

37Th Annual Southwestern Regional Mine Rescue Contest

JUDGE PACKET

Field Competition Day 1



April 9, 2019

Mescalero/Ruidoso, New Mexico

Mine Information
Ruidoso, NM
April 8 - 11, 2019

General

The Notso Lucky Mine is an underground single level category IV room and pillar Potash mine. The mine is owned and operated by Step Brothers Enterprises. John Notso and Jim Lucky started the mining operation in 2000. The mine was abandoned in 1990 after several seismic events collapsed one of the shafts. Previous ownership eventually filed for bankruptcy and closed the mine. The mine is located in Southern New Mexico and is active and operating at full capacity. The mine operates two 12 hours shifts per day, 5 days a week. Hours of operation are from 5 am to 5 pm on day shift and 5 pm to 5 am on night shift. All production is on the 1000' level. Ack Mikeman is VP of Operations and Richard "Woody" East is currently the Mine Manager.

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. Pillar sizes are 16 feet by 15 feet, Entries are 10 feet wide and crosscuts are 8 feet wide.

Explosives

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

Electricity

Electrical service to the mine is provided by an independent electric company and enters the mine by way of the #1 shaft. Power is provided to transformers located underground and distributed to the working areas.

Gas

The mine is a category IV (applies to mines in which noncombustible ore is extracted and which liberate a concentration of methane that is not explosive nor capable of forming explosive mixtures with air based on the history of the mine or the geographical area in which the mine is located).

Communication

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

Ground Control

Ground control is maintained with 8 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 conventional mining techniques. Material is loaded by front end loaders into haul trucks, hoisted to surface, screened and loaded to be shipped overseas.

Mine Maps

The mine maps were last updated on January 1, 2017.

Mine Equipment

The mine currently utilizes under-cutters, face drills, haul trucks, loaders, bolters, and other smaller Kubota tractors for transporting personnel.

Ventilation

The mine is ventilated by a non-reversible 100,000 cfm fan that is located on surface at the #1 shaft. The mine utilizes a blowing system; ventilation enters the mine via the #1 Intake shaft and exits the mine via the #2 exhaust shaft. There are two 6' in diameter ventilation raises known as "Vent Raise A" and "Vent raise B". Ventilation raise "B" has a non-reversible exhaust fan that was used during the development of the north portion of the mine. Fan located above the "Vent Raise B" is a 30,000 cfm fan and exhausts air to surface.

Water

No reported or historical water issues.

Notification

All federal, state and local officials have been notified.

Backup Teams

Two additional trained and fully equipped mine rescue teams are on site and are available for backup support.

TEAM BRIEFING

Ruidoso, NM Day #1

April 8 - 11, 2019

You have arrived at the Notso Lucky Mine, Mine Manager Richard "Woody" East has arrived and received the following information. Eight miners are scheduled on this shift, four of which entered the mine at 5:30 am while the other four were tasked to gather supplies from the surface warehouse. The four miners were returning from the warehouse when they observed smoke exiting ventilation raise B, they immediately traveled to the surface mine office intending to contact the miners that were underground.

When they arrived at the surface office, Gary Ridge (Supervisor) was already there and stated that he along with the other three miners entered the mine. The miners were examining their mobile equipment when he realized that he forgot his workplace examination sheets and the keys to his vehicle. He informed the crew to get started and he would be right back.

Gary returned to surface and while at the mine office he heard the fan shut down and felt the ground shake. He made several attempts to contact the miners underground and with no success, he notified MSHA of the incident and requested assistance.

Gary also contacted Woody and informed him that three of his crew members were currently unaccounted for and it was too dangerous to enter the mine but he was going to make an attempt to see if he could find them.

It is now 5:00 p.m. and you will be the first team to enter the mine. The four miners that were originally on surface, along with the supervisor are accounted for but have been sent home. The gas concentrations at the ventilation raises are being monitored and guards have been posted. There is a steady amount of light smoke exiting Vent Raise B. The main fan at the #1 shaft is still under repair at this time. The fan located at Vent Raise B is being evaluated by the electricians. There is power to the mine and it should be available for use 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 for any questions or requests.
GOOD LUCK!

