

NvMRA Contest 2017

DAY 2

DAY #2 Team Briefing

Thank you for returning to the Shiny Gem mine.

Yesterday you sealed (and eventually extinguished) a fire in our mine, unfortunately we're in serious need for your help again. If you remember, we had water building up inside of the mine. We wanted to pump the water so we could get back in to our working areas, so we sent a four man crew in to set up a new pump, check a fan and check on one pump that was already going. The crew that we sent underground has not reported back & they should have come out over an hour ago.

We think that they got the fan working because we got an SO₂ alarm from the sensors located near the #4 entry portal. The odd part is that the alarm only sounded for 30 minutes and quit. It also seems like the air at the #4 portal quit moving.

We had a report from our toplander who was checking the sump (up here on the surface) that we're pumping the water to from underground. He told me that the pond really stinks and that the water coming from the discharge pipe is down to a trickle.

We have found a little better map than the one we had yesterday and it will be provided to you once you start the clock.

The fresh air base that the second team into the mine yesterday put in place is underground close to where you left off yesterday. Everything that you need to complete your objectives is underground, but if you need something else, please let us know & we'll do what we can. Your back-up team is on site & the authorities haven't left.

Your objectives are:

Find the four missing miners and bring any live miners out

Explore all accessible areas of the mine

Provide information on the conditions within the mine

Good Luck!

Mine Information

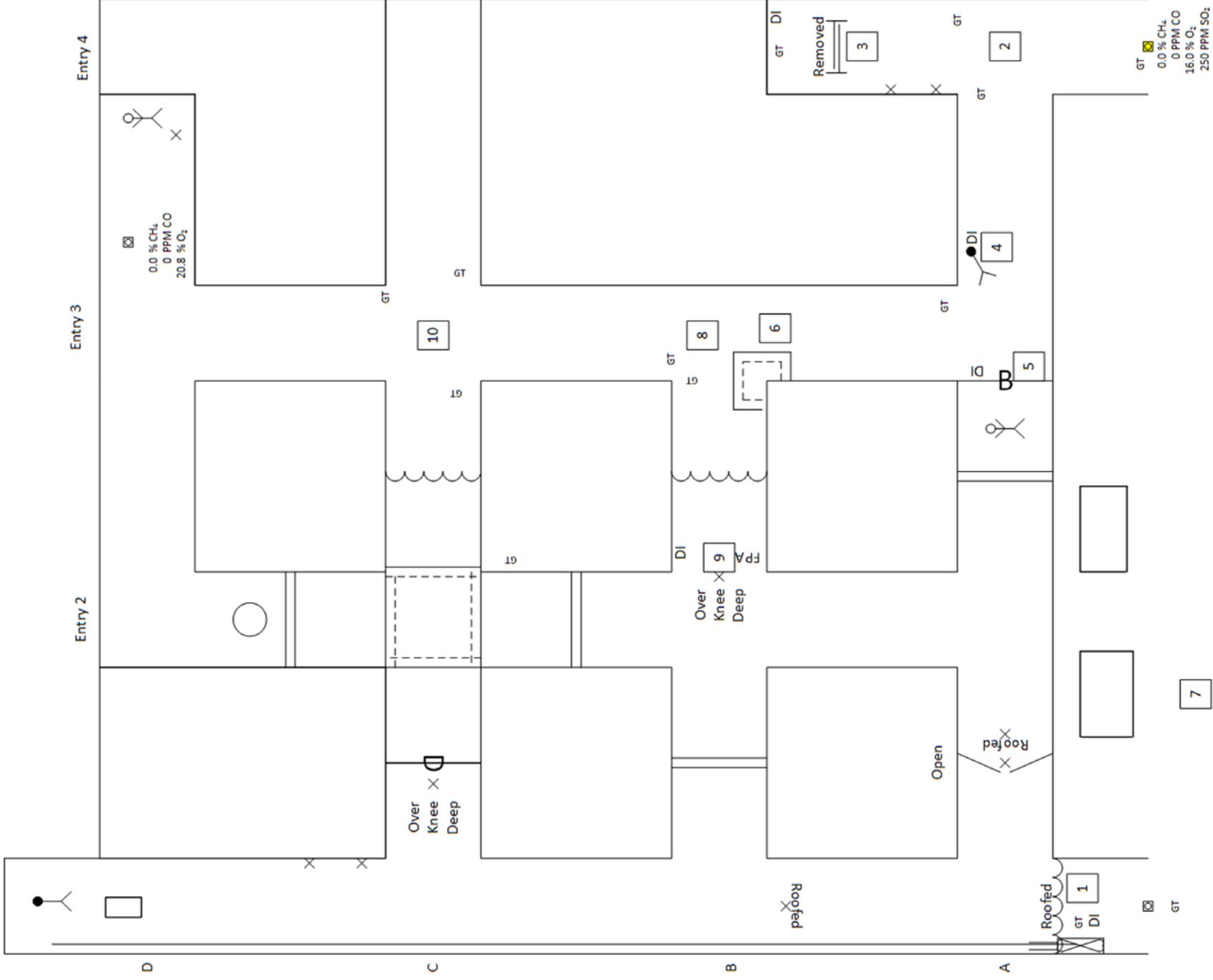
Welcome to the Shiny Gem mine. This is a single-level room & pillar copper mine operated by FBN Mining & Tunneling Services. The mine isn't very old, it's only been in operation for a little over a year. The mine employs 45 people and operates six (6) days a week on 2, 9 hour shifts. Each crew typically consists of 2 miners, a nipper, a toplander, 2 mechanics, one electrician and a foreman. Two crews work on each shift.

