50Th Annual Southern Regional Mine Rescue Contest

JUDGE PACKET

Field Competition Day 1

May 2, 2023

New Iberia, Louisiana

Mine Information
New Iberia, LA
May 2 - 3, 2023

General
The Gator Mine is an underground Multi-level Category II-A room and pillar salt mine. The mine is owned and operated by Al Gator. The mine is located in Southern Louisiana and is active and operating at full capacity. The mine operates two 12-hour shifts per day, 6 days a week. Hours of operation are from 7 am to 7 pm on day shift and 7 pm to 7 am on nights. All production is on the 1200' level.

Mine Access
Mine access is provided by two 14-foot diameter steel-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 16 feet and working areas of the mine are 10 feet by 10 feet with back heights averaging 26 feet.

Explosives
All explosives are stored on the 1200' level in an approved storage facility. All shots are performed from surface with no employees underground per the 30 CFR.

Electricity
Electrical service to the mine is provided by Bayou Electric with the main disconnects located on surface. All face equipment in the mine is permissible. Power centers are located underground for mining equipment.

Gas
The mine is a gas category II-A (Subcategory II-A applies to Domal salt mines where an outburst reportable under 57.22004 (c) (1) has occurred. The mine generally experiences some nitrogen dioxide and carbon monoxide resulting from blasting and the operation of diesel equipment. The mine has a mine wide atmospheric monitoring system.

Communication
This is accomplished by two-way radios that are carried by mine personnel and battery mine phones strategically placed around the mine. The battery mine phones are not intrinsically safe.

Ground Control
Ground control is maintained with 6-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 hoisted to surface, screened and loaded to be shipped to the northeast part of the country.

Mine Maps
The mine maps were last updated on February 1, 2023.

Mine Equipment
The mine currently utilizes under-cutters, face drills, haul trucks, loaders, bolters, battery operated scoops, and other smaller diesel-powered equipment for transportation.

Ventilation
The mine is ventilated by a non-reversible 350,000 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. Three 6-foot ventilation shafts are located in the mine and are identified on the map.

Water
Water flows into the mine via seepage on the 1200’ level and accumulates primarily in the eastern part of the mine. There are two sumps in the mine known as Sump A and Sump B with submersible pumps. An 8” suction line runs underground, and water is pumped to surface via the exhaust shaft.

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 Day 1

New Iberia, LA

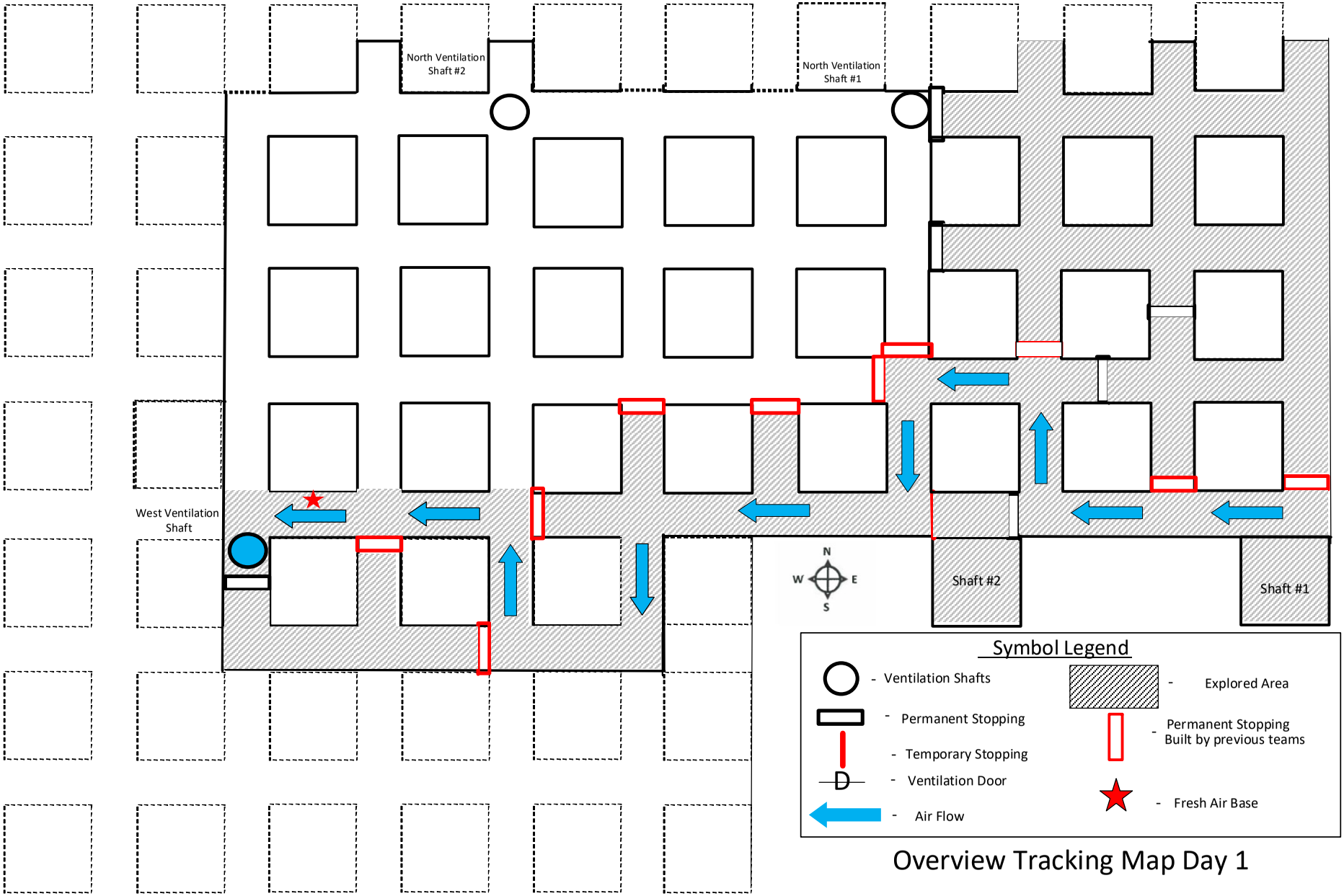
May 2, 2023

You have arrived at the Gator Mine and Al Gator, Mine Manger, provided the following information. The mine conducted their regular and routine blasting procedures last night, after the blast the atmospheric monitoring system lost power unexpectedly while waiting for the mine to clear. We expected the battery backup system to automatically take over, but we could not get the system back up and running. After waiting for about 45 minutes a crew of 4 miners went into the mine to assess the conditions. The hoist operator received a call about 30 minutes later from the Mine Foreman informing him that they did identify some methane and were going to split up to cover more area of the mine. Shortly after, the hoist operator reported feeling what appeared to be some type of explosion underground, he immediately attempted to contact the foreman but was not successful. The hoist operator contacted management and reported the situation.