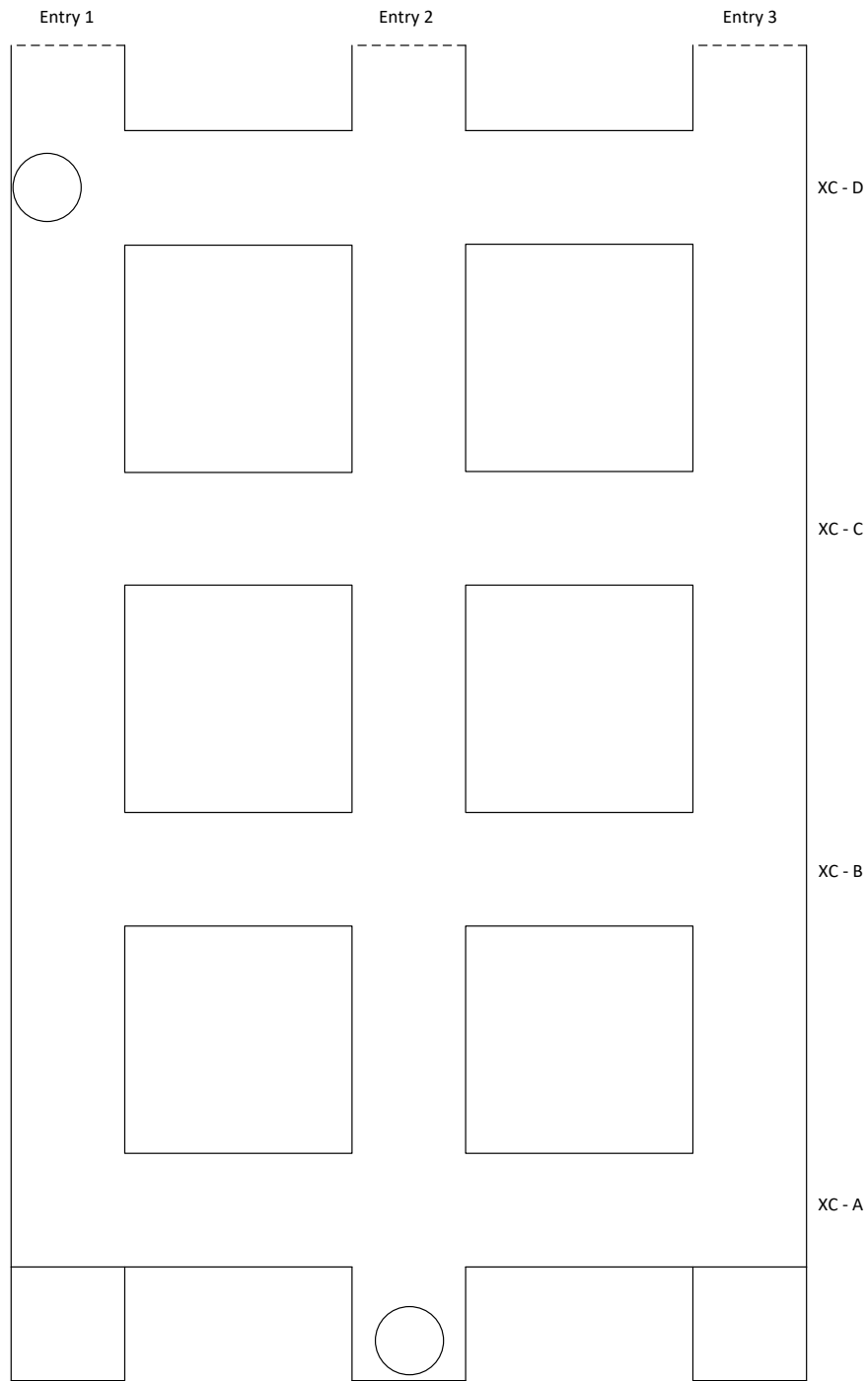
Field Problem Objectives:

