

2024 COLORADO REGIONAL
Mine Rescue Contest
LOVELAND, CO

JUDGES' PACKET
Field Competition

DAY1

Mine Information Sheet
Rock Springs Mining Co. #2 Mine

General:

The Wango mining Co. #1 Mine is a new, single-level Class IV underground room and pillar Trona mine. It is owned and operated by Allied Chemical Company. The mine operates Continuous Miner development sections with continuous conveyor haulage. The mine operates 3 eight-hour shifts per day, 7 days per week with two production shifts and one maintenance shift.

Mine Access:

Mine access is provided through two slopes, A main rubber-tired haulage and the second, has a 48-inch conveyor system to transport mined material to the surface. It is generally isolated by stoppings from the main air course.

Pillars are 14 feet by 14 feet, and openings are 9 to 10 feet wide. The typical back height is 8 feet, undulating occasionally.

Ventilation:

The mine is ventilated by a non-reversible, 200,000 CFM Main Fan. The Main Fan is located on the exhaust shaft in 3 Left. Air enters the mine from intake slopes and is coursed through the various sections. All air exhausts through the exhaust shaft. The fan cannot be stopped or reversed.

Mine Classification & Other Mine Gases:

In accordance with Title 30 CFR 57.22003, the mine is classified as Category IV. 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 geological area in which the mine is located.

Electric Power:

Electrical service is provided to the mine from the local electric company. All power in the underground mine has been de-energized but can be energized at switch stations and motor control centers.

Mine Map:

The mine map was last updated July 28, 2024.

Ground/Rib and Roof Control:

The immediate roof, or back, is supported by six-foot fully grouted resin bolts and supplemented with 12-foot cable bolts in the intersections. The mine has a history of ground falls. Timber sets are used as additional supplemental support.

Explosives:

Explosives are used occasionally in this mine. Explosives are stored on the surface. There are no underground magazines located at this mine.

Materials:

All materials to work the problem are located underground or on the surface. Materials needed to complete this problem can be delivered upon request with a time delay to the fresh air base, FAB.

Communications:

Communication is provided by battery mine phones, and the wireless communications and tracking system.

Mining Methods:

The mine is a single-level room and pillar mine. Mining is accomplished with continuous miner and continuous conveyor haulage. The mine is currently in a development mode with no pillar extraction done to date.

Water, Pumps, and Waterlines:

The mine does have a history of water, and our 1000 HP main mine pump is located just off the main haulage.

Notification:

All federal, state, and local officials have been notified. Ambulance service is present and on standby.

Backup Teams:

Two fully trained and fully-equipped mine rescue teams are onsite to back you up.

TEAM BRIEFING

Thank you for responding to our mine emergency.

You are located at the Fresh Air Base that has been established in the 3rd North Development Section. The 3rd North drifts are numbered from left to right 1, 2, and 3. Fresh air is coming into the FAB from the #1 entry side and returning out the #3 side.

A Command Center has been established on the surface, and is in constant communication with the FAB.

3rd shift last week reported intersecting with a feeder in the #1 drift which was found to be liberating high levels of hydrogen sulfide. The hydrogen sulfide had been rendered harmless by the ventilating air course. We are not classified as a gassy mine at this time but have concerns that our mines classification may change due to this recent encounter of high levels of hydrogen sulfide. The mine control center reports that the power to the entire mine knocked last night around midnight. When the miners known to be on the section did not evacuate attempts were made to contact them, no contact was made. The tracking system on the surface is indicating that there are 7 miners on the section. The shift foreman and an examiner attempted to enter the section but encountered high levels of H₂S at the mouth of the section and built temporary stoppings across the three entries.

Power has been re-established to the EXHAUSTING mine fan on the surface and it is running at this time. It is guarded but cannot be reversed or turned off. All power into the mine has been locked out. If power is required to any equipment in the mine, switches will be available at the command center.

Our mine has a history of ground water, hydrogen sulfide, and occasional bad back in areas.

The mine uses battery powered haulage equipment.

All officials and backup teams are present.

The mine map we have for you is up to date.

Another team will be sent into the mine to replace you after 75 minutes.

GOOD LUCK!

Team Instructions

- Explore and map all conditions found and any changes made by the team
- Extinguish or seal any fires.
- Account for the missing miners.
- Bring any live miners to the fresh air base.

Mine Manager/Judge 1 Instructions

Introduce yourself to the team as "Judge 1." Inform the mine that you will serve as the Mine Manager. Then, introduce the #2 Judge. The team has been briefed on the problem and the mine information. Read the following instructions to the team:

At this time, I have no new information for your team. During the working of the problem, I will answer any question that you may have; however, by problem design, my response may be limited in scope. The fresh air base attendant and mine rescue team alternate must remain at the underground fresh air base. If the team returns to the fresh air base, only the attendant or alternate will be allowed to assist them. However, neither the attendant nor the alternate can physically go beyond the fresh air base to assist the team unless he/she becomes a team member when someone drops out.