It is now 4:00 p.m., you will be the third team to enter the mine, the first two teams before you explored as much as they could under oxygen and have reestablished the fresh air base underground (see overview tracking map). The team was successful in finding one of the missing miners, the miner has since been transported to the hospital for further care. The mine fan is currently in the "OFF" position but can be turned "ON" at the team's request. The mine electrician is actively working to repair the atmospheric monitoring system on surface, but we do not know how long that could take. There are still 3 miners unaccounted for, 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 FAB.

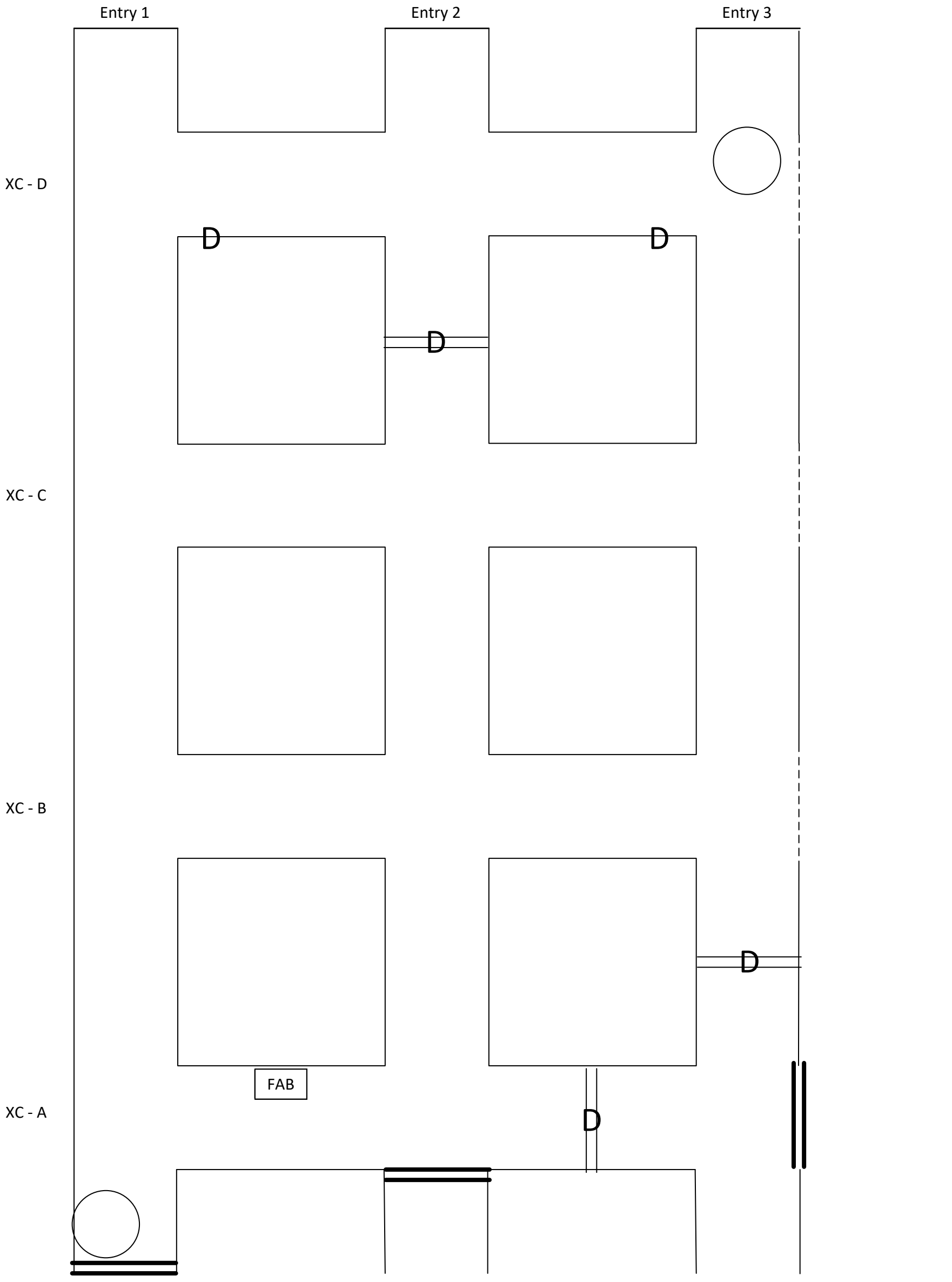


Overview Tracking Map Day 1

Team Name: _____

Team Draw # _____

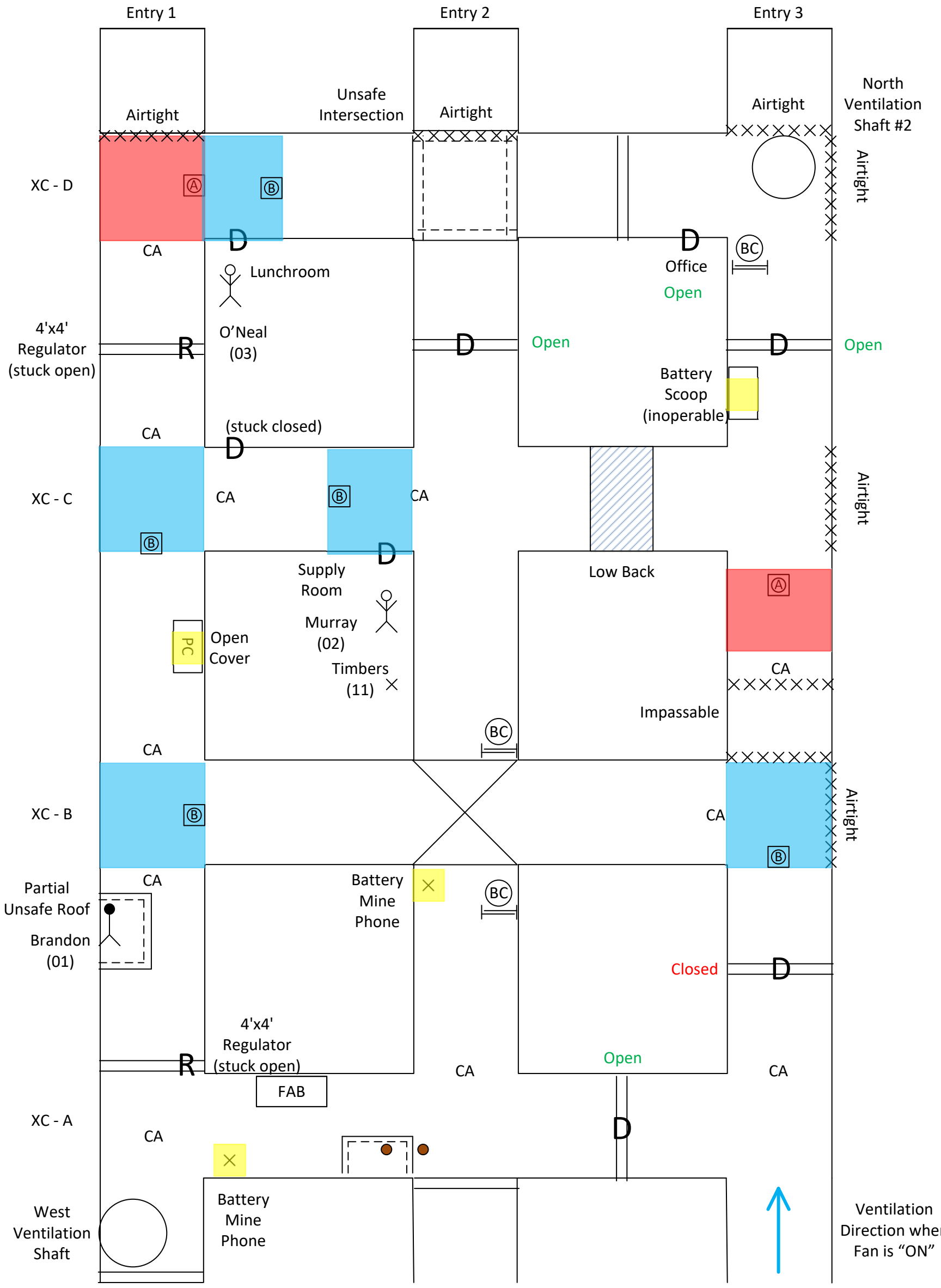
Team Map
Day 1



Team Name: _____

Team Draw # _____

Problem Map
Day 1



Gas Placard Key

CA = Clear Air

Ⓐ = O_2 – 18%
CO - 0%
CH_4 – 7.2%

Ⓑ = O_2 – 16%
CO – 0%
CH_4 – 3.2%

Southern Regional Mine Rescue Contest 2023
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 arrange their communication system and check functionality before they start the clock. Once the clock has been started the team will receive all of their maps and information.

Note: Throughout the field problem, while advancing and at the intersections the team will check for loose ground (loose roof or rib). Captain must verbally indicate he/she is checking the roof/back when constructing temporary stoppings.