- 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 1

Team Name: _____

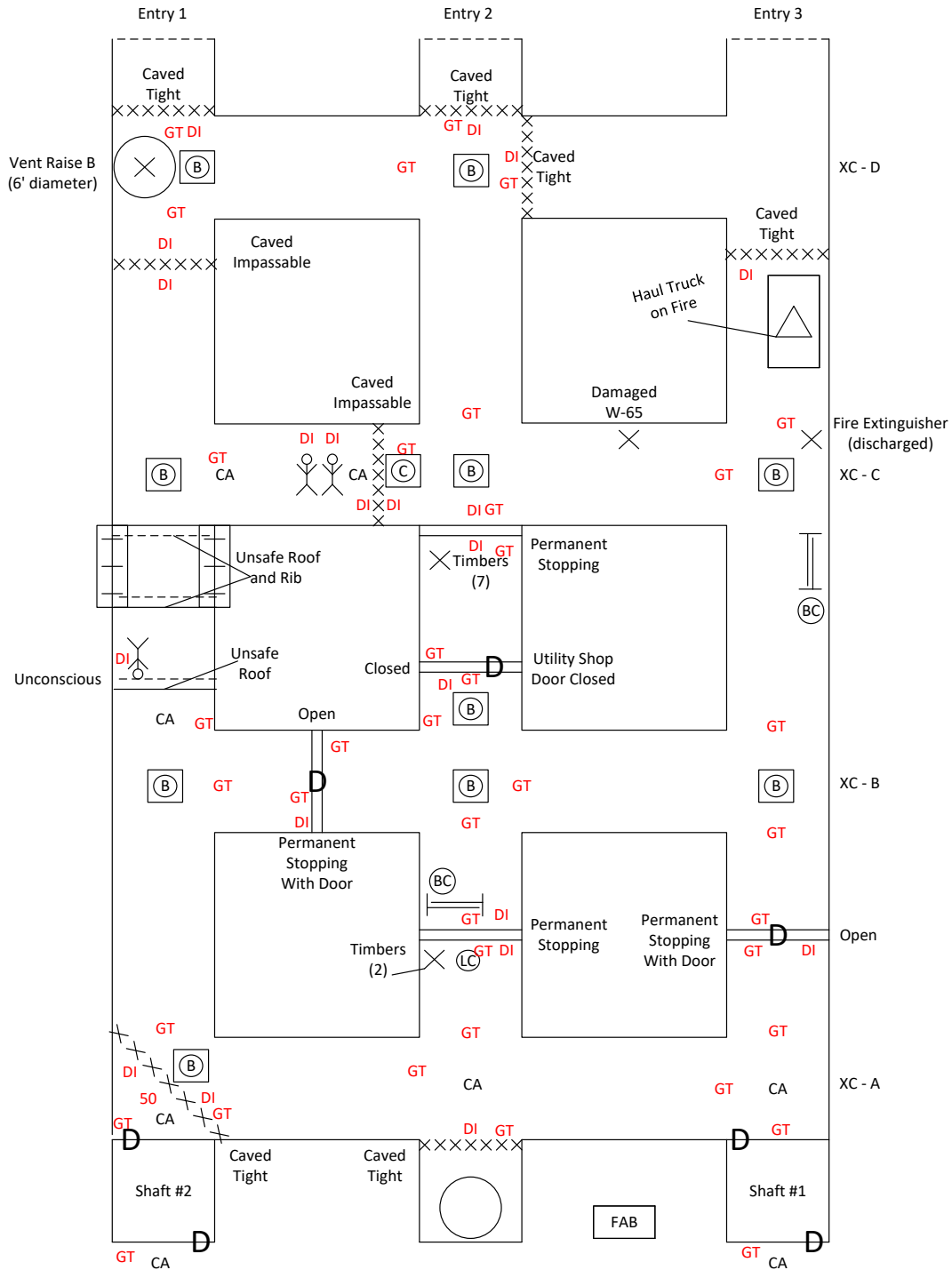
Team Draw # _____



Problem Map Day 1

Team Name: _____

Team Draw # _____



Gas Placard Key	
CA = Clear Air	⊙ = O ₂ - 17%
⊖ = O ₂ - 16%	⊙ = CO - 0.11%
⊖ = CO - 0.14%	⊙ = NO ₂ - .0028%
⊖ = NO ₂ - .0018%	⊙ = CH ₄ - 0%
⊖ = CH ₄ - 0%	



Southwestern Regional Mine Rescue Contest 2019

Day #1 Field Problem Solution

(See Solution Maps)

Fresh Air Base

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.

Mine Manager Statement

- The fan located at the #1 Shaft is still under repair, the team will be notified when it is operational.
- The fan located at Vent Raise B is now operational, it remains “OFF” but it can be started/stopped as necessary upon request to Mine Manager.

Note: Throughout the field problem, while advancing and at the intersections the team will check for loose ground (loose roof or rib).

Team Stop #1 (Shaft #1 Checks reveal)

The teams must conduct necessary gas tests. A placard at the shaft shows “clear air”. The conveyance will be at the top of the shaft. The team will place combustible materials on the cage and send it down, using the posted shaft signal codes. The team will then signal cage to return to the surface. When the material is checked, it will be intact and dry.

The teams failure to check this shaft for damage will result in a team endangerment (75 discounts) per Judge 1 – UG Rule #10(b)(1).

Note: At each shaft, Judge No.1 will allow 10 seconds for the conveyance to travel in each direction, each time the shaft conveyance is used.

Team Stop #2 (Shaft #2 Checks reveal)

The teams must conduct necessary gas tests. A placard at the shaft shows “clear air”. The conveyance will be at the top of the shaft. The team will place combustible materials on the cage and send it down, using the posted shaft signal codes. The team will then signal cage to return to the surface. When the material is checked, it will be intact and dry. The team may elect to enter the mine by way of the #2 shaft. The team will count off entering the cage (first time they go underground). When the team arrives at the shaft bottom, before exiting the cage the captain must check for loose in front of the cage. Just beyond the cage door the team will identify a placards indicating “clear air” and “caved tight”. The team will likely conduct their 50’ check. The team will then retreat to surface to enter the mine by way of the #1 shaft.

Team Stop #3

After the team has entered the mine by way of the #1 shaft and check for loose in front of the cage door, the team will advance into the mine until they reach the intersection of Entry 3 and XC-A. The team will identify a placard indicating “clear air”, stretching north the team will identify “permanent stopping with door” and it will be closed.

Team Stop #4

The team will continue exploration west in XC-A until they reach the next intersection. They will identify a placard indicating “clear air”, south of the team they will identify “caved tight, eliminating the use of ventilation raise “A”. Stretching north in Entry 2, the team will identify “timbers (2)”, “line curtain”, and a “permanent stopping”. The team will likely take the line curtain and timbers with them for use.