- A backup team is on site
- **Explosives** are used underground and stored on the surface. There shouldn't be any to worry about today.
- **UG power:** 4160 volt & it's run underground through the #4 entry portal. Cable carries the power underground to a load center in 4 entry,, #5 XC. Power to the main fan is separate (the fan's on the surface). All power is off, locked out and guarded.
- **Gas:** Once in a while we end up with SO₂, but that hasn't happened in a while.
- Guards have been posted at the borehole (the borehole is way back in #1 entry near #10 XC), main fan and main electrical station.
- **Materials:** Everything available is located in the mine and identified by placards. If you need anything else, ask.
- **Mine Maps:** We're working on it. We canned the engineer when we found out he wasn't one. He did everything on a computer & didn't leave us his password.
- **Mining Method:** Room & pillar. We use Bobcat's to muck and Young Buggies to haul it out.
- **Notification:** All authorities have been notified. MSHA was here when it happened & have issued an order. You HAVE to run everything by them before you do it through the command center.
- **Openings:** #1 entry portal is to the west and #4 entry portal is east. There is a 36" diameter borehole toward the back of the mine. It's surrounded by a fence on top of the hill & is not accessible from here.
- **Phones:** We have several battery powered mine phones, nobody is answering them when we call.
- **Roof support:** You name it, we have it. Most recently we've been having issues with friction stabilizers & have moved timbers underground for use. Some areas the rock is good and we leave it bald headed.

Mine Information - Continued

- **Fire protection:** We normally have hand-held extinguishers located through-out the mine. The fire extinguisher guy is here today, so we'd pulled a bunch out to get them checked. I don't know how many are underground right now. Each piece of equipment should have something to put out a fire on it.
- **Ventilation:** We have three openings, the #1 entry portal, the 36'' borehole are both intakes. Air is exhausted out the #4 entry portal through a 6' Spendrup axial vane (permissible) fan. It pulls around 45,000 cfm out the #4 and is NOT reversible. The borehole is pretty new. It was drilled to increase air flow in the back on the mine. We have a fan for it to be used for a little downcast help, but we need to find someone to help us get it configured and set into place.
- **Water:** We've had a bit of a problem with it over the past week or two. What's coming in has overwhelmed the pumps that we have in the main sump over on the #1 entry side.