Note: "Possible Infractions" are highlights of potential discounts at each team stop. These lists are not all inclusive, Judge's may identify additional discounts during the working of the field problem.

Note: Entry Examination and Team Stop No.1 (See Solution Map 1)

Note: When the team arrives at the advanced fresh air base, the area map provided by the previous team will have most of the items in the area already mapped.

Entry #1 check reveals:

The team will travel to entry 1. The team must conduct necessary gas tests. A placard at the intersection of the advanced fresh air base indicates "Clear Air." The team will identify a "Permanent Stopping (with regulator)" the regulator is 4' x 4' and stuck open. This will allow ventilation to pass through when on. The team will DI the stopping.

Possible Infractions: Failure to take necessary gas tests and Failure of the captain to "DI" at the point of farthest advance of the team.

Entry #2 check reveals:

The team will travel to the entry 2. A placard at the entrance will indicate "Clear Air." The team must conduct necessary gas tests.

Entry #3 check reveals:

The team will travel to entry 3. The team will check the entry and identify "Clear Air". Stretching north the team will identify "Permanent Stopping (with Door)", the door will be closed and the team will not have any materials to create an airlock to access entry 3 at this time. the team will take necessary gas test and DI.

Possible Infractions: Failure to take necessary gas tests and Failure of the captain to "DI" at the point of farthest advance of the team.