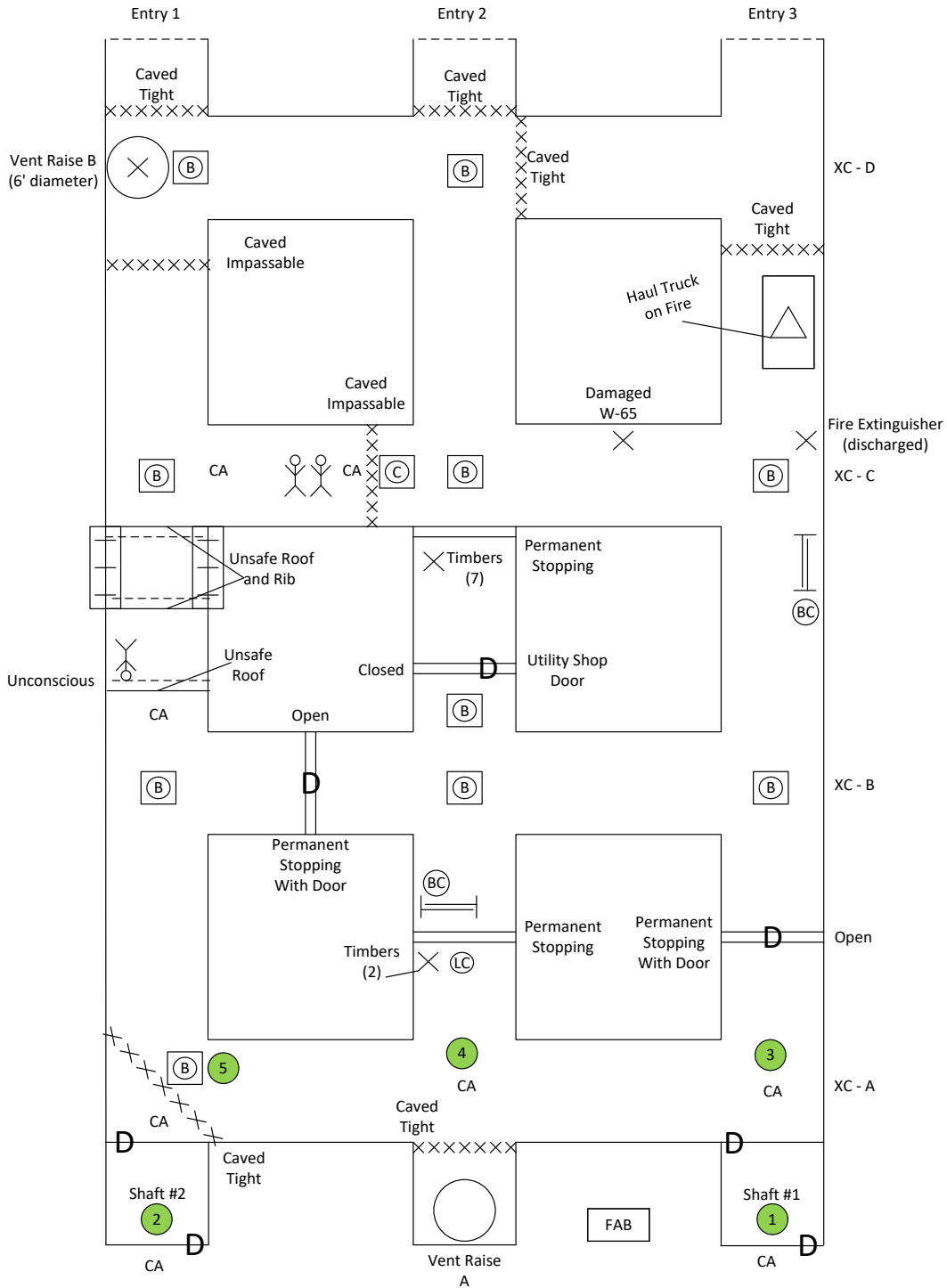
Team Stop #5

The team will continue exploration west to the next intersection. Examining the intersection, they will identify a “B” gas placard (see map for concentrations). The team will also identify the backside of the “caved tight” in Entry 1.

Solution Map Day 1

Team Name: _____

Team Draw # _____



Gas Placard Key	
CA = Clear Air	⊙ = O ₂ - 17%
⊕ = O ₂ - 16%	⊖ = CO - 0.11%
⊗ = CO - 0.14%	⊘ = NO ₂ - .0028%
⊙ = NO ₂ - .0018%	⊚ = CH ₄ - 0%
⊚ = CH ₄ - 0%	



Team Stop #6

The team will continue exploration north in Entry 1 until they reach the intersection of XC-B and identify a “B” gas placard. Stretching east in XC-B the team will identify a “permanent stopping with door” and it will be open. Stretching north in Entry 1, the team will identify a placard indicating “clear air”, they will also identify a placard indicating “unsafe roof”. The team will see that a missing survivor is lying near the unsafe roof demarcation.

Note: Continuing exploration beyond the potential survivor will result in (50 discounts) per Judge 1 – UG Rule 18(e).

Team Stop #7

The team will have the means to support a portion of the area to access the survivor. Utilizing the techniques outlined in figure 6 (2019-2020 Contest Rules) the team will install the timbers and assess the survivor. They identify “Bill E. Jean”, he is unconscious and it will be necessary for the team to backboard and provide Bill with full face respiratory protection to transport him to surface.

Note: Not properly protecting survivor will result in (50 discounts) per Judge 1 – UG Rule 18(d)

Team Stop #8

The team will return into the mine and continue exploration east in XC-B until they reach the intersection of Entry 2, here they identify a “B” gas placard. Stretching south they identify “brattice cloth and brattice frames (1)”, they also identify the back side of the “permanent stopping”. Stretching north they identify another “B” gas placard and “utility shop door” it will be closed. Knocking on the door the team will receive no response.

Team Stop #9

The team will continue exploration east in XC-B until they reach the next intersection. They identify a “B” gas placard. Stretching south they identify the backside of the permanent stopping with door.

Team Stop #10

The team will continue exploration north in Entry 3 until they reach the intersection of XC-C, along the way they identify “brattice cloth and brattice frames (1)”. At the intersection they identify a “B” gas placard and “fire extinguisher (discharged)”. Stretching north the team will identify a “haul truck on fire”, it will be necessary for the teams to utilize two team members with two fire extinguishers (2/3 sweeping method) in order to extinguish the obstacle fire. Done correctly this method will extinguish the fire and the team will examine around the front of the haul truck and identify “caved tight”.

Team Stop #11

The team continue exploration west in XC-C until they reach the next intersection. Along the way they identify a “damaged W-65”. At the intersection, they identify a “B” gas placard and “permanent stopping”. Stretching west, they identify another “B” gas placard and “caved impassable”.

Team Stop #12

The team will continue exploration north in Entry 2 until they reach the intersection of XC-D, here they identify a “B” gas placard. To the east they identify “caved tight” and to the north they identify “caved tight”.

