



Correspondence

May 27, 1910
to
October 20, 1925

Palos Mine

Memorandum for draft of letter

Mr. Drennen,
President, Palos Coal & Coke Co.,
C/o Drennen & Co.,
Dry Goods Merchants,
Birmingham, Alabama.

Not sent
7/27
8-33

Dear Sir:

The condition of the Palos Mine has been brought to my attention by our mining engineer Mr. G. S. Rice. It is his understanding that your operating department proposes resumption of the work as soon as permission from the State Inspector is obtained.

It is not my purpose to in any way reflect upon the State Inspection Department or in any way make public the conditions, but I desire to bring to your attention some certain features which I regard as very serious and require remedying before operations are resumed.

Mr. Rice and Mr. Rutledge in their investigations up to and including Tuesday of this week found that the area between the fourth right and sixth right entry is not being ventilated sufficiently although the fan is said to be running at about its normal speed and other conditions are about as they have been in the past. They found that this large area was pervaded throughout by gas sufficient

to obtain a "cap" in Wolf's safety lamp of from one-fourth to one-half inch, thus indicating from one to three per cent of methane throughout the area in question, and that at the face near feeders gas in explosive quantities would be found.

These Points ^{at the face} were not tested inasmuch as it would have been extremely dangerous to have placed safety lamps ~~with~~ there although the *was* feeders could be heard.

It is needless to say that this constitutes a tremendous danger as a naked lamp igniting gas at the face would start an explosion which supplemented by the large amount of fine coal dust throughout the mine would cause a repetition of the former disaster. Even if safety lamps are used there would still be danger as such lamps have a limit in the presence of an explosive mixture. Moreover, the permissible explosives while tested in the presence of a certain amount of methane and dust will not prevent ignition when in the presence of an explosive mixture as they are not intended to be used under such conditions. Further, more or less dynamite ~~is~~ used in your mine in shooting down rock between the layers of coal or what is termed the "middle man." Sticks of dynamite were found in several

places in the mine. Dynamite will cause ignition of either gas or coal dust. With these things in view it is almost needless to say that I consider the conditions extremely dangerous.

I believe from what Mr. Rice says that you have a good fire boss in your Mr. Steve O'Brien although he did not at first recognize the very faintly colored "cap" ^{that had} which showed this "cap" having a different appearance from what he had been used to.

In this connection, Mr. Rice brings my attention that your safety lamps, mostly of the Clanny type, are neither suited for work in gas mixtures nor are they in good condition. The few Wolf lamps which you have are also in very bad condition.

Taking all these conditions into account it is the opinion of Mr. Rice that it will be unsafe to resume work until a material change has been made in the area in question. It is his opinion, ~~that~~ after careful examination of the whole mine and a review of the evidence, that the explosion originated in one of the rooms in the Sixth Right and was probably due to an ignited lamp having ~~been~~ set off the gas which may or may not have resulted from a fall of rock. Such falls

could

are liable to recur at any time and particularly at the present when the roof has been shaken by the explosion.

He suggests that conditions might be improved by setting up the second fan which you now have at hand in the adjacent or parallel opening to the one from which the present fan draws and have both of them worked together. Second, below the **Second Right Entry**, and possibly below the **First Right**, to carry the intake air both down the main slope and the air course by arranging the brattices suitably and use both these entries and the intake as far as the **Sixth Right**, then split the air leading one half at once through the **Sixth Right** and thence through the open rooms to the **Fourth Right** thence through the other open rooms to the **Second Right** and if there is connection to the **First Right** through such rooms on to the **First Right** whence it would return ~~to~~ ^{through} the air course to the two fans.

The other split of the air would pass down to the **Seventh Right** thence to the face of the **Main Slope** and up through the old rooms to the **Fifth Left** and from there up through other old rooms to the **Third** and then to the **Second**. From there it would pass by the overcast which already exists over the **Main Slope** to the air

course joining the other return split and thence to the fans. This would form the mine into two main splits instead of one as at present. It would, moreover, furnish fresh air and in larger quantity to the area where most needed between the Sixth Right and the Fourth Right. With this system on the left side there could be further slitting of air if it seemed desirable. The

The expense involved in this would be the setting up of the new fan which should be done in any case and as that one is in first class condition it would give you one fan to go on in case of a breakdown or shut down for temporary repairs; and the expense of repairing the overcast which has not been used for some time, and the expense of putting up a number of doors.