Team Stop #1

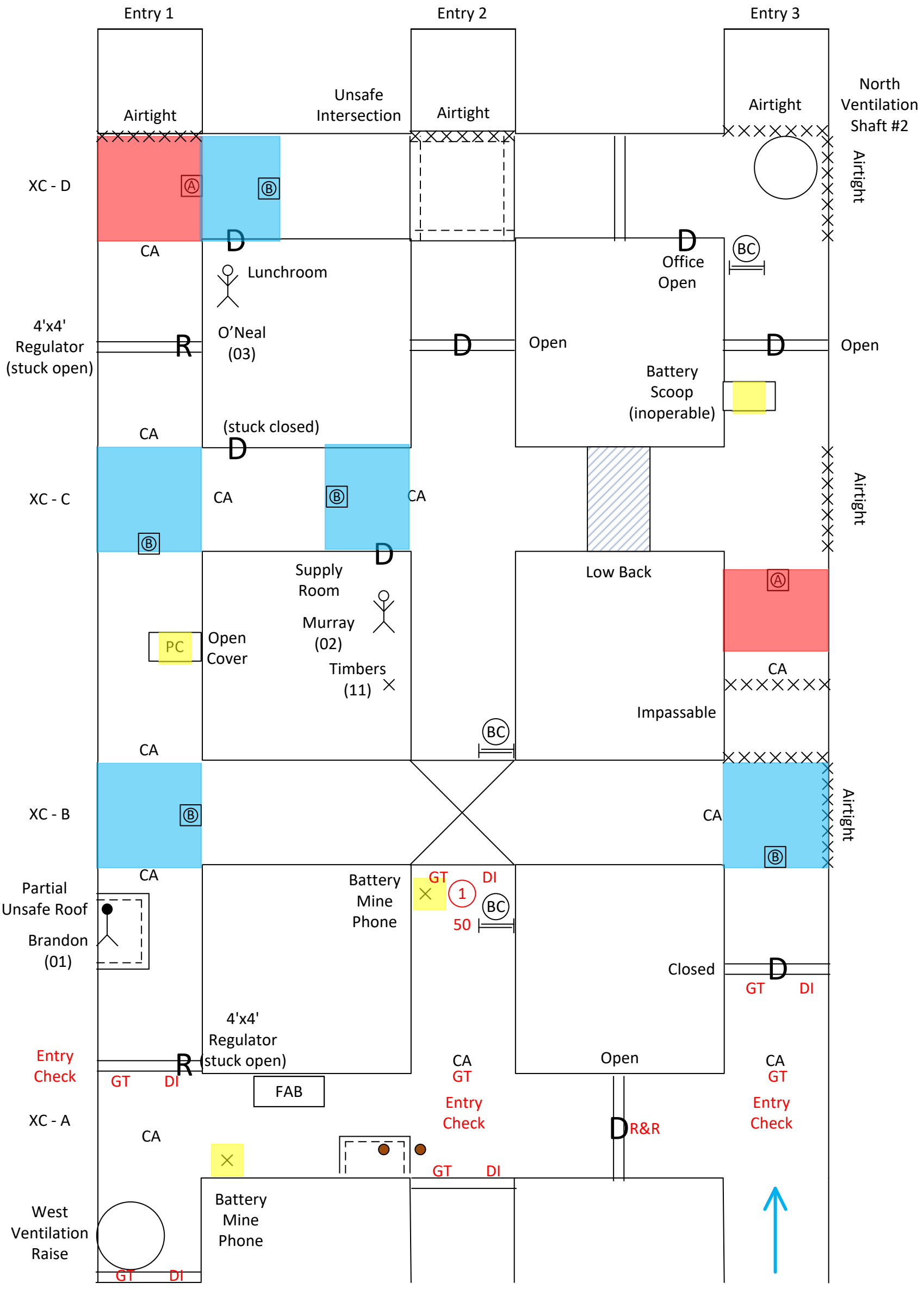
The team will return to entry 2. Exploring north the team will identify "Brattice Cloth and Brattice Frames", "Battery Mine Phone", and "Overcast" stopping. The team will also likely conduct their 50' check in this area. The team will conduct the necessary gas test and DI.

Possible Infractions: Failure to take necessary gas tests and Failure of the captain to "DI" at the point of farthest advance of the team. Failure to conduct a 50'check.

Team Name: _____

Team Draw # _____

Entry Examinations and Team Stop No. 1 Solution Map 1



Gas Placard Key

CA = Clear Air

A = O_2 – 18%
CO - 0%
CH_4 – 7.2%

B = O_2 – 16%
CO – 0%
CH_4 – 3.2%

Note: Team Stop Nos. 2 – 5 (See Solution Map 2)

Team Stop #2
The team will utilize the building materials to create an airlock and continue exploration north in entry 3 until they reach the intersection of XC-B. The team will conduct the necessary gas test and identify a "B" gas placard (see map for concentrations) and "Clear Air" separation. The team also identifies "Caved" airtight and "Caved" impassable.

Possible Infraction: Failure to take necessary gas tests, Failure of the captain to "DI", failure to check area prior to erecting the temporary stopping, and failure to check roof/rib while advancing through the door.

Team Stop #3
The team will continue exploration west in XC-B until they reach the intersection of entry 2. The team will conduct the necessary gas test. At the intersection the team will identify "Overcast".

Possible Infractions: Failure to take necessary gas tests and Failure of the captain to "DI".

Team Stop #4
The team will continue west in XC-B until they reach the intersection of entry 1. At the intersection they will identify a "B" gas placard, and the "Clear Air" separation. The team will conduct the necessary gas test. Stretching south the team will identify "Partially Unsafe Roof" and make visual contact with a missing miner. The team will not have the means to support the area and rescue the miner at this time.

Possible Infraction: Failure to take necessary gas tests, Failure of the captain to "DI", and team member stepping under unsafe roof.

Team Stop #5
The team will continue exploration north in entry 1 until they reach the intersection of XC-C. While advancing the team will identify "Power Center" with an open cover. At the intersection, the team will conduct the necessary gas tests. The team will identify a "B" gas placard and "Clear Air" separation. Stretching north the team will identify a "Permanent Stopping (with regulator)" the regulator is 4' x 4' and stuck open. On the corner of the pillar the team will identify a "Door (stuck closed)", knocking on the door the team will make verbal contact with a missing miner inside. The miner will relay the following information. "Get me out of here, I'm not injured, this room is completely enclosed, and the air in here is ok. But the door you're at will not open". The team will have to continue exploration.

Possible Infractions: Failure to take necessary gas tests and Failure of the captain to "DI".