Team Stop #13

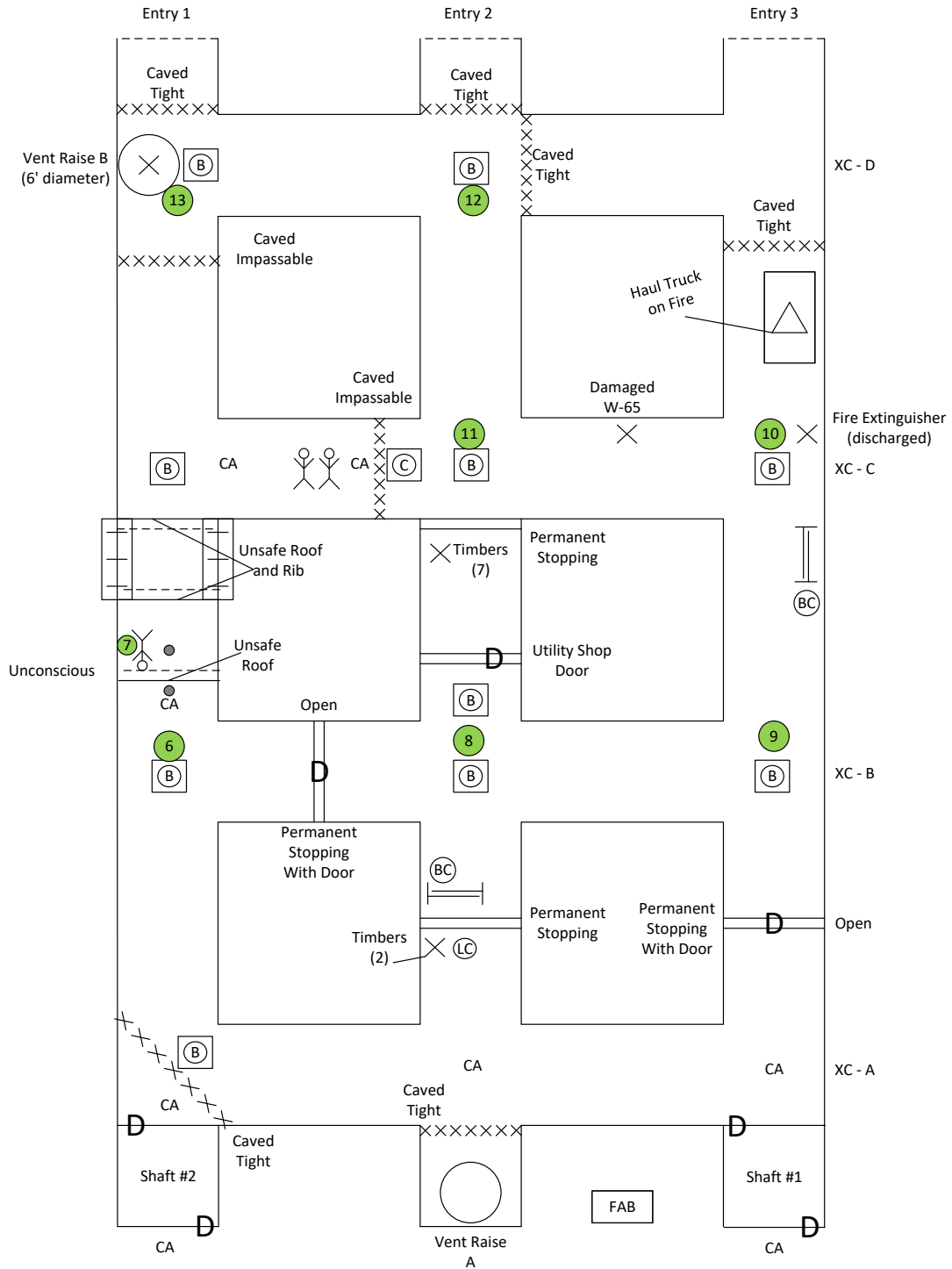
The team will continue exploration west until they reach the intersection of Entry 1. The team will identify “B” gas placard and “vent raise B (6’ diameter)”. Examining north the teams will identify “caved tight” and stretching south they will identify “caved impassable”.

The team has explored all accessible areas of the mine to this point and will execute their first ventilation change to enter the utility shop. If the team requests an update on the #1 shaft fan, they will informed that it is still out of service. The team should remember that the fan located at the top of Vent Raise B is operational and can be turned on upon request.

Solution Map Day 1

Team Name: _____

Team Draw # _____



Gas Placard Key	
CA = Clear Air	⊙ = O ₂ - 17%
⊕ = O ₂ - 16%	⊖ = CO - 0.11%
⊗ = CO - 0.14%	⊘ = NO ₂ - .0028%
⊙ = NO ₂ - .0018%	⊚ = CH ₄ - 0%
⊚ = CH ₄ - 0%	



Ventilation Change #1 Enter the Utility Shop (See attached map)

The team will request a ventilation change, once granted the following steps will be required to clear the area in front of the Utility Shop.

- Build a temporary stopping in XC-C between Entry 1 and 2
- Build a temporary stopping in Entry1 between XC-B and XC-C
- Close the door between XC-A & XC-B in Entry 3
- Request the fan at Vent Raise B be turned “ON”
- Team will need to utilize the line curtain to course air up to the Utility Shop door.