Entry 1

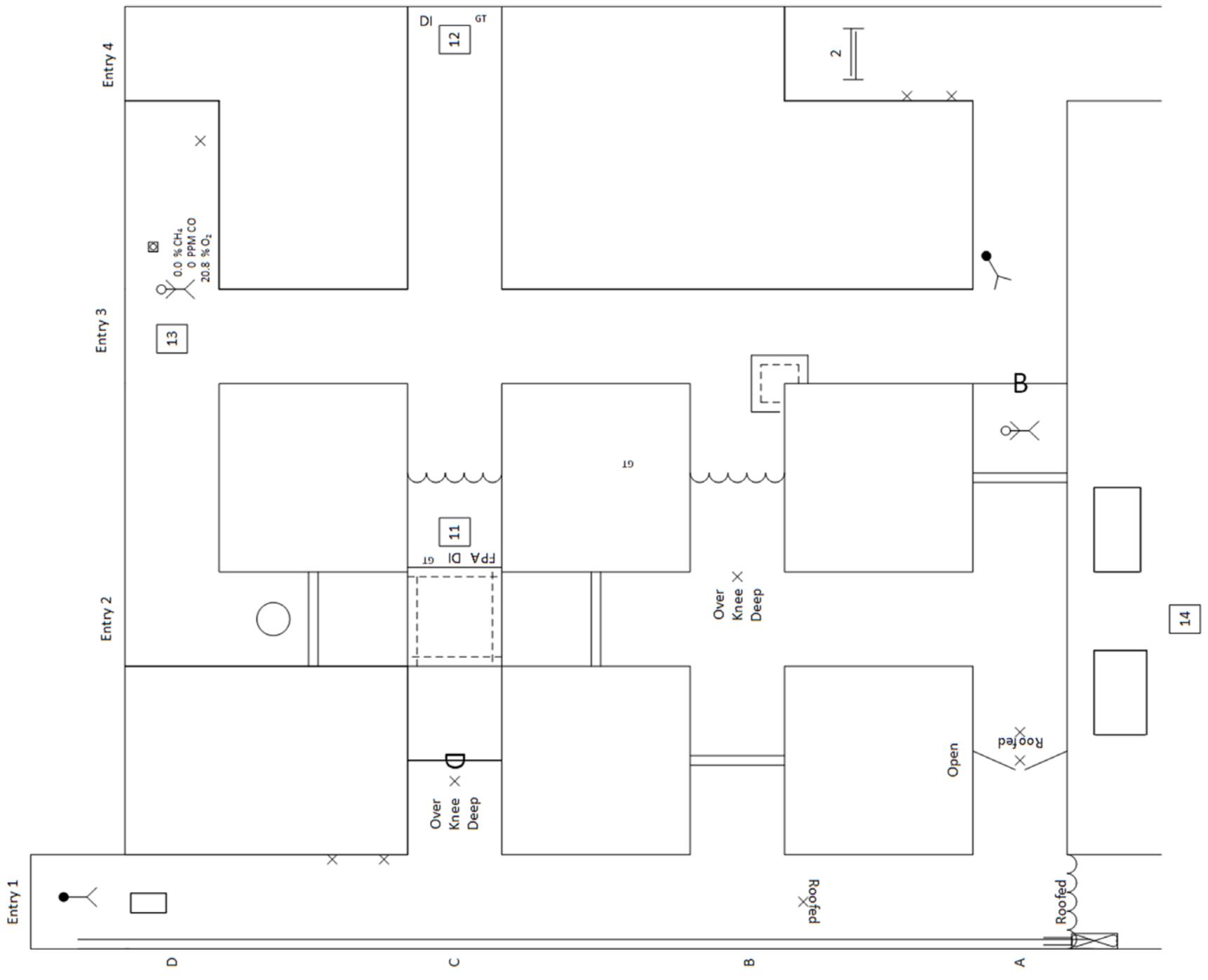


TEAM STOPS 1-10

- Stop #1 - The team can begin exploration on either side. In this scenario we'll start with team stop #1 in Entry #1. The team will encounter a placard on the left showing a fan, a gas placard & a placard showing "Water Roofed". Since the team cannot continue to explore they will have to retreat and enter through Entry #4.
- Stop #2 - At the opening in the field for Entry #4, the team will encounter a gas placard. The placard shows a concentration of SO₂ that will be over the range for the sensors in the MX6 gas detector. The team must simulate taking a gas reading using a stain tube. **PLEASE do not allow a team to break a tube on the field.** The team will advance to the intersection of entry 4 and A-XC. The captain will perform gas tests across both open sides of the crosscut.
- Stop #3 - The team will advance further up entry 4, along the left there will be items to map. Toward the face the team will find four sets of stopping materials. The team can gather and carry two (2) sets with them. The captain will date & initial (D&I) the face and perform a gas test.
- Stop #4 - The team will continue down A-XC toward entry #3. As they near the intersection they will encounter a body near the right rib. The team will stop and perform a primary assessment. After the first-aider has announced that he/she has checked for breathing and a pulse, the #2 judge needs to flip the placard over to show that the miner is not exhibiting signs of life. Before the captain moves the team he should D&I the miner's body.
- Stop #5 - The team will continue traveling into the intersection. A gas test should be made across entry #3. The captain will find a "barricade" placard in the intersection. The captain should knock on the door. When he does this, the #1 judge needs to flip the placard. The B side shows that there is a live miner behind the barricade that desperately wants out. The captain will reassure the miner and D&I the barricade. Since the atmosphere outside the barricade is IDLH the team will have to ventilate in front of the door to bring the miner out. Additionally, the team must aim their further efforts toward extricating this miner.