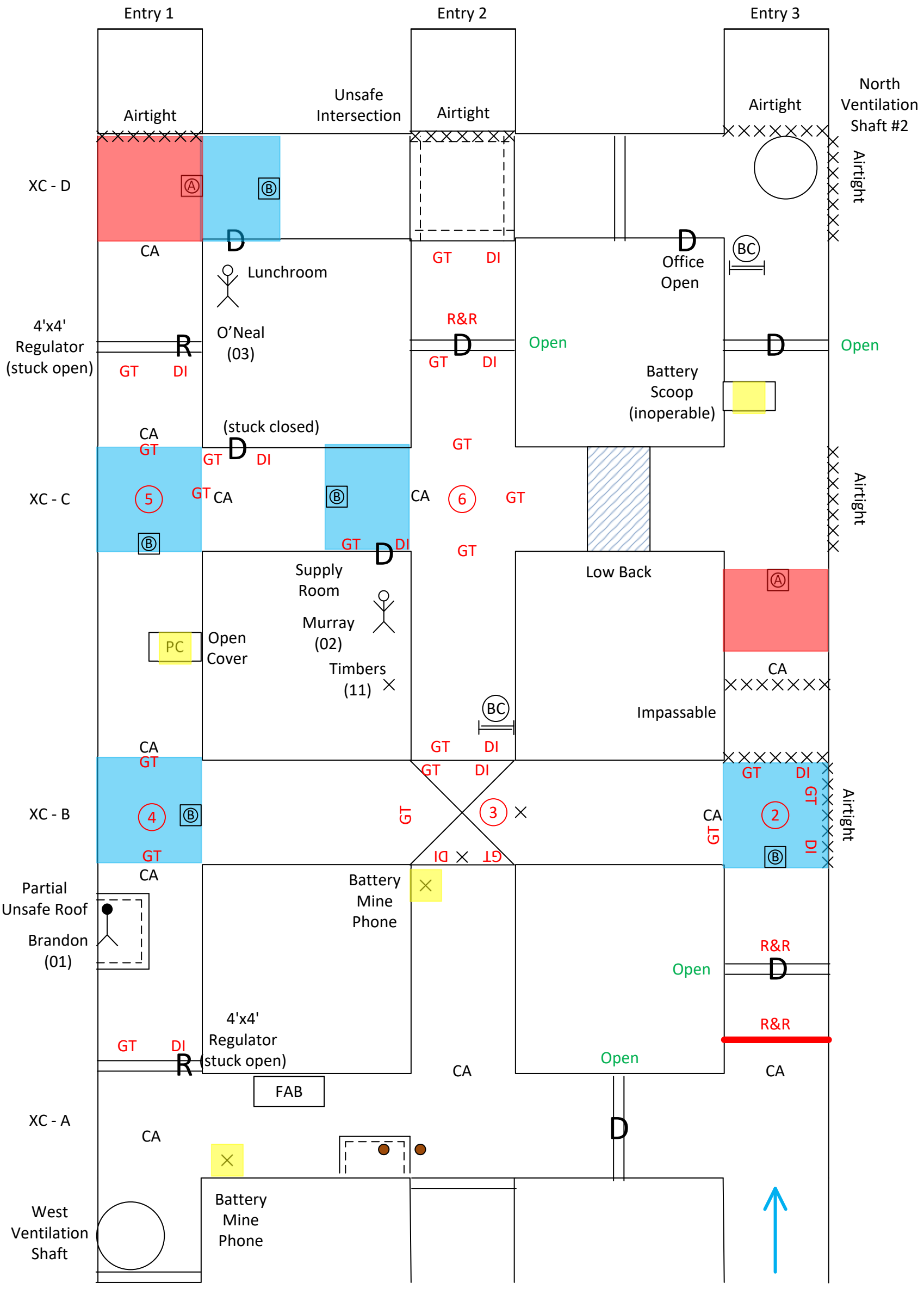
Team Stop #6
The team will continue exploration east in XC-C until they reach the intersection. While advancing the team will identify a "B" gas placard, "Supply Room Door" (closed), and a "Clear Air" separation. knocking on the door the team will make verbal contact with a missing miner inside. The miner will relay the following information. "Get me out of here, I'm not injured, this room is completely enclosed, and the air in here is ok". Due to the gas concentrations in front of the door the team will need to ventilate the area first to enter the room. The team will have to continue exploration. At the intersection the team will take the necessary gas test. Stretching south the team will identify "Brattice Cloth and Brattice Frames" and "Overcast" stopping. Stretching north the team will identify a "permanent stopping with door" door open. Beyond the door the team will identify "unsafe intersection". Stretching east the team will identify "Low Back".

Possible Infraction: Failure to take necessary gas tests, Failure of the captain to "DI", failure to check roof/rib while advancing through the door, and team members stepping into unsafe intersection.

Team Name: _____

Team Draw # _____

Solution Map 2
Team Stop No. 2 - 6



Gas Placard Key

CA = Clear Air

Ⓐ = O_2 – 18%
CO - 0%
CH_4 – 7.2%

Ⓑ = O_2 – 16%
CO – 0%
CH_4 – 3.2%

N W E S

Note: Team Stop Nos. 7 – 8 (See Solution Map 3)

Team Stop #7

The team will continue exploration east underneath the low back area until they reach the intersection of Entry 3. The team will conduct the necessary gas test. The team will identify that east has "Caved" airtight. Stretching south the team will identify an "A" gas placard (see map for concentrations). This will indicate an explosive air/gas mixture and the team will need notify the FAB. The team will also identify "Clear Air" separation next to the "Caved" impassable. Stretching north the team will identify "Battery Scoop (inoperable) and a "permanent Stopping with door" the door will be open.

Possible Infractions: Failure to take necessary gas tests and Failure of the captain to "DI" at the point of farthest advance of the team, Failure to notify the FAB of an air/gas mixture that's reached its explosive rang, and if not stated at the beginning of the problem that the team has non-sparking tools, they will need to make a request for them.

Team Stop #8

The team will continue exploration north in entry 3 until they reach the intersection of XC-D. while advancing the team will identify "Brattice Cloth and Brattice frames", "North Vent Shaft #2", "Caved" airtight north/east, and "Office Door" open. The team will explore the office. Stretching west the team will identify a "Permanent Stopping".