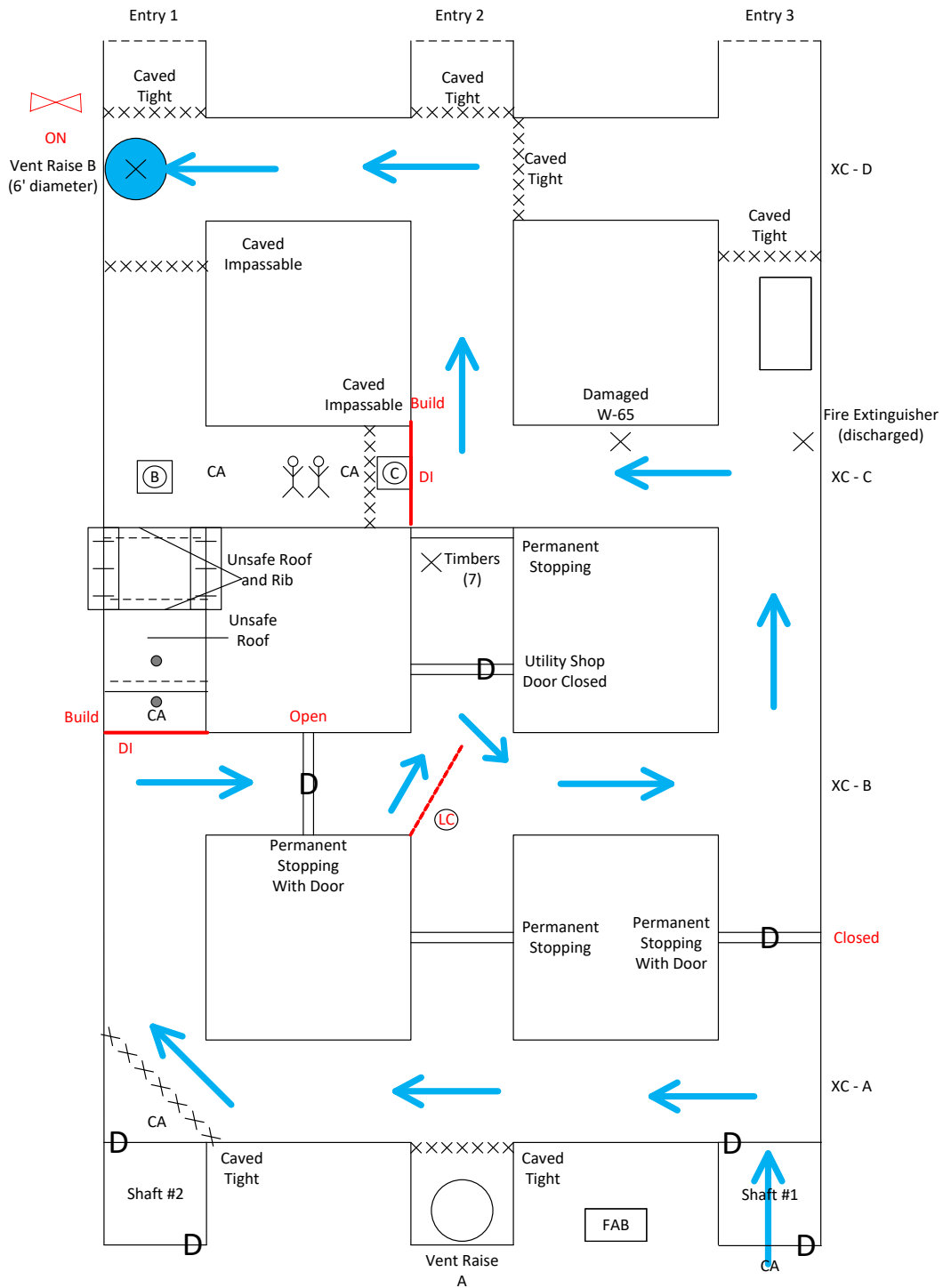
Note: Ventilation path is indicated by blue arrows on the map. The ventilation will clear the XC and line curtain will course air up to the Utility Shop door.

Note: Upon reentry into areas cleared of smoke and toxic or dangerous gasses, teams shall make gas tests rib to rib at all openings along the route they travel.

Ventilation Change #1 (Enter Utility Shop)

Team Name: _____

Team Draw # _____



Gas Placard Key	
CA = Clear Air	⊙ = O ₂ - 17%
⊙ = O ₂ - 16%	⊙ = CO - 0.11%
⊙ = CO - 0.14%	⊙ = NO ₂ - .0028%
⊙ = NO ₂ - .0018%	⊙ = CH ₄ - 0%
⊙ = CH ₄ - 0%	

- Ventilation Change #1**
- Build Temp stopping in XC-C between Entry 1 & 2
 - Build Temp Stopping in Entry 1 between XC-B and XC-C
 - Close door between XC-A & XC-B in Entry 3
 - Request to turn the fan "ON" at Vent Raise B
 - Team will need to utilize the line curtain to course the air up to the Utility Shop



Note: The team may elect to turn the fan “OFF” prior to continuing exploration. In the event the team leaves the fan running and they remove the temporary stopping in XC-C between Entry 1 & 2, they will make a ventilation change without knowing its effects. This ventilation change will move the IDLH across the remaining survivors.

Team performing an act that may result in death or injury of survivor(s). (50 discounts) each infraction per Judge No.1 – UG Rule #18(b)

Team Stop #14

The team does not know the conditions behind the door and they received no response when they knocked on the door. The team will be required to erect a temporary stopping to enter the utility shop. The team will construct the temp stopping and enter the shop, identifying only “timbers (7)”. The team will have the means to continue supporting the unsafe area in Entry 1 to continue exploration.