To supplement this the slope from the mouth to a point below the overcast should be widened so as to lessen the friction of the air in the present small passage and which is further restricted when a trip of cars is passing through same.

In our opinion this plan is entirely feasible and would not take a long time to carry out. In the opinion of our mining engineers should be done except the widening of the slope before the mine resumes

operations. The widening of the slope could be carried on during operations on the night shift.

I would suggest that if you are not satisfied that the conditions reported by our mining engineers are as bad as they indicate or that their remedy is not on good lines, you call privately a commission of the other operators to examine the mine and see what should be done. We have no doubt that ~~it~~^{they} will be glad to render this service, inasmuch as the miners of the district have generally been rendered uneasy and they will undoubtedly be glad to do anything that can be done to restore confidence. As stated previously, this letter is entirely confidential and you need not fear that publicity will be given from our side.

Very respectfully,

Chief technologist.

ANALYSES OF SAMPLES OF AIR AND DUST
 PALOS MINE, PALOS COAL & COKE CO., PALOS, ALA.
 MAY 15, 1910.

(Sampled by J. J. Rutledge)

Con- tainer: No.	Lab. No.	Location of sample	Material	Analysis				Quantity of air
				CO ₂	O ₂	CH ₄	H ₂	
8673	10524	Return air at fan 9 am	Air	0.12	20.50	0.43	78.95	30,000
8672	10523	Return air at fan 4 pm	Air	0.05	20.50	0.45	79.00	30,000
8671	10522	6th Right 5-16-10	Air	0.30	20.10	1.96	77.64	?

MINE DUST SAMPLES (As received).

				H ₂ O; Vol. % F.C.; Ash :			
20229	10510	Palos mine	Road dust	3.98	24.78	60.52	10.72
20229	10511	do.	Dust	4.42	25.60	59.29	12.69
Bottle	10564	do.	Dust	4.19	15.25	62.59	19.99
20217	10567	do.	Coked dust	1.56	18.20	62.62	17.62
20225	10569	do.	Coke	2.95	17.67	65.62	15.78
20240	10571	do.	Coke	2.44	18.46	61.73	17.37
20254	10572	do.	Coke, road dust	2.52	16.04	67.08	14.36

*Abstracted
9/27/15*

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	H ₂ O	Vol. F	F.C.	Ash	
20229 10510 Palos mine 5-20-10	Road dust	3.98	24.78	60.52	10.72
20339 10511 do. 5-18-10	Dust	4.42	23.60	59.29	12.69
Bottle 10564 do. 5-9-10	Dust	4.19	13.23	62.59	19.99
20317 10567 do. May 1910	Coked dust	1.56	18.20	62.62	17.62
20333 10569 do. 5-18-10	Coke	2.93	17.67	65.62	13.78
20348 10571 do. 5-18-10	Coke	2.44	18.46	61.73	17.37
20354 10572 do. 5-20-10	Coke, road dust	2.52	16.04	67.08	14.36

Palos Mine Explosion
May 5, 1910
Palos Coal & Coke Co.
Palos, Alabama.

CASE: PALOS MINE.

In this mine on May 5, 1910, an explosion occurred resulting in the loss of 83 men inside and one man on the outside of the mine and doing much damage to the underground equipment.

The mine near Palos, Jefferson Co., Alabama, is developed in the Mary Lee coal bed which averages from 5 to 6 feet in thickness and contains a hard shale parting of 1 to 1-1/2 inches near the center. This coal is bituminous, coking, high volatile and belongs geologically in the Mary Lee group, Carboniferous Age, Pottsville Formation. An analysis on the received basis is as follows: Moisture 2.69, volatile matter 25.95, fixed carbon 64.16, ash 7.22, sulphur 0.61.

The coal is mined by pick and is blasted with permissible explosives, but dynamite is used for brushing the roof and for breaking the "middleman" when it is thick. The coal is hard and makes large lumps. At the time of the explosion the mine had seven pairs of right hand entries and six lefts and the advance workings were near the limits of the property lines.