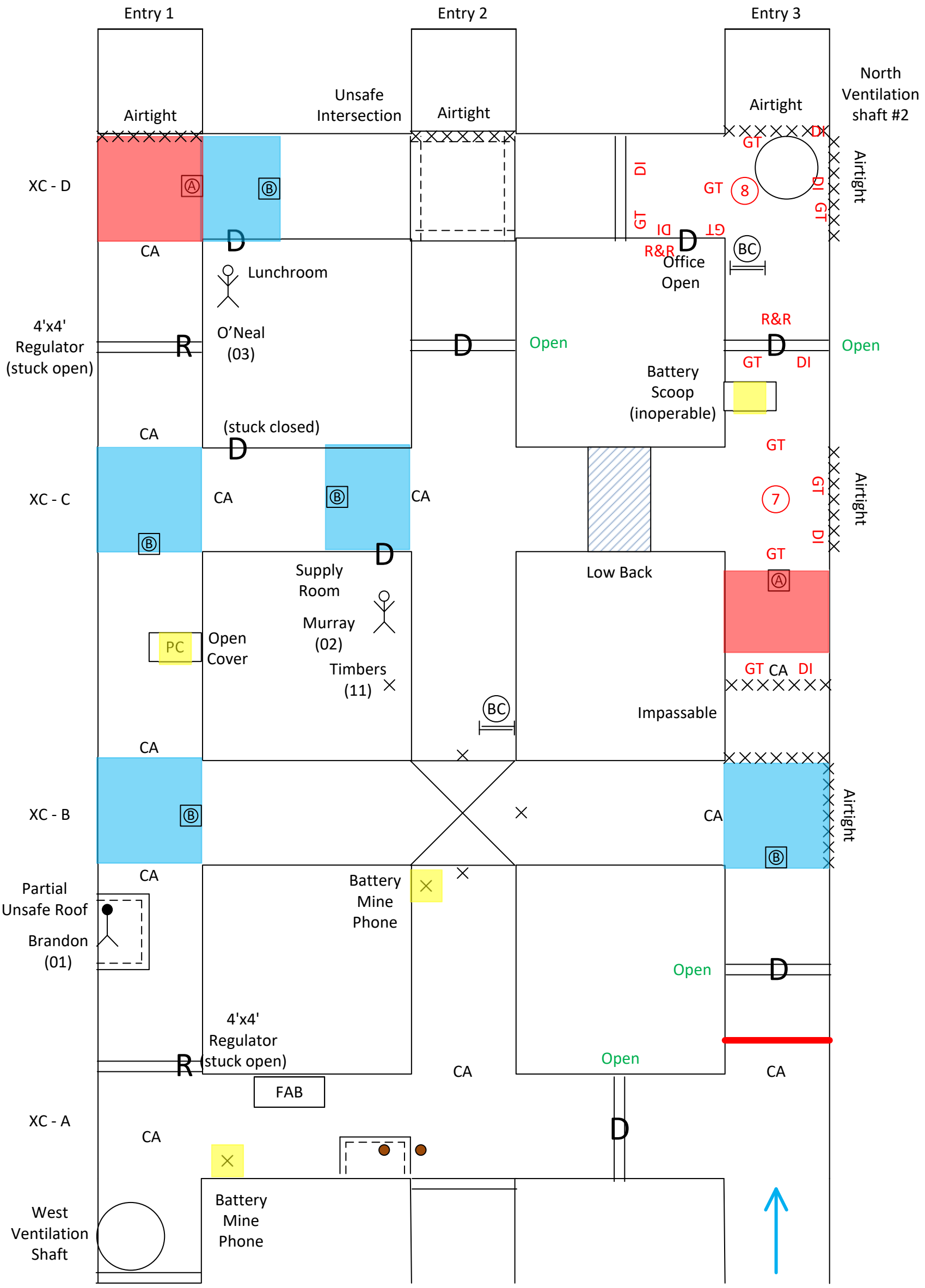
Possible Infractions: Failure to take necessary gas tests, Team member exposed underneath vent shaft, Failure of the captain to "DI", and Failure to check roof/rib when traveling through the door.

Note: The team now has all the necessary mean to execute the first ventilation change to rescue the missing miner in the supply room.

Team Name: _____

Team Draw # _____

Solution Map 3
Team Stop No. 7 - 8



Gas Placard Key

CA = Clear Air

Ⓐ = O_2 – 18%, CO - 0%, CH_4 – 7.2%

Ⓑ = O_2 – 16%, CO – 0%, CH_4 – 3.2%

N W E S

Note: Ventilation Change #1 and Team Stop No. 9-10 (See Solution Map 4)

Note: The team will have the means and have explored enough to isolate a path to execute ventilation change #1 and rescue a missing miner.

Ventilation Change #1

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

- Relocate FAB (see map) to protect from irrespirable.
- Build Temporary Stopping in entry 3 between XC-C & XC-B.
- Close Door in entry 3 between XC-C & XC-D.
- Close Door in entry 2 between XC-C & XC-D.
- Build Temporary Stopping in entry 1 between XC-C & XC-D
- Build Temporary Stopping in entry 1 between XC-A & XC-B (protect miner)
- Close door in XC-A next to FAB
- Turn the fan to the "ON" position.

Note: Ventilation path is indicated by blue arrows on the map and will clear gases along this path.

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 #9

The team has cleared the contaminant in from of the Supply Room Door. Team will enter and identify "Murray (02)", the miner is not injured and can walk out with the team. The team will also examine the rest of the room and identify "Timbers (11)". The team will take the timbers. The team will take the miner to the FAB, turn him over to EMS, and have the fan returned to the "OFF" position.

Possible Infractions: Failure to take necessary gas tests and Failure of the captain to "DI" door and survivor, and the team performing an act that may result in death or injury of survivor.

Team Stop #10

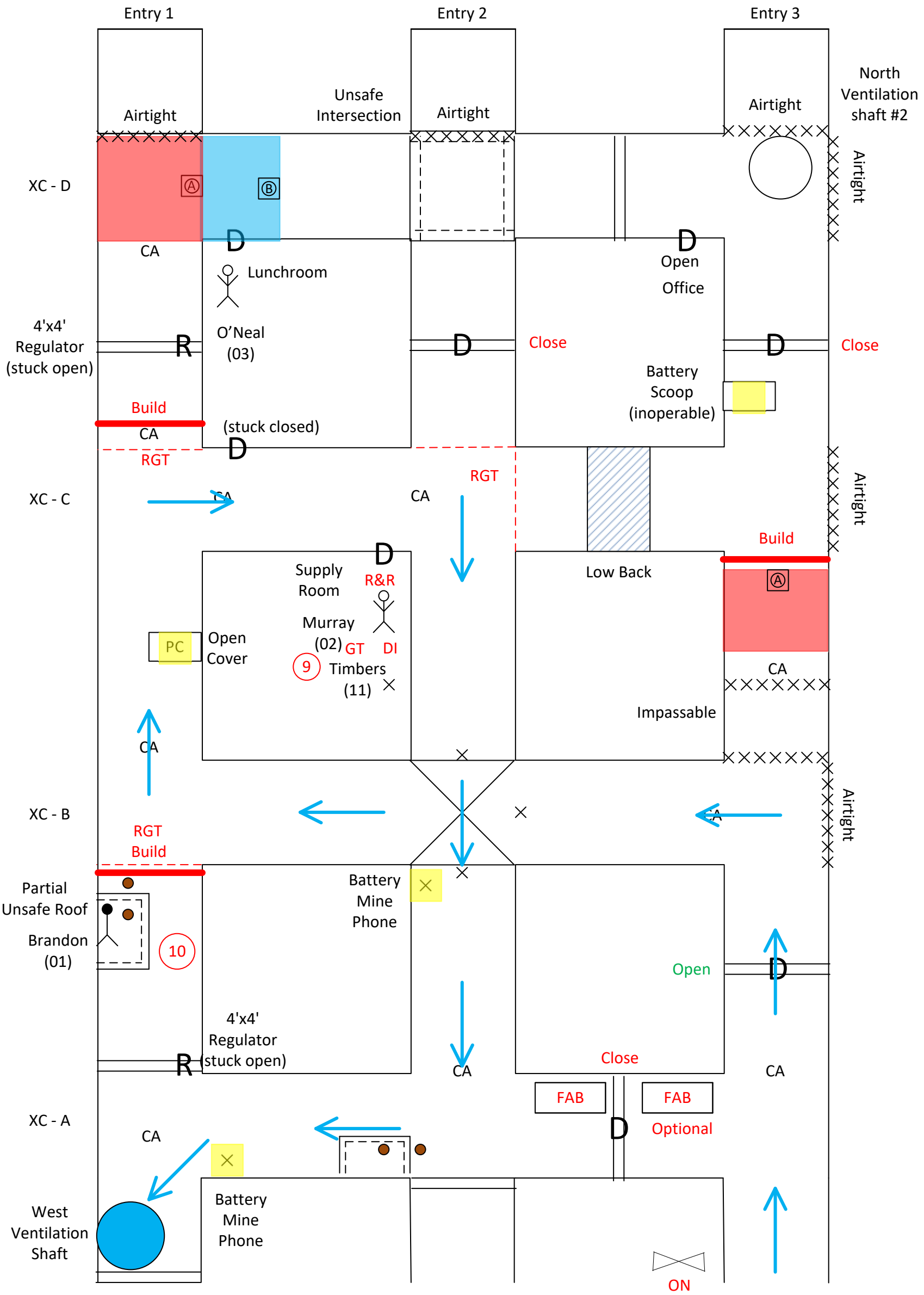
The team will have the means to support the partial unsafe roof and access the missing miner. The team will only need to install 2 supports to access the miner's upper body. The team will identify "Brandon (01)" the miner is deceased.