Team Stop #15

The team will return to Entry 1. Entering the supported area, they identify “unsafe roof and rib”. The team will need to utilize dual supports to continue exploration. Utilizing the ground control techniques as outlined in the rule book, the team will successfully support the entire area.

Team Stop #16

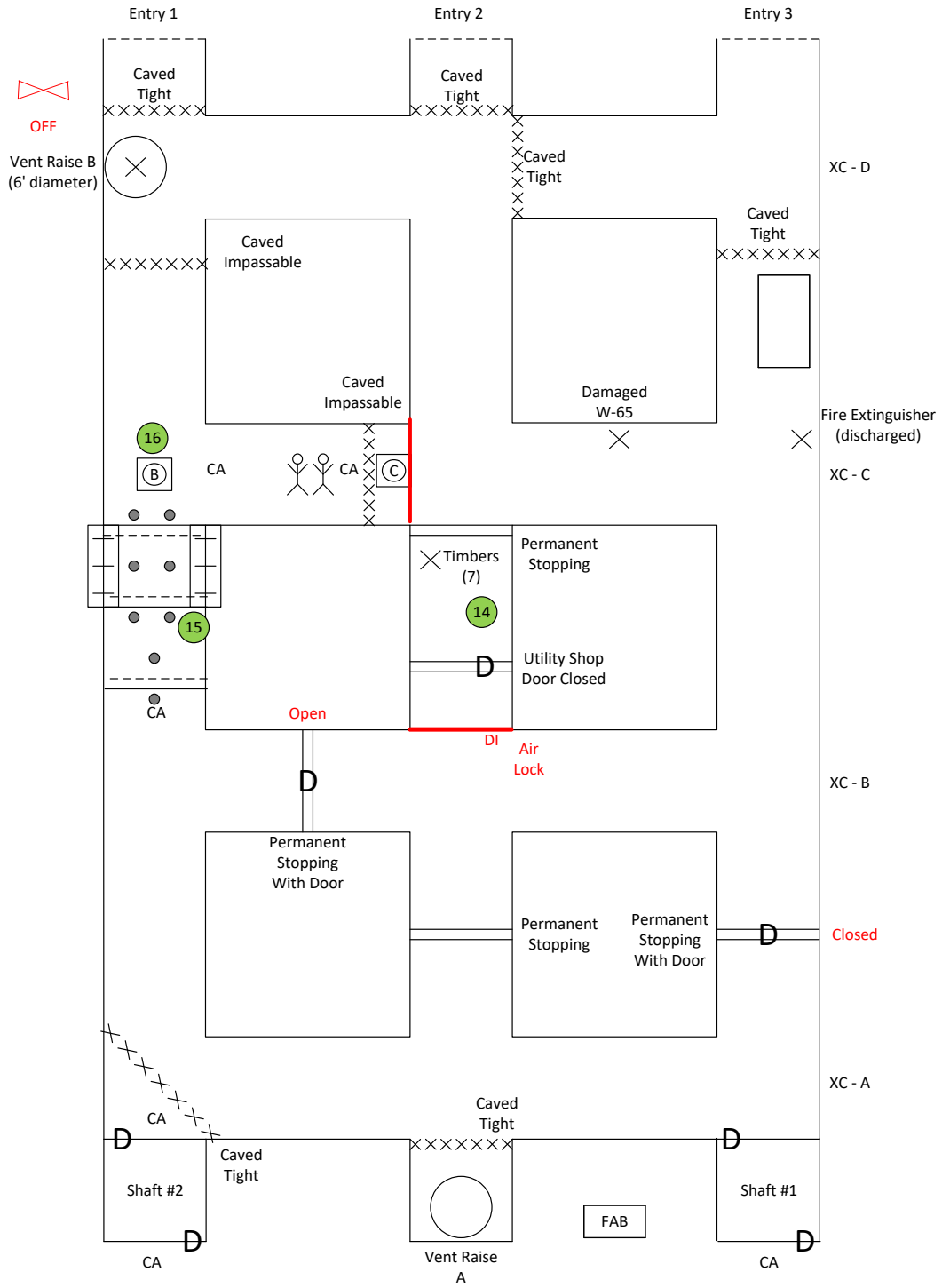
The team will continue exploration north in Entry 1 until they reach the intersection of XC-C. The team will identify a “B” gas placard. Stretching north they will identify “caved impassable”. Exploring east in XC-C, the team will identify a “clear air” placard and find the two remaining survivors. “Mark Fireball” and “Rob Erts” are unharmed and can walk out with the team. The team will take both survivors to surface and transfer care to EMS. THE END!

Note: Due to the gas concentrations in Entry 1, the team will need to provide proper respiratory protection for both survivors. In the event the team does not have the ability to provide both survivors protection, the team will need to execute ventilation change #2.

Solution Map Day 1

Team Name: _____

Team Draw # _____



Gas Placard Key	
CA = Clear Air	⊙ = O ₂ - 17%
⊖ = O ₂ - 16%	⊙ = CO - 0.11%
⊖ = CO - 0.14%	⊙ = NO ₂ - .0028%
⊖ = NO ₂ - .0018%	⊙ = CH ₄ - 0%
⊖ = CH ₄ - 0%	



Ventilation Change #2 Rescue remaining survivors (See attached map)

The team will request a ventilation change, once granted the following steps will be required to clear the area in front of the Utility Shop.