TEAM STOPS 1-10

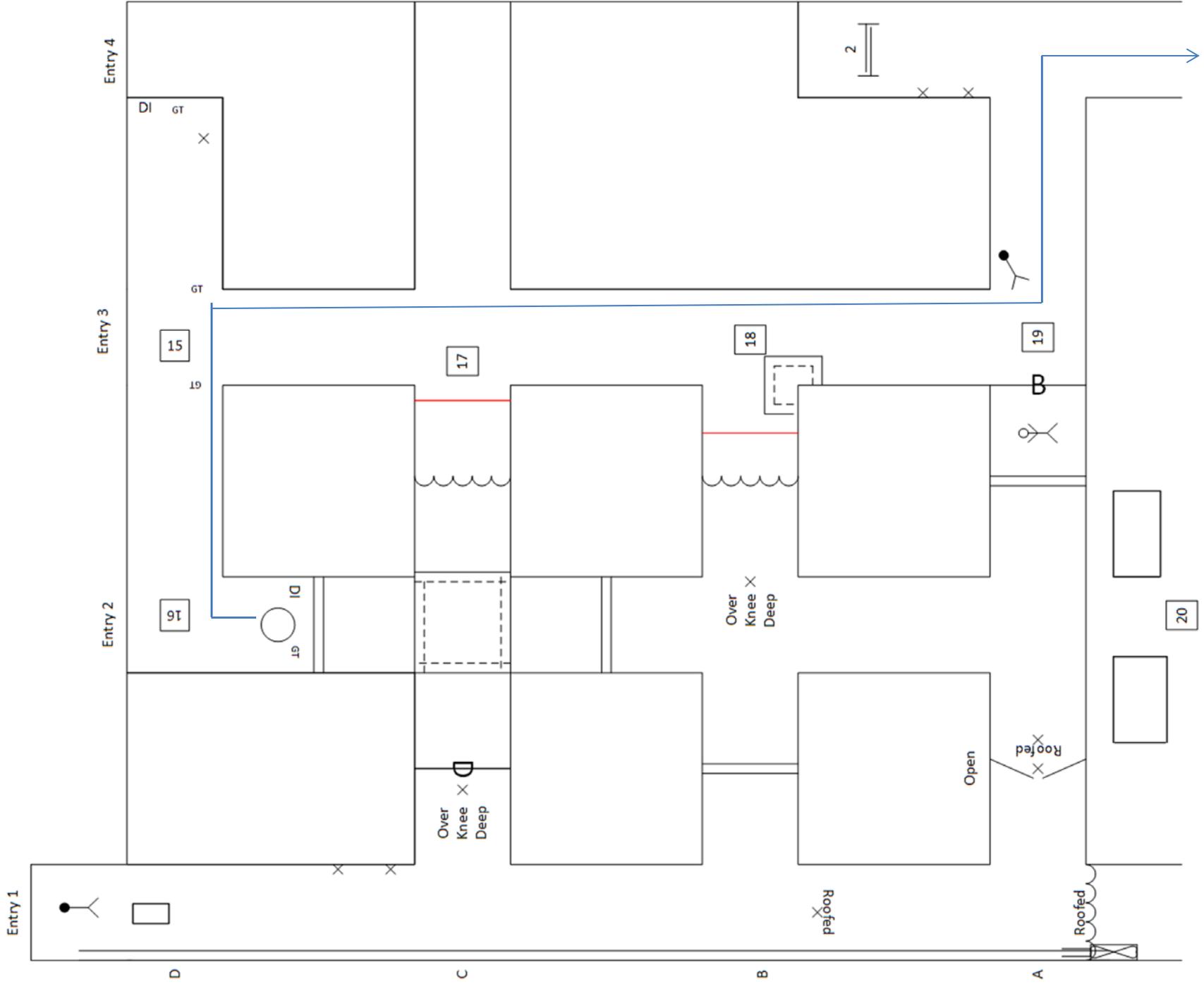
- Stop #6 - The team will advance further up entry #3. As the team approaches the intersection of B-XC and #3 the team will encounter an area of loose rib on the left outby corner. As the captain **breaks the plane of the corner the #1 judge will hand the captain a green card**. This card tells the captain that he is now unconscious. The captain should go to the ground. The team must perform a primary assessment, place him on the stretcher and bring him out of the mine. The side be of the card lets the team know that the captain is conscious & has a pulse.
- Stop #7 - The team will bring the captain out of the mine and turn him/her over to the fresh air base (FAB). We must make every effort to make this transfer as quickly as possible. The assistant at the FAB should take the open position on the team. He/she must be equipped with the same items as the rest of the team and must go under oxygen. The judges should pay close attention and may apply the appropriate surface discounts.
- Stop #8 - The team will travel back into the mine to the entry 3, B-XC. The team needs to perform gas tests across both open sides on the intersection. The team may now travel further into B-XC.
- Stop #9 - Near mid-pillar the team will find a placard showing “water knee deep”. The team can continue without endangering themselves until they reach the next placard that says “water over knee deep.” The captain will need to mark and D&I the furthest point of advance (FPA).
- Stop #10 - The team will retreat back to #3 entry and advance inby to the intersection with C-XC. The team will perform gas tests across the three open sides of the intersection.