Possible Infractions: Failure of the captain to "DI", Improper roof support, and Captain or team member doing anything to endanger himself/herself.

Team Name: _____

Team Draw # _____

Solution Map 4
Ventilation Change 1
Team Stop No. 9 - 10



Gas Placard Key

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CO - 0%
CH_4 – 7.2%

Ⓑ = O_2 – 16%
CO – 0%
CH_4 – 3.2%

N W E S

Note: Team Stop No. 11-12 (See Solution Map 5)

Team Stop #11

The team will return to entry 2. The team has the means to support the unsafe intersection and facilitate safe travel to examine toward the lunchroom door. The team will utilize 8 timbers and travel in between the timbers to the intersection of XC-D. The team will identify that north is "Caved"(airtight) and they will not have enough timbers to safely enter and examine any further. The team will have to mark FPA and mark this area on their maps, this area will remain inaccessible.

Possible Infractions: Failure to take necessary gas tests and Failure of the captain to "DI", Improper roof support, and Captain or team member doing anything to endanger himself/herself.

Team Stop #12

The team will continue exploration west in XC-D until they reach the intersection of entry 1. The team will take the necessary gas tests. While advancing the team will identify a "B" gas placard, "Lunchroom Door", an "A" gas placard, "Caved (Airtight)", and the "Clear Air" separation. knocking on the door the team will make verbal contact with a missing miner inside. The miner will relay the following information. "Get me out of here, I'm not injured, this room is completely enclosed, and the air in here is ok". Due to the gas concentrations outside of the door the team must ventilate first. Stretching south in entry 1, the team will identify the backside of the "Permanent Stopping with regulator" 2'x2' regulator stuck open.

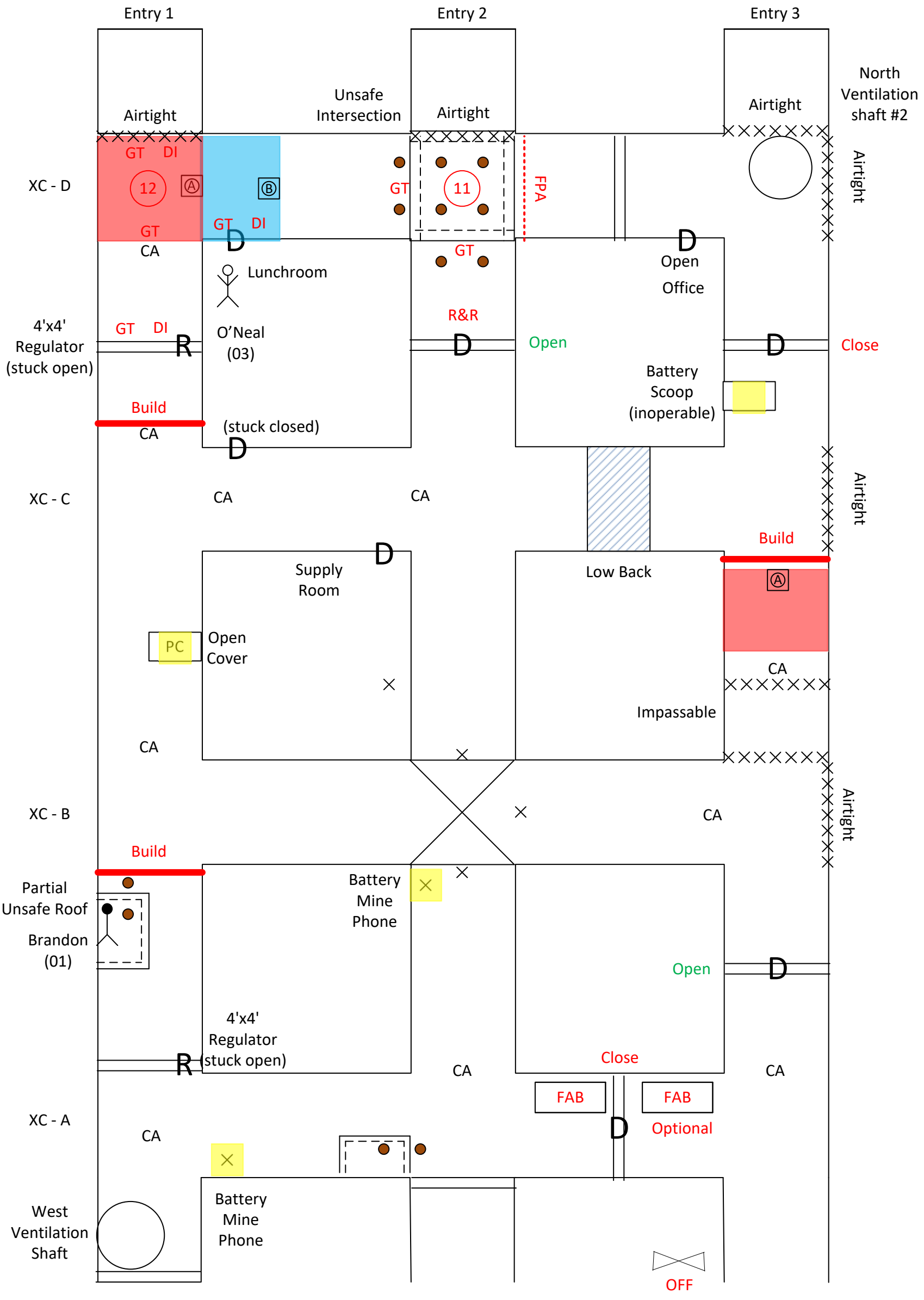
Possible Infractions: Failure to take necessary gas tests and Failure of the captain to "DI".