- Maintain the temporary stopping in XC-C between Entry 1 & 2 on east side of caved impassable
- (Optional) Build a temporary stopping in XC-C between Entry 1 & 2
- Close the door between Entry 1 & 2 in XC-B
- Close the door between Entry XC-A & XC-B in Entry 3
- Request the fan at Vent Raise B be turned “ON”

Note: Ventilation path is indicated by blue arrows on the map. The ventilation will clear Entry 1.

Note: Upon reentry into areas cleared of smoke and toxic or dangerous gasses, teams shall make gas tests rib to rib at all openings along the route they travel.

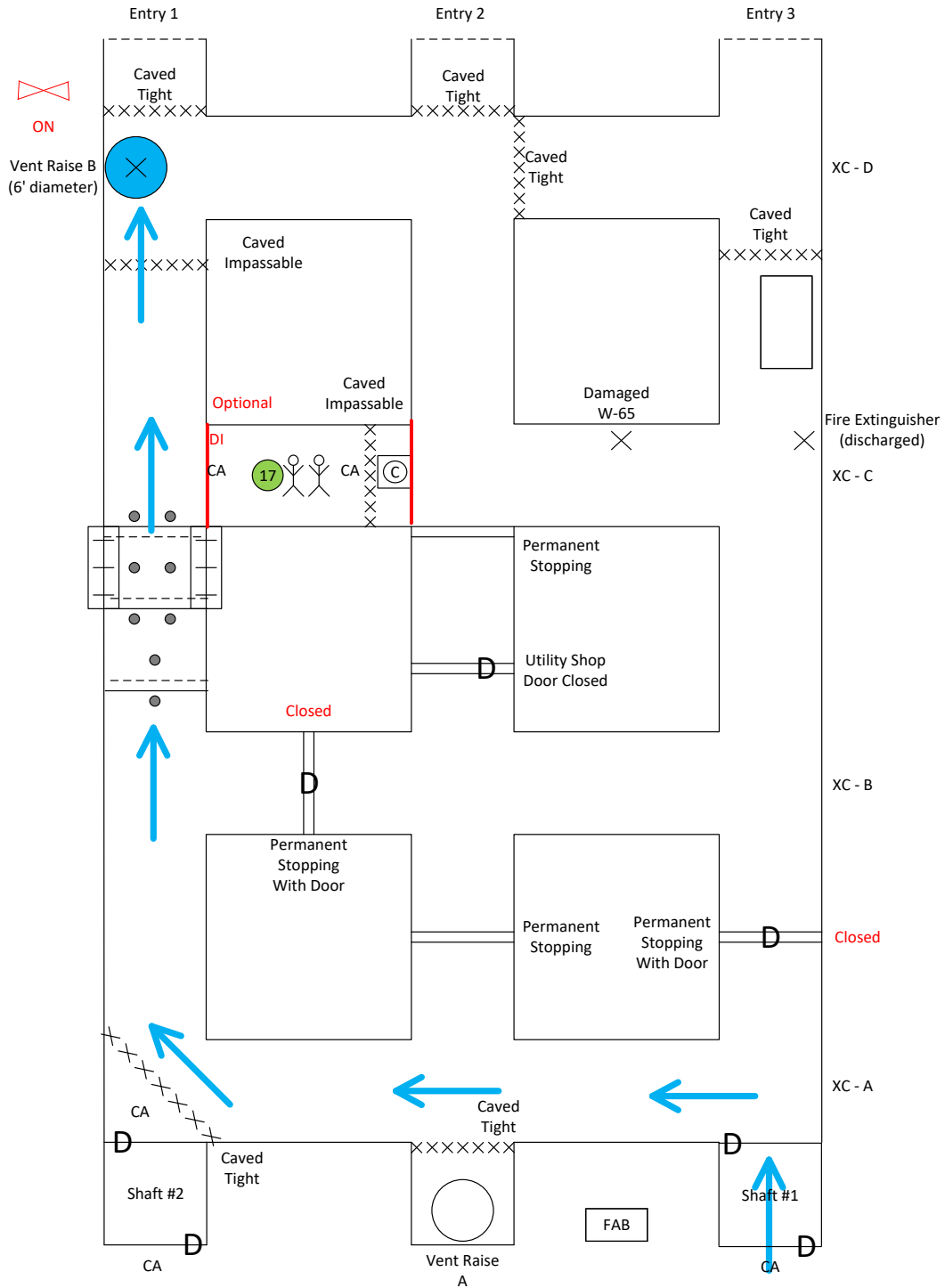
Team Stop #17

The team will access the two survivors, they will have a clear air path back to surface and can walk both survivors to the FAB and transfer care to EMT's. THE END!

Ventilation Change #2 Rescue Remaining Survivors

Team Name: _____

Team Draw # _____



Gas Placard Key	
CA = Clear Air	⊙ = O ₂ - 17%
⊖ = O ₂ - 16%	⊙ = CO - 0.11%
⊖ = CO - 0.14%	⊙ = NO ₂ - .0028%
⊖ = NO ₂ - .0018%	⊙ = CH ₄ - 0%
⊖ = CH ₄ - 0%	

- Ventilation Change #2
- Maintain the Temp stopping in XC-C between Entry 1 & 2 on east side of caved impassable
 - (Optional) Build a Temp Stopping in XC-C between Entry 1 & 2
 - Close the door between Entry 1 & 2 in XC-B
 - Close the door between XC-A & XC-B in Entry 3
 - Request to turn the fan "ON" at Vent Raise B



Placard Map

Team Name: _____

Team Draw # _____