The main entrance to the mine consists of a slope driven in rock, and immediately in front of the slope is the Warrior river which is bridged for the transportation of the mine cars to the tippie across the river.

E.K. GOR, July 10, 1925

The haulage within the mine is done by animals which deliver the cars to a tail rope system which hauls the coal to the outside and to the tippie.

Gas and ventilation:

The workings of the mine liberate explosive gas, methane, and where ventilation is not properly conducted there are accumulations of the gas.

The ventilation of the mine is produced by a mechanically operated fan, exhausting, located at the entrance of one of a pair of entries on the outcrop of the coal. The ventilating current at the time of the explosion was continuous throughout the entire mine.

Moisture:

The main slope which was driven through rock was wet throughout but the mine was dry except for a few local weeps along the main entries. Throughout the mine dry, fine coal dust was much in evidence.

Lighting:

The miners used open flame lamps and the only safety lamps used were those carried by the fire boss which lamps were key locked.

Electricity:

No electric power wires were used in the mine.

Explosion hazard:

Explosive gas, inadequate ventilation, dry fine coal dust, open flame lamps and the use of dynamite, all contribute to conditions favorable to an explosion.

Investigation:

Engineers of the Government reached the scene of this explo-

sion within 2 or 3 hours after its occurrence and were later joined by rescue crews and additional engineers who assisted in the recovery work and the investigation of the mine. In an examination of the mine and noting the action of the explosion, it was observed that the flame of the explosion came out of the main slope and extended to the middle of the bridge over the Warrior river, blistering the paint and setting fire to wooden guard rails on the bridge; that a mail messenger was caught on the bridge and so severely burned that he died shortly and that the mail bag carried by the messenger was partly consumed.

Immediately over the slope entrance was the track of the Southern Railway, supported by heavy sawed timber, and on the outby exposure of these there was found crusts of coked coal dust.

The slope was found to be wet from near its entrance to the foot, but no evidence of heat, charred or coked coal dust, and at the foot of the slope a body was found having a heavy growth of hair, but no evidence of any burning of the hair, clothes or body.

The greater majority of bodies found showed evidence of burns but some gave no such evidence.

In the region embraced along and between the 4th right and 6th right entries there was much evidence of heat in the form of charred and coked dust, and in this region was found the presence of accumulated gas. After the ventilation had been restored as it originally traveled in the mine, it was found that gas was present in the mine atmosphere in this region to the extent of 1 to 3 per cent, and at some unventilated faces the gas was present in explosive proportion.

Origin of explosion:

The conditions found as indication of forces, the presence of charred or coked dust and its position, all indicated that the explosion had originated in the region of the 6th right entry through the ignition of a body of gas and that the presence of dry coal dust propagated the explosion throughout the mine and added to the violence of the initial explosion. An open flame lamp was the most probable source of the gas ignition.

Lessons to be learned from this explosion:

1. That in a mine liberating as, as this was, open flame ^{not} lights should/be used.
2. That more than two splits of the air current should be provided in order to prevent the return from one gassy section being the intake for another section.
3. That a long wet slope through rock does not prevent the passage of the flame of a coal dust explosion where there is a large amount of dry coal dust in parts of the mine adjacent to the wet zone.
4. Under condition 3 there may not be found signs of burning or coked dust through the wet zone, yet there were masses of thick coked dust on the timbers of a railroad trestle crossing over the mouth of the rock slope. The thick coke was on the outby sides of the timber but none on the sides facing the slope.
5. That in a strong flaming coal dust explosion, the flame does not always extend to the floor or walls, as was evidenced by a body found near the foot of the slope having no hairs burned.

F. M. DEBENHAW, President.
E. E. DEBENHAW, Supt.
JAMES MAGOWAN, Mine foreman.

Approved *W. W. Paul* July 10, 1925

Compiled by J. W. Paul,
July 1, 1925.

*Thinking and notes on
in accordance with
notes and records
W. W. Paul*

GWR/ACS

7177

Pittsburgh, Pa., May 27, 1910.

Dr. J. A. Holmes,

Thru Engineer in Charge

Washington, D.C.

My dear Doctor Holmes:

As a memorandum of our conversation, I wish you would send me the blue print plan of the Palos Mine at your earliest convenience.

Yours very truly,

Mining Engineer.