TEAM STOPS 11-14

- Stop #11 -** From the intersection of #3 entry C-XC the team can travel either left or right in the XC. In this scenario they will travel left (inby). At about mid-pillar the team will find a placard showing “water knee deep”. The team can continue to travel further inby toward #2 entry. About 10 feet from the water placard they will find another indicating loose roof & ribs. Since the team has not encountered roof supports they cannot travel any further. The captain will D&I the FPA and retreat back out to the 3-C-XC.
- Stop #12 -** The captain will take the team to the right in C-XC. About 15 feet into the drift they will find a “clear air” placard. The captain will stretch to the face, perform a gas test and D&I the face.
- Stop #13 -** The team will retreat back out of C-XC and travel toward D-XC. Once the captain is past the outby corner a person will rush toward the captain & ask to be taken out of the mine. The team will perform a quick assessment of the miner and he will not have any injuries. Since the atmosphere along the path of retreat is IDLH the team must put the miner under air to bring him out. The judges must watch closely to ensure that the team follows the proper procedure for getting a person under air. Once the procedure is complete, the team can take the hoses off of the apparatus and turn the bottle off. The miner must wear the apparatus on the way out of the mine. The team should keep control of the miner. Also, watch to ensure that the persons providing aid to the miner have changed their PPE before touching him/her.
- Stop #14 -** The team will retreat with the miner in tow. They will turn the miner over to the fresh-air base.