The team has explored all accessible areas of the mine and now has the means to execute ventilation change #2 to enter the Lunchroom and rescue the final missing miner.

Team Name: _____

Team Draw # _____

Solution Map 5
Team Stop No. 11 - 12



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CO - 0%
CH_4 – 7.2%

Ⓑ = O_2 – 16%
CO – 0%
CH_4 – 3.2%

Note: Ventilation Change #2 and Team Stop No. 13 (See Solution Map 6)

Ventilation Change #2

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

- Relocate Battery Mine Phones (see map) to isolate ignition source.
- Close door in XC-A next to FAB
- Build Temporary Stopping in entry 1 between XC-A & XC-B.
- Maintain Door closed in entry 3 between XC-C & XC-D.
- Open Door in entry 2 between XC-C & XC-D.
- Maintain Temporary Stopping in entry 3 between XC-C & XC-B
- Build Temporary Stopping in XC-C between entry 1 and 2.
- Turn the fan to the "ON" position.

Note: Ventilation path is indicated by blue arrows on the map and will clear gases along this path.

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. (see map for possible areas RGT)

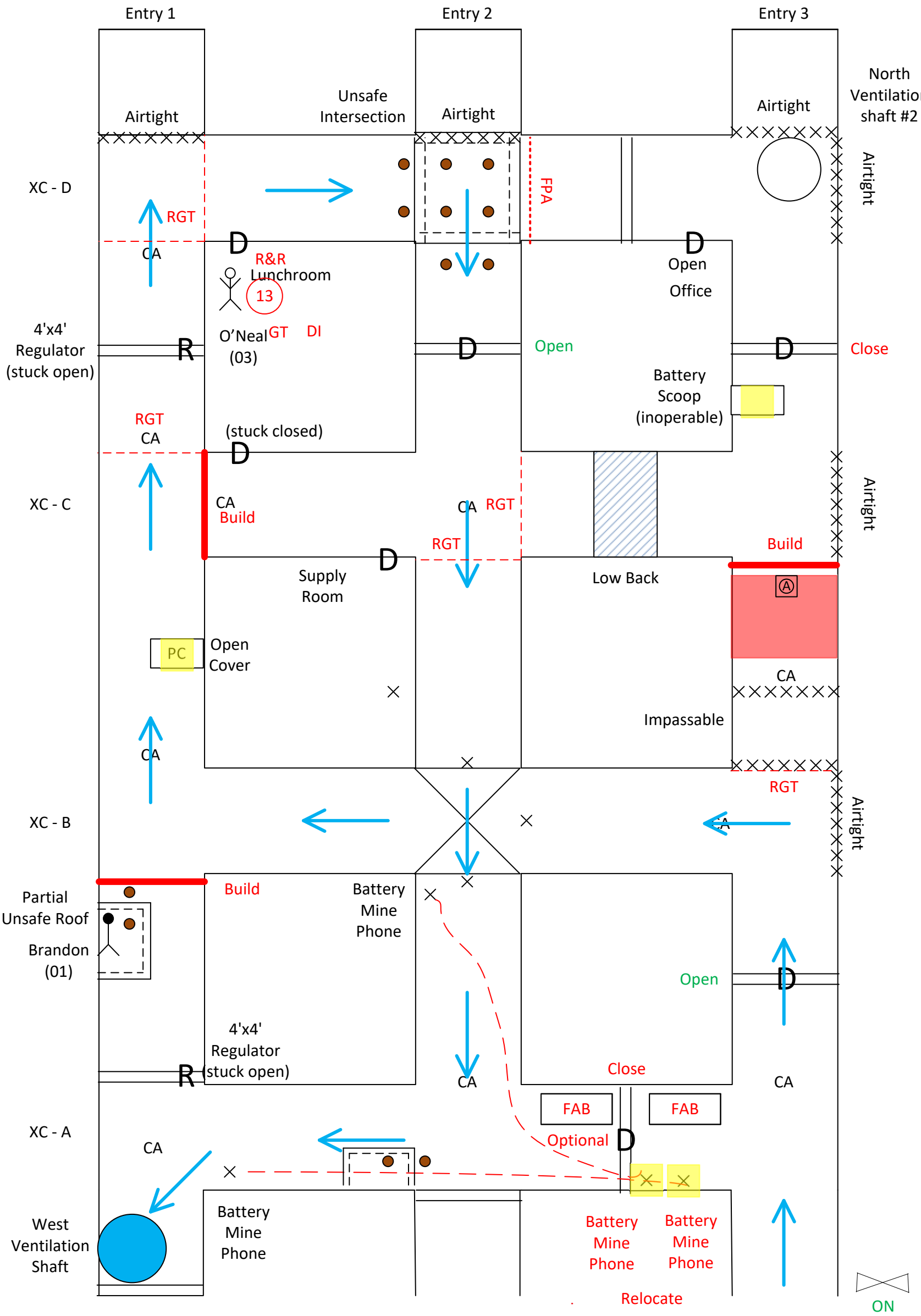
Team Stop #13

The team will enter the lunchroom and identify "O'Neal (03)" the final missing miner. He is not injured and can walk out with the team. The team will bring the miner to the FAB, report their finding, turn in all maps and stop the clock. THE END!

Team Name: _____

Team Draw # _____

Solution Map 6
Ventilation Change 2
Team Stop No. 13



Gas Placard Key

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