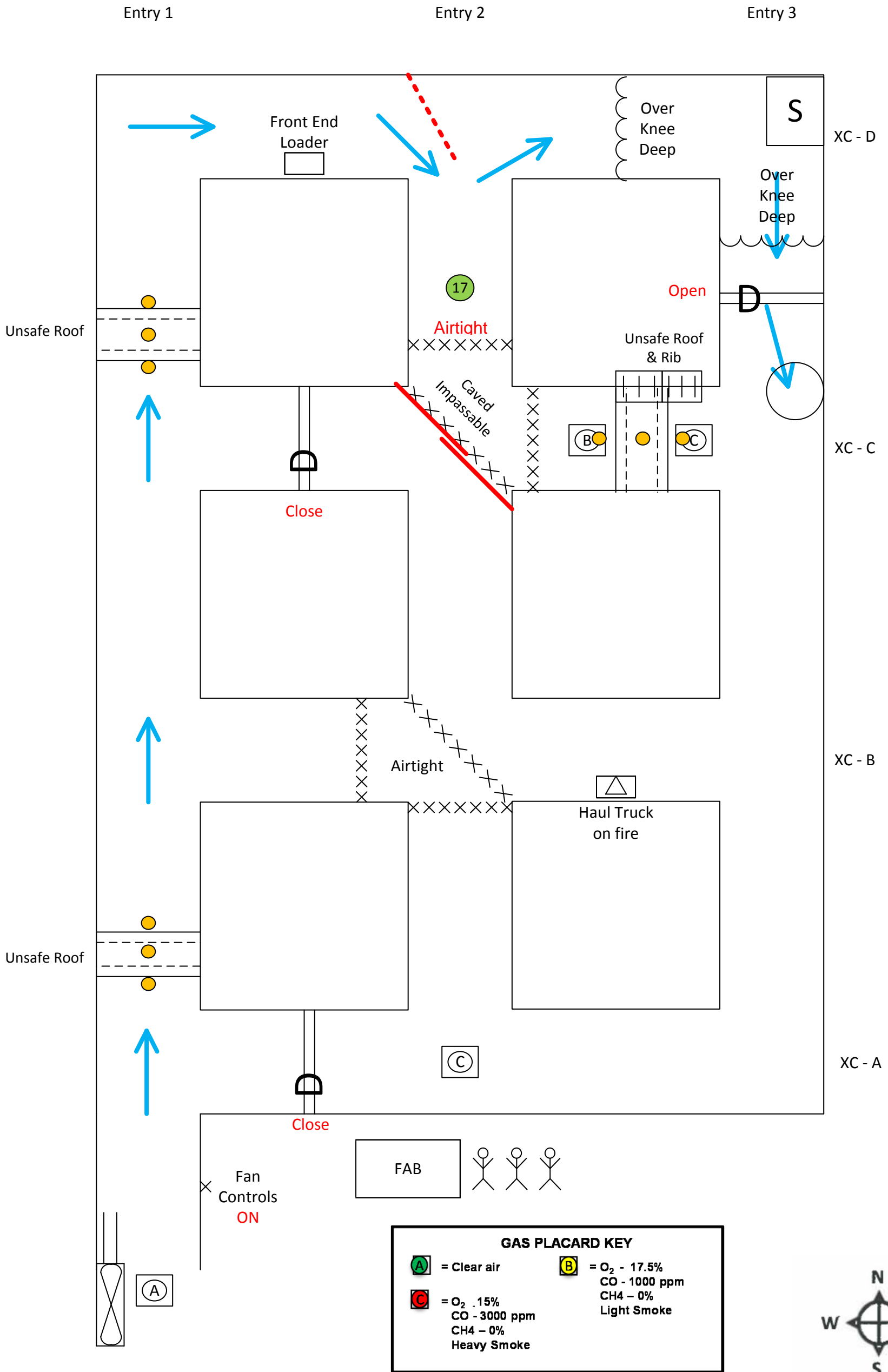
- Maintain the door open in entry #3
- Close the door in XC-A
- Close the door in XC-C
- Turn on the fan (Ventilation will move along the path shown in the ventilation solution map). The placard directly in front of the barricade will remain and the team will need to utilize the line curtain to course the air to the barricade.

Ventilation Change #2 to Enter the Second Barricade



GAS PLACARD KEY	
A = Clear air	B = O ₂ - 17.5% CO - 1000 ppm CH ₄ - 0% Light Smoke
C = O ₂ - 15% CO - 3000 ppm CH ₄ - 0% Heavy Smoke	

Ventilation Change #2 also requires a line curtain to wing into the second Barricade



GAS PLACARD KEY	
A = Clear air	B = O ₂ - 17.5% CO - 1000 ppm CH ₄ - 0% Light Smoke
C = O ₂ .15% CO - 3000 ppm CH ₄ - 0% Heavy Smoke	

Team Stop #17

The team will enter the barricade and make contact with the final missing survivor. The survivor will not be 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

Placard Map