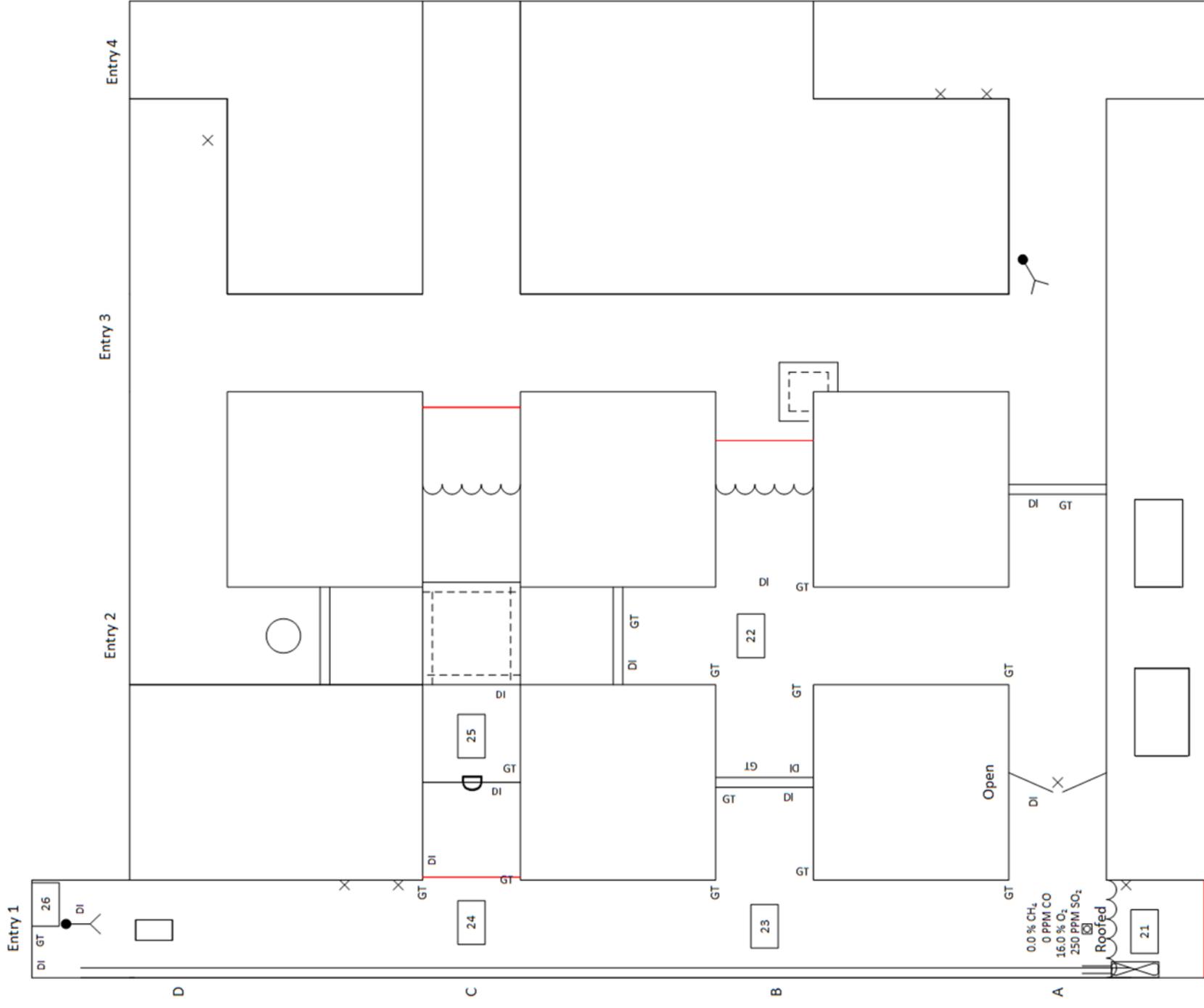
While the team was (by rule) “tied” to the first miner they encountered, the immanency of the second trumped the first & they must take care of him/her. If the team opts to ignore the second miner it will endanger that miner, resulting in the appropriate discounts.