After the team has completed its 50-foot check, they will not be allowed to physically compare the team map with the fresh air base attendant's map or the team alternate's map. No side-by-side comparison will be allowed.

The fresh air base attendant or team alternate is not allowed to speak with anyone except the team members, or the judges.

At the end of the problem, both the team map and the fresh air base attendant's map will be collected and scored. All map editing must take place prior to stopping the clock. The alternate's map will also be collected at this time, but it will not be scored.

Do you understand these instructions?

When they verify understanding the instructions, have the Team Captain start the clock and hand the team their copies of the Team Briefing Information, the Mine Information Sheets, and the three mine maps.

Field Problem Solution (Team Stops)

DISCLAIMER:

There are many ways to successfully solve this problem. The following outlines one **possible way** for use during MSHA field judges' training.

FAB (XC-0)

The captain introduces his team and remarks "We are here to offer our help. I have a fully equipped, properly trained, and physically fit mine rescue team and we are ready to do anything that you may require in the rescue and recovery work at your mine." The official in charge will reply that they do require the service of mine rescue teams, and that if they are ready, they can be of immediate service.

After mine manager finishes instructions, captain will start the official clock. Captain then writes the month, day, year, and the team position number on the sign-in board (or sheet). The captain's failure to perform any of these tasks will result in discounts (4 x each infraction) per Judge 1 - Surface Rule #8.

Examining Mine Openings

1BC found at the Fab

Captain will perform Roof and Rib (RT) checks at all openings before proceeding into the mine. Gas Tests (GT) will be performed at each opening as well.

Entry 1, 2, and #3 have temporary stoppings and (DI) is required at each, an airlock is required to enter all entries using the BC at the FAB. Captain will most likely airlock into the #2 entry 1st and encounter high levels of H₂S and the outby side of a caved area where a (GT), (RT) and (DI) are required.

RT is Judge 1 - UG Rule #8b DI is Judge 1 - UG Rule #9

GT is Judge 2 - UG Rule #1 (Each gas, Each Omission)

The teams may conduct 50' check at this point or the team will airlock back out of the #2 entry and either airlock into the #1 or the #3 entry.

Stop 1/3: Entering the mine.

The team may enter the mine through Entry 1 or 3. Team must perform 50' check since this is the first team stop in the mine. Airlock required to remove stopping in #1 entry.

Travel inby to Xct.1 Permanent stopping between entry #1 and entry #2. Entry #1 inby XC1, Water over knee deep inby the plane, team retreats and advances to #2 entry.

50' Check is Judge 1 - UG Rule #3

RT is Judge 1 - UG Rule #8b

DI is Judge 1 - UG Rule #9

GT is Judge 2 - UG Rule #1 (Each gas, Each Omission)

Failure to Count off is Judge 1 - Sur Rule #10

Stop 3/1

Airlock in the #3 entry travel inby encounter High levels of H₂S. Water ankle deep inby XC-1. Nothing between 2 & 3 entry.

Stop 2

Inby side of cave 2 entry (DI) (RT) (GT). Stopping between 1 & 2 entry (GT) (DI). Knee deep water "ok to travel" inby on entry #2.

Stop 4/5

Travel 2 entry through the knee-deep water. Overcast walls "no doors" to each side XC-2. Encounter smoke entry 2 inby XC-2. Captain must perform team check and 1 in smoke all in smoke team required to be on the line before captain passes smoke placard.

GT is Judge 2 - UG Rule #1 (Each gas, Each Omission)

RT is Judge 1 - UG Rule #8b

Captain not first is Judge 1 - UG Rule #8c

DI is Judge 1 - UG Rule #9

Enters smoke and is not connected to the lifeline. Rule #10b9.

Teams must be checked immediately before entering smoke Rule #12

Stop 5/4

Nothing to the left in XC-2. Airtight cave inby the plane in #3 entry. RT & DI at the airtight cave. Captain must RT at intersection, GT at each opening: Captain must be first to break the plane of each opening.

Stop 6

Encounter smoke entry 2 inby XC-2. Captain must perform team check and 1 in smoke all in smoke team required to be on the line before captain passes smoke placard. Temporary stopping "not intact" to the left XC-3 DI. Stopping with door to the right "Pump Room" DI. As captain is performing DI response from Pump Room "Help!". Team should not attempt to enter pump room at this time as there is an IDHL atmosphere outside the room and a vent will be required.

Stop 7

Nothing inby. Gas placard outby. Captain must RT at intersection, GT at each opening: Captain must be first to break the plane of each opening.

Stop 8

Captain must RT at intersection, GT at each opening: Captain must be first to break the plane of each opening. Inby side of the Water over knee deep, DI. Line curtain found next to the overcast wall, DI at overcast wall. With line curtain the team now has the necessary supplies to accomplish the first vent and it should be done at this time. (SEE VENT 1) Further exploration delays patient who responded from Pump Room.

Ensure permission for vent change is asked for and given.

Rule 18 f. Judge 1 UG:

Continuing exploration beyond a miner (survivor) who has made verbal contact with the team but is located in an isolated/barricaded area when a means to safely evacuate the miner has been found.