TEAM STOPS 15-20

- Stop #15** - Once the miner has been removed from the mine, the team can return to the D-XC to prepare to ventilate the mine. While in the intersection the team will perform gas test across both open sides. The captain can stretch to the right toward the face. Along the right rib he will find 12 roof supports. He will need to gas test and D&I the face.
- Stop #16** - The team should now head toward entry #2. The captain can stretch to the left where he can explore the borehole, mark D&I and gas test. With this exploration completed the team is now able to ventilate the mine enough to bring the miner behind the barricade out.
- Stop #17** - The team can use one of the stoppings they had picked up earlier to seal inby #3 entry at C-XC.
- Stop #18** - The team can use the second stopping they had picked up to seal inby #3 entry at B-XC.
- Stop #19** - With the openings sealed, air will be forced down entry #3 and out of the mine. The team can call the FAB to have the main fan turned on. Once the call has been made the placards must be immediately turned over to show clear air. The side B of the placard in front of the barricade will indicate that the miner is in a room with 4 walls. Since the air in front of the chamber is clear, they can breach the barricade. The team should do a quick survey and will not find any injuries. The captain should D&I the permanent stopping and do a gas test.
- Stop #20** - The team will have to check air quality along the path of travel as they take the miner out of the mine. Once they get to the FAB they can turn the miner over to authorities there.

There is still one miner missing. There is more than one way to complete the problem.



0.0 % CH₄
 0 PPM CO
 16.0 % O₂
 250 PPM SO₂

Roofed

21

Open

23

22

24

25

Entry 4

Entry 3

Entry 2

Entry 1

D

C

B

A

TEAM STOPS 21-26

As I mentioned in the last slide, there are a couple of ways to solve the rest of the problem. We'll start with the "easy way". The easy way wouldn't have been possible with the 2016 rules.

Stop #21 – In order to explore the mine the team will have to pump water. To do this the team will need to airlock in to #1 entry and start the pump. As soon as they start it, the placards showing water throughout the mine will need to be flipped over...you'll need to enlist the cable helpers to do this. With the water gone the team can advance into the mine. The team will need to gas test across the open sides of the entries as they travel. Most teams will see the open door to the right and go through it. The captain will stretch out and D&I the permanent stopping in A-XC. *Keep in mind that the team needs to airlock or they run the risk of changing ventilation.*

Stop #22 - The team will enter into the intersection on #2 entry, B-XC and tie in. Gas tests will need to be completed across the openings and the stoppings will need to be D&I'ed before the team retreats back to entry #1.

Stop #23 – The team moves inby to B-XC, gas tests across openings and the captain D&I's the stopping.

Stop #24 – The team moves to C-XC, gas tests across opening and checks the closed door. Since the team is uncertain about what lays beyond the door they must airlock to go through it.

Stop #25 - Once the airlock is complete the team can go through it. They can only advance as far as the outside corner and are stopped by loose roof. (Potential to start the "long way" to solve here)

Stop #26 – The team retreats back to #1 entry and continues inby. As they near face they will encounter a piece of machinery and just past that a body. The team must perform a primary survey. The #2 Judge will flip the placard to show that the miner is not showing signs of life & the captain must D&I the body. The team can complete exploration in #1 entry at the face where the captain must D&I the face & a gas test is performed.

TEAM STOPS – Finishing the problem

If the team paid attention to the changes in the rules they are aware that they have found the four missing miners. Technically after stop #26 they are done, can leave the mine and stop the clock. There are others that won't do this and will opt to explore the #2 entry, C-XC. This will cost them time & if it isn't done properly can result in discounts for team endangerment.

To support the roof in this intersection they will need all 12 of the roof supports that they found in D-XC. They must set the posts in accordance with the example shown on page 38 of the rule book.