After vent change is completed, flip affected gas placards. Team will have to retest gas at each location that placards were flipped if they pass through these areas.

After ventilating, team will have to airlock into Pump Room. Captain must be the first to breach barricade and do RT and GT inside. Once inside, team will find 1 conscious patient STANDING Wearing an SCSR which is labeled "DEPLETED", and 1 deceased. Person touching patient must have BSI. BSI must be changed between patients. No injuries on the conscious patient. 1st aid man will check patient for any life threats and should notice that the SCSR is labeled "DEPLETED". At that time another respiratory aid should be applied. The captain will DI stopping W/regulator as FPA.

RT is Judge 1 - UG Rule #8b

Captain not first is Judge 1 - UG Rule #Be DI is Judge 1 - UG Rule #9

GT is Judge 2 - UG Rule #1 (Each gas, Each Omission)

RT is Judge 1 - UG Rule #8b DI is Judge 1 - UG Rule #9

Failing to take BSI is Judge 1 - UG Rule #10a

Touching Patient without clean BSI is Judge 1 - UG Rule #18 GT is Judge 2 - UG Rule #1 (Each gas, Each Omission) Airlock is Judge 2 - UG Rule #9

Judge 2-UG Rule #14

14. To properly protect a survivor, a team must provide an approved 4-hour oxygen breathing apparatus and/or an approved 1-hour oxygen-generating unit. If a survivor is unconscious, an approved oxygen breathing apparatus equipped with a full face-piece must be used. However, if a survivor is found and is wearing an approved 1 hour oxygen-generating self-contained self-rescue (SCSR) device, the team will not be required to replace it with one of the above mentioned units unless the SCSR has been depleted.

The team will now retreat out to the FAB and turn over the patient. Watch for gas checks at all the cleared gas placards.

Team will advance inby. Watch for gas checks at all the cleared gas placards.

Stop 9

Team encounters H₂S feeder with explosive levels of Hydrogen Sulfide in intersection RT, GT. Water is Roofed on the plain RT, GT, DI @ water roofed. Gas placard on the plain XC-4 no longer explosive. Stopping not intact between #1 and #2 entry DI. Battery golf cart XC-4.

Stop 10

Captain must RT at intersection, GT at each opening: Captain must be first to break the plane of each opening. Gas placard in intersection. Inby side of unsafe roof in #2 entry RT, DI. Barricade in #2 face DI. XC-4 nothing.

Stop 11

Captain must RT at intersection, GT at each opening: Captain must be first to break the plane of each opening. Water Roofed on the plain RT, GT, DI. Gas placard in intersection. #3entry outby smoke between XC-3 & XC-4. Team check and all members on the lifeline required prior to entering smoke.

Stop 12

Captain must RT at intersection, GT at each opening: Captain must be first to break the plane of each opening. Back of stopping W/Regulator in XC-3 DI. Inby side of airtight cave #3entry DI, RT. End of smoke at airtight cave.

Teams can now vent the Barricade (SEE VENT 2).

Ensure team requests vent change and it is granted prior to clearing smoke and gasses.

After ventilating, team will have to airlock into barricade. Captain must be the first to breach barricade and do RT and GT inside. Once inside, team will find 1 unconscious patient. Person touching patient must have BSI. BSI must be changed between patients. Life threatening bleeding on right forearm. Team will treat the life threatening bleeding according to first aid rules. The captain will DI Face as FPA.

RT is Judge 1 - UG Rule #8b

Captain not first is Judge 1 - UG Rule #8b DI is Judge 1 - UG Rule #9

GT is Judge 2 - UG Rule #1 (Each gas, Each Omission)

RT is Judge 1 - UG Rule #8b DI is Judge 1 - UG Rule #9

Failing to take BSI is Judge 1 - UG Rule #10a

Touching Patient without clean BSI is Judge 1 - UG Rule #18 GT is Judge 2 - UG Rule #1 (Each gas, Each Omission) Airlock is Judge 2 - UG Rule #9

Judge 2-UG Rule #14

14. To properly protect a survivor, a team must provide an approved 4-hour oxygen breathing apparatus and/or an approved 1-hour oxygen-generating unit. If a survivor is unconscious, an approved oxygen breathing apparatus equipped with a full face-piece must be used. However, if a survivor is found and is wearing an approved 1 hour oxygen-generating self-contained self-rescue (SCSR) device, the team will not be required to replace it with one of the above mentioned units unless the SCSR has been depleted.

The team will now retreat out to the FAB and turn over the patient. Watch for gas checks at all the cleared gas placards.

When they do this, the captain can state that the team has completed its mission. The captain will then stop the clock.

End of Problem

#1 Judge will quickly walk the field with the team captain and write in the final location of the ventilation controls on the map titled Final Vent Control Location Map. After this, have the captain sign the map. This will be used to compare the working map with the final condition.

5-minute Look

Inform team of any infractions that have occurred. This should be brief. This is to discuss what infractions they incurred, not how many docks they will be assessed.

**** THE END****